Insights from a New Division of the Self-employed: Analysis of Characteristics, Earnings Returns and Labour Market Transitions using the BHPS and UKHLS

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Abstract

This thesis examines self-employed individuals in the UK labour market, creating a new division that differentiates those who sustain by self-employment from those who move between self-employment and employee jobs. The thesis begins with an exploration of the characteristics of the different self-employed groups, compared to employees; then estimates earnings returns to human capital accumulation for the different groups; and scrutinises labour market transitions before and after the 2008 financial crisis, to see if the recession impacted behaviours.

The analysis begins by establishing the criteria for partition between the self-employed, based on observation of the labour market behaviours of workers in our sample. We use an amalgamated dataset, the British Household Panel Survey, from the years 1991 till 2008, and its successor the United Kingdom Longitudinal Study, from years 2010 till 2014, following the same respondents in the UK for 23 years. We identify three categories of workers: those who we consider as 'sustaining' in self-employment; those who 'dabble' in self-employment [switching between self-employment and employee jobs] and those who are employees.

The first empirical chapter sets out the criteria for the categorisation of individuals into sustained and dabbled self-employed and employees and describes the motivation for this additional distinction – not least the fact that most labour market studies consider 'employees' and 'the self-employed' as separate and distinct categories of worker. In this first chapter, we compare the characteristics of individuals in our two categories of self-employed with those of employees in our sample, using a Multinomial Logit Model. The analysis lends support to our categorisation of the two sets of self-employed workers. The sustained self-employed have characteristics that we more traditionally associate with the self-employed, for instance they are older, more male-oriented, non-white, non-UK born, and non-English native speakers. In

contrast, those who we consider as dabbling in self-employment exhibit a unique set of attributes that place them in a distinct position when compared to both the sustaining self-employed and employees. They are found to be more advantaged than the wage earners, with respect to their observed socio-economic characteristics; not from ethnic minority groups, more male-oriented, UK nationals, native English speakers, middle-aged group of workers with good health status, reporting higher degrees of achievement and working in higher skilled industries. Also, they are more skilled than the sustained self-employed, with respect to their qualifications and skill levels, but are not well embedded in self-employment like the latter group. Sustainers are better off with respect to their home ownership, report higher work satisfaction, have fewer working partners, with a higher percentage of previously self-employed parents.

What we expected to find was that dabblers were a disadvantaged group, pushed into self-employment because they cannot have access to paid employment, but what we found was that their movement between forms of self-employed and employee jobs seems to reflect a labour market 'power' of sorts and not a deficiency. They can move between forms of employment depending on the returns they perceive and are pulled rather than pushed. Hence, this does not fit with our original expectations and does not align with the disadvantage theory on which we base the formulation of our hypotheses. This implies that we have a sequential of highly professional and advantaged portfolio workers possibly making the best out of self-employment and paid employment jobs as they arise.

The second empirical chapter estimates the returns to formal education for the 'amalgamated' group of self-employed and paid employees, without considering any heterogeneity within or among this group of workers in our data. We then estimate the returns for our categorisation and compare the results. We use the Log-Mincerian function to estimate the earnings returns for our workers, and the Ordinary Least Square model, Random Effect model, Fixed Effect model and Instrumental Variable techniques to interpret the results, and to

deal with the potential endogeneity of education. We also employ the Heckman selection model to account for non-random selection into employment.

The results from the [preferred] Fixed Effect model indicate that the returns for additional years of education are lower for the dabbled self-employed in comparison to paid employees. Similar findings are also shown when using credentials, although in both cases dabblers report a higher number of years of education and higher levels of educational attainments than paid workers. This validates with our own hypothesis, where we argue that dabblers are not able to enjoy higher returns to their human capital accumulation than paid employees, because they are unable to secure or ensure long term paid employment. Hence their lower returns to formal education might be explained by their oscillating pattern between paid employment and self-employment. Another possible explanation is that their agile way of working does not help us truly capture their earnings returns and for that reason the aggregate returns are shown to be lower.

Moving towards the sustained self-employed, we could not find any robust evidence about higher returns in comparison to the dabbled self-employed and the always employed, although the estimates found lead towards this direction but do not hold any significant values. Hence, we could not validate our own hypothesis, based on the extension of the personal control theory, where we argue that sustainers should enjoy higher returns than dabblers because they have more planning advantages, continue longer in self-employment and are more established than dabblers. Also, sustainers should enjoy higher returns than paid employees because they are not bound by organisational rules since they are their own boss, they have more control over their own work and better use of their personal human capital. Furthermore, we could not detect any differences in the earnings returns between the general/amalgamated group of self-employed and paid employees, whereas our categorisation showed that the two

subgroups of self-employed are different from each other and from paid workers, with respect to their observed socio-economic and demographic characteristics and their earnings returns. Although our results do not show any differences in the returns of the sustained self-employed, the returns for our dabblers seem to be lower, even though they are on average more advantaged. Hence, at the very least, we have found a group of workers not previously identified in studies that seem to suffer from some form of labour market disadvantage, when we consider their returns to education and account for the selectivity in occupational choice and endogenous problems of education. By doing so, we have contributed to new micro-econometric evidence on the heterogeneity of earnings returns to education for the self-employed in the UK labour market and offered a new comparable type of heterogeneity in the labour market that can be looked through in other studies and established in other countries.

The third and last empirical chapter of this study looks at the transitions of workers in our sample, prior to and after the economic downturn and impact of the 2008 financial crisis on the behaviour of our division groups. This chapter explores the short and long-term trends in self-employment in the UK labour market, the changes in the nature of jobs and the demand and supply of workers in the market, the growth in self-employment in the UK labour market following the recession and the policies adapted as a response to the crisis. The aim is to find out if the transition behaviour of our workers helps us explain the overall changes in growth in self-employment that occurred in recent years within the UK labour market.

Because the analysis here is descriptive and exploratory in nature, no specific hypotheses were tested. However, our main focus is on the flow of the dabbled self-employed in the UK labour market and their response to economic shocks because they have proven to be unique in their dabbling patterns, their socio-economic and demographic characteristics and earnings returns to formal education. We may find that dabblers are simply younger versions of those who become sustained self-employed, or that they control a sequential portfolio of

working people, who are possibly making the most of self-employment and paid employment jobs, when time and conditions allow them to do so.

Our findings reveal that our data does not explicitly show the rise in self-employment after the economic downturn. This is because the rise might be attributed to new labour market entrants that our study is unable to depict, since we are bound by observing the same number of people over certain period of time. However, the transitions show that our group of workers behave differently in the labour market. We notice a fall in the sustained self-employed in self-employment, but more persistence for the dabbled self-employed, even during recession, and we detect a new entry from the always employed in self-employment, especially after the economic downturn. Hence, our results show that the sustained self-employed do not seem to be as well embedded in self-employment as we might expect them to be. As for the dabbled self-employed, they seem to show greater propensity towards paid employment, but still have higher persistence in self-employment than the sustained self-employed. We could think at first that their rise in self-employment is just a temporary state to find secure wage employment, but their higher persistence after the economic downturn, even with their lower returns reveals that these workers have intentionally chosen to be in self-employment and are the younger and more established version of sustainers in the labour market. Also, the rise in their years of education over time implies that these workers have opted out of the labour market to advance their education - this can possibly explain why they have lower earnings returns. As for the entry of employees into self-employment, we witness again the rising of a new dabbling form, but we would attribute this to push and negative effects linked to the effect of the recession.
Overall, our study captures a new contemporary form of work in a more refined manner than the simple employment versus self-employment dichotomy and that falls into the grey area between these two labour market states. We provide key insights into a group who have not been separately identified in the labour market to date. We offer a better proximity that presents

the actual scene in the labour market, provide new micro-econometric evidence on the heterogeneity of returns in self-employment and we raise awareness of policy makers on this unique dabbling form of work.

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Declaration

I declare that all the material contained in this thesis is my own work.

Hiba Hussein

Chapter 1- Introduction

A distinction between the self-employed and those who work as employees is at the heart of many key labour market debates. Studies of the unemployed question whether self-employment is an easily accessible route into the labour market or an insecure dead end (Carrasco, 1999; Taylor, 2004; Meager, 2007; Urwin, 2011; Urwin and Buscha, 2012). Many ethnic minority groups and recent immigrant communities have pronounced levels of self-employment (Clark and Drinkwater, 2000; Lofstrom, 2002; Andrea and Robert, 2004; Parker, 2004; Constant and Zimmermann, 2006; Dawson *et al.*, 2009; Startiene˙ *et al.*, 2010; Goetz and Rupasingha, 2013; Eurostat, 2014); and these debates reflect wider questions of whether the self-employed are 'pushed' or 'pulled' into self-employment (Manser and Picot, 1999; Ritsila and Tervo, 2002; Moore and Muler, 2002; Hughes, 2003; Georgellis *et al*., 2005; Dawson *et al.*, 2009; Dawson and Henley, 2012; Deane, 2016).

The growth in self-employment during the economic downturn has added further fuel to these debates. There has been a clear increase in self-employment rates in the UK that is slightly idiosyncratic at an international level in recent years and opposite to the EU countries in table 1.1 below. Especially after the 2008 financial crisis, the self-employed constitute 15 percent of total employment in 2014, compared to 13 percent in 2008 (ONS, 2014). More than 630,000 workers became self-employed between the second quarters of 2007 and 2014 in table 1.1 below, constituting the highest increase among EU counties, where most countries witnessed a decline in the number of self-employed workers after the recession (Eurostat, 2018|). The increase accounted for 81 percent of the total net changes in employment during that period in the UK labour market (Ashworth *et al.*, 2014; D'Arcy and Gardiner, 2014 p:9), with many suggesting a 'push' into self-employment (Ashworth *et al.*, 2014; D'Arcy and Gardiner, 2014 p:9; ONS, 2013, 2014; Hatfield, 2015 p:3). In contrast, the link that many make between self-employment, small businesses and entrepreneurship sees this form of working as

a fundamental driver of long-term growth and emphasises the 'pull' of being one's own boss (Dawson *et al.*, 2009; EEOR, 2010; Kelley *et al.*, 2013 p:2; Deane, 2016). This raises a concern whether the recent rise of self-employment after the economic downturn is an indicator of a strong market recovery, a sign of "entrepreneurial spirit, innovation and future economic growth" or an indicator of a rise of "precarious and insecure work" (Hatfield, 2015 p:3). Hence, anticipating changes in the labour market is a key feature of policy in most modern economies. Where the current labour market in the UK is more diverse in terms of people working as self-employed, in part-time work, or in zero-hour contracts, it is implied that the UK has a more lightly regulated labour market than other Western European countries.

Table 1.1: Number of self-employed across the European Countries before (second quarter, year 2007) and after the recession (second quarter, year 2014).

European Union Countries	Q2 2007	Q2 2014
Belgium	552,700	601,800
Bulgaria	350,300	333,300
Czech Repblic	744,800	831,900
Denmark	228,700	218,400
Germany	3,867,300	3,821,800
Estonia	60,500	50,000
Ireland	311,900	276,700
Greece	1,275,900	1,057,200
Spain	3,297,400	2,849,900
France	2,585,200	2,824,000
Croatia	291,200	213,700
Italy	5,349,300	4,814,400
Cyprus	63,500	55,100
Latvia	92,300	96,000
Lithuania	185,900	137,900
Luxembourg	12,600	20,000
Hungary	459,400	425,400
Malta	21,800	24,100
Netherlands	998,400	1,220,500
Austria	430,400	438,000
Poland	2,808,700	2,750,300
Portugal	903,300	679,500
Romania	1,678,600	1,531,100
Slovenia	98,200	114,100
Slovakia	293,200	355,700
Finland	292,000	299,300
Sweden	432,000	414,300
United Kingdom	3,544,800	4,179,600
European Union	31,230,300	30,634,000

Source: Eurostat Labour Market Database (Eurostat 2018)

Swinford (2014) hypothesises that high levels of self-employment rates are a sign of an increase in entrepreneurial spirit, as workers who lost their jobs and set up their businesses during recession have shown resilience to the poor labour market conditions by showing innovative and creative skills that lead to the economy's growth. Oppositely, Clark (2014a) expresses his concern that not all self-employed workers have chosen this path voluntarily and some have been forced to go it alone with no desire to sustain in the job market, due to the absence of alternative paid jobs. Barnes (2013) and Clark (2014b) claimed that the unemployed

are being pressured to enter self-employment so as to be scratched out of job centre statistics, with many tending to enter it for the sake of accessing tax credit and not because of their own desire to become self-employed (D'Arcy and Gardiner, 2014). Also, staff members were being encouraged by employers to become self-employed to enable the employer to avoid any tax or employment responsibilities (Hatfield, 2015). Thus, the increase does not entail much of the reasoning and motives behind why people choose to enter self-employment. This creates debate on the implication of the high levels of self-employment rates in an economy, since the triggers to enter such work are still ambiguous and as is its direct contribution.

This is an especially concerning matter when looking at the UK economy, which is characterised by its unusual structure that favours self-employment entry on one side and limits the growth of the business on the other (Meager, 2007). This is done by implementing policies that stimulate incentives for individuals to enter self-employment, but at the same time enforcing barriers to limit their growth and expansion (Urwin, 2011). The sets of existing policies are regarded as an artificial 'pull factor' to self-employment without employees, but at the same time as a 'push factor' for business owners wanting to take on additional workers (Urwin, 2011; Urwin and Buscha, 2012). However, these policies do not considerably help to expose the reasons why workers engage in this type of employment.

In all of this, a simple dichotomous distinction is often made between the self-employed and employees. However, in addition to the rise in self-employment during the current recession, there is a suggestion that long-term structural changes to the labour market are making this form of working more important, as we see the rise of individuals with 'portfolio careers, hybrid workers and a growing importance of freelancers, especially with the emergence of the gig economy (Kalleberg, 2009, 2011; ILO, 2015; Solesvik, 2017). This has raised further questions about what it really means to be self-employed, as the main theoretical problem is the divide and the distinction between paid employment and self-employment.

Hence, the self-employment landscape in the UK needs to be more simplified and clearer, since this lack of clarity creates confusion between work, workers, academics and policy makers.

The concept of self-employment is ambiguous because of the different classifications and descriptions by authors, workers themselves and legal authorities (Taylor, 2004; Startienė *et al.*, 2010). There still exists no unified legal description of the self-employed across countries. Measurement problems occur when establishing cross-country comparisons due to countries' individualities and how people classify themselves and are classified as self-employed (Startienė *et al.*, 2010). Self-employment is an important aspect in the labour market because it is considered a driver for job creation in Europe and a positive contribution to the UK economy (EEOR, 2010; Deane, 2016). It is associated with entrepreneurship and economic growth (Schumpeter, 1934). It represents a pathway into work for the unemployed, inactive workers, and newcomers. It maintains workers longer in the labour force, allows them to choose the skills they want, and the means and time for their work. It keeps them productive, generates income and decreases their dependence on public aid and programmes (Blanchflower, 2000; Giandrea *et al.*, 2008; Urwin and Buscha, 2012). Thus, it creates more job opportunities, provides a wider array of services and innovative activities to the market, reduces unemployment rates and poverty and increases per capita income within a country (Parker and Johson, 1996; Aschroft and Love, 1996; Williams, 2002; Fritsch and Muller, 2004; Van Stel *et al.*, 2005; Audretsch, 2007; Van Praag and Versloot, 2007; Thurik *et al.*, 2008; Urwin and Buscha, 2012). However, self-employment is only an aspect of entrepreneurship and cannot capture the whole level of innovation and the size of economic growth (Glaeser *et al.*, 2010). Also, self-employment has no barrier to entry, whereby workers can supply their skills in the market without having to pass any entrance exams, interviews etc., when joining a firm and supplying skills to the market via that firm, as an employee. Obviously, making a living as self-employed is another challenge, but in the first instance, we may expect more

disadvantages amongst the self-employed who cannot access employee jobs and are hence pushed into self-employment.

Many studies have tried to estimate the determinants for switching to self-employment by using cross-sectional studies, such as the work of Evans and Leighton (1989), Meyer (1990b), Blanchflower and Oswald (1991a) and Taylor (1996). Others had the advantage of closely examining the key features of self-employment using longitudinal studies and checking the transitions in and out of self-employment, with a focus on the flow from unemployment into self-employment (like the work of Carrasco (1999); Taylor (1999); Martinez-Granado (2002); Henley (2004); Taylor (2004) and Meager (2007)). But the drawback of previous research is that it treated all self-employed as one cluster of workers, a single ideal type with a stable set of individual attributes (Carroll and Mosakowski, 1987; Douglas and Shepherd, 2000; Meager, 2007), whereas workers are heterogeneous in their own attributes and choose to enter self-employment for different reasons. Some are positively motivated, pulled, and driven by opportunity, whilst others are negatively motivated, pushed and engaged by necessity rather than choice (Levesque *et al.*, 2002; Dawson *et al.*, 2009).

The increasing importance of these factors has resulted in studies (e.g. Block and Sandner, 2009; Block and Wagner, 2010; Dawson and Henley, 2012; Fossen and Buttner, 2013) that developed finer distinctions of the self-employed in an attempt to shed light on heterogeneity and the various labour market debates, such as the difference between the self-employed and entrepreneurs in Blanchflower's (2000, 2004) work and Van der Sluis *et al.* (2008), the extension of the 'push' and 'pull' literature for entrepreneurs by Dawson and Henley (2012), the difference between necessity and opportunity entrepreneurs by Block and Sandner (2009), Block and Wagner (2010), and Fossen and Buttner (2013), the distinction between self-employed with and without employees by Urwin (2011), and Urwin and Buscha (2012) and the notion of hybrid entrepreneurs by Solesvik (2017).

But these studies miss out on an important aspect of the dynamics, the potential for a distinct group of individuals to be cycling between self-employed and employee jobs, when compared to those who sustain in self-employment or employee jobs. This is particularly evident in a labour market where there is increasing discussion of 'portfolio' workers and the 'gig' economy, and the situation of such workers is of key interest to policymakers. None of these studies makes a distinction that is particularly apparent from our data (the BHPS and UKHLS), which is that many individuals (80.32%) remained as employees all of their working lives during the 23 years we observed them, from 1990 till 2014, with the missing year 2009, and of those who have at least one spell of self-employment, approximately 9.83% remain in this state and 9.85% can be considered on the margins of being self-employed/employee (University of Essex. Institute for Social and Economic Research, 2010; University of Essex. Institute for Social and Economic Research, NatCen Social Research and Kantar Public, 2017).

Thus, the self-employed are viewed as a stock measure that has a strong dynamic/churn aspect. It contains workers who are temporarily in that 'state', moving in and out, whilst others are more attached and continue to engage in self-employment activities. With this unclear peculiarity between the two, there are also problems when computing earnings returns to human capital, where the returns do not entail on the true value that one can expect from being self-employed and one can expect from being a paid employee. Much of the initial technical discussion in this thesis focuses on how one uses a large panel (BHPS/UKHLS) to categorise individuals into self-employed *Sustainers* and self-employed *Dabblers*, as well as those who 'sustain' a status as employee.

However, whichever specific dissection is implemented, the analysis in this thesis sheds important new light on the nature of self-employment in the UK and the growth that occurred over recent decades, to help understand the role of self-employed in the economy. Our study contributes to a new categorisation of self-employed that falls into the grey area between self-

employment and paid employment. It captures a new contemporary form of work in more refined manner than the simple employment versus self-employment dichotomy and represents the actual scene in the labour market, based on our own observation of workers in the UK labour market. Our thesis provides key insights into a group who have not been separately identified in the labour market to date, the self-employed *Dabblers,* and focuses on the issue of their security and longevity in this type of employment. It fills the gaps in previously established divisions in self-employment, with respect to the socio-economic and demographic characteristics of workers, where we find substantial differences not only between self-employed and employees, but for *Dabblers*, who exhibit different characteristics to other workers. This thesis provides new microeconometric evidence on the heterogeneity of returns in self-employment and between paid employment, while exploring new approaches to deal with the endogeneity problem of education and the non-random selection into work choice. Again, we find the earnings returns for years of education for the group of dabblers to be distinct from other workers. Hence, this study raises the awareness of policy makers to help them understand changes in the world of work and the unique dabbling form of work to help ensure the relevant regulations and policies are in place for all workers' whatever form of work they engage in.

The first empirical chapter of this thesis sets out the differing characteristics of *Employees*, *Sustainers* and *Dabblers*. It focuses on establishing consistent division criteria for the self-employed by using a combination of surveys: the British Household Panel Survey(BHPS) which interviewed UK respondents from 1991 until 2008; and its successor, the United Kingdom Household Longitudinal Study (UKHLS), following the same members throughout an extended period, from 2010 to 2014, for a total of twenty-three years (University of Essex. Institute for Social and Economic Research, 2010; University of Essex. Institute for Social and Economic Research, NatCen Social Research and Kantar Public, 2017). We

differentiate between workers who we observe moving in and out of self-employment and who are at the margin between self-employment and paid employment, as self-employed dabblers, and workers who we observe enduring for a longer time in self-employment, as sustained self-employed. We identify the division criteria for these two subgroups of self-employed and compare with workers who we see only engaging in paid employment during their total employment time, and who we label as always employees. In this chapter, we explain tentatively how the division is established and the rationale behind it, while exploring the variations in the observed socio-economic and demographic characteristics between workers.

This chapter is very exploratory in nature, as 'a priori' it is unclear whether those on the margins of self-employment (*Dabbler*s) will have characteristics that are more closely aligned with employees or the self-employed. If we find that dabblers are particularly disadvantaged in terms of occupation, income, ethnicity and other characteristics, the suggestion would seem to be that they oscillate between these two labour market states because they are unable to sustain one or other forms of working and perhaps simply reflect a more general lack of 'employment' or 'labour market' security. If we see a more advantaged group; according to key characteristics, the implication is that we have a group who control a sequential portfolio of working people, potentially making the most of self-employment and employee jobs opportunities as they arise. This chapter therefore sheds new light on several important academic and policy debates, arising from the creation of a new distinction amongst the self-employed.

An important contribution of the first chapter of the thesis is the identification of a significant group of '*Dabblers*' who have quite distinct characteristics when compared to both employees and those who sustain in self-employment. In addition, such a group has the potential to shed light on a key issue in the literature regarding the earnings returns to self-employment.

The estimation of earning returns between the self-employed and paid employees is also problematic, as the self-employed are self-selected in ways that are [potentially] unobservable and they are often different in observable characteristics, motivation, reasons for choice of work and control over their human capital (Van der Sluis and Van Praag, 2004, 2007; Van der Sluis *et al.*, 2008; Benz and Frey, 2008; Douhan and Van Praag, 2009; Van Praag *et al*., 2009; Van Praag *et al*., 2013). In such situations, the comparison of returns would lead to biased estimates due to the [potentially unobservable] inter- and intra- differences within workers in self-employment and between paid employment, rather than providing insight into the different returns that an individual can expect from being self-employed, compared to being a paid employee (Ashenfelter, Harmon and Oosterbeek, 1999; Harmon, Oosterbeek and Walker, 2003, Shane, 2006; Dickson and Harmon, 2011; Henderson, Polacheck and Wang, 2011). This results in disparity in the literature on the magnitude of returns to human capital for employees and self-employed. The evidence in the UK is diverse and varies significantly, depending on the dataset and empirical methodology used (Williams, 2003), and does not offer any kind of comparison with other studies (Parker and Van Praag, 2006), with the main difficulties arising in measuring self-employed income and how persons classify themselves and are classified as self-employed.

The second analytical chapter of this thesis begins one of its major contributions by extending the work of researchers who investigate the returns to education amongst the self-employed, like the work of Block and Wagner (2010) and Fossen and Buttner (2013) on necessity and opportunity entrepreneurs and basing the notion on self-employed sustainers and dabblers, linking with the 'push' and 'pull' model and extended personal control theory. This chapter addresses the endogeneity problem of education and the self-selection bias problem within occupation choice. However, we believe that whilst there are methods available to accommodate non-random selection into the various labour market states, across which we

wish to compare the earnings returns, identifying a group of individuals who are on the margins of being self-employed or employees provides us with a group who are (necessarily) selective into both states. Thus, sequentially capturing their returns to education, and comparing this to those for employees and those who sustain in self-employment, allows us to add significantly to understanding in this area. Accordingly, using an amalgamated (BHPS/UKHLS) panel data, incorporating Instrumental Variable approaches and allowing for non-random selection into these labour market states, further strengthens the contribution of this chapter.

We expect different returns to education for our division groups, due to the viewed differences with respect to the observed socio-economic and demographic characteristics, the type of work and the time spent in work, all proposing different levels of control and use of own human capital. Hence, we argue that the sustained self-employed should enjoy higher returns because they have more control over their own work and better use of their personal human capital than employees, whereby these latter are bound by organisational rules and constraints. Also, we consider the sustained self-employed to be more established and have more planning advantages than the dabbled self-employed who, with their agile way of working in self-employment and inability to neither secure nor ensure for long in paid employment, are placed in a disadvantaged position compared to self-employed sustainers and wage earners. Hence, at the very least we identify the returns for a new group of workers (the dabblers) not previously identified in studies and contribute to new microeconometric evidence on the heterogeneity of earnings returns to education for the self-employed in the UK labour market, in addition to offering a new comparable type of distinction in the labour market that can be looked through in other studies and established in other countries.

The third and final analytical chapter of this thesis analyses separately the categories of self-employed and employees, before, and after the recession in 2008. Essentially, the first analytical chapter uses the periods between years 1991 and 2014 to categorise and explore the

characteristics of dabblers, sustainers and employees (as this is the full period in which we can observe our respondents in the combined BHPS and UKHLS sample), and the second analytical chapter estimates the earnings returns to education for this period. In this final chapter, we create categories of dabblers, sustainers and employees according to the data prior to 2008, and then consider the extent to which we see those who were employees, sustainers and dabblers prior to recession, change their behaviours after the recession. We study the impact of the recession on our group of workers and look at the short and long-term structural changes over time. Did recession promote employees to 'dabbling' or did some 'sustain' self-employment? Or did the dabblers simply increase the amount of time spent in self-employment after the recession?

Measures of the labour market that register a rise or fall in self-employment are taken at a point in time and registered for each group. The aim of this chapter is to study the transition behaviour of our workers to help us explain the overall changes in growth in self-employment which occurred during recent years in the UK labour market. The analysis here is mainly descriptive, where we focus on the flow in and out of self-employment after the economic downturn. Thus, we may find that dabblers are simply younger versions of those who become sustained self-employed – in this way, one can see this work as being in line with Urwin and Buscha (2012), who use LFS data to analyse the 'entrepreneurial pipeline' (where do the self-employed come from?) and with the ONS's (2014) study, which suggests that the rise in self-employment during the economic downturn is mainly due to longer duration of workers in self-employment. Or we may find that dabblers control a sequential portfolio of working people, who are possibly making the most of self-employment and paid employment jobs when time and conditions allow them to do so, or possibly 'trying out' both types of employment to see what best suits their skills. In addition, we may witness the rise of new dabbling patterns among employees. Overall, we provide key insights into a group who have not been separately

identified in the labour market to date, we offer a better proximity on the behaviour of workers in the labour market prior to and after the economic downturn, and we raise awareness of policy makers on this dabbling form of work, with the most challenging factor looking at the issue of their security and longevity to help support effective labour government policy.

1.1 Aims and Objectives

Many labour market studies implicitly consider 'the self-employed' as distinct from 'employees'. This study attempts to create a new consistent division of the self-employed, who cycle between these two states. The initial investigation asks whether it is possible to identify a distinct group of 'dabblers' who have a range of characteristics that set them apart from those who sustain in self-employment or in employee jobs? There are two main competing *a priori* hypotheses in this respect:

- Hypothesis 1: Dabblers (if they exist as a distinct group) are potentially more disadvantaged, as they cycle between 'insecure' employee jobs and self-employment.
- Hypothesis 2: Dabblers have some amount of advantage, as they can move between self-employment and employee jobs, simply responding to the highest returns and making the best out of each employment type in response to specific economic conditions and time.

It is unclear whether we have a group of workers who suffer from some form of labour market disadvantage that push them into self-employment because they cannot access nor able to endure in paid employment. This is in line with Weber's (1930) disadvantaged theory and Light's (1972) cultural theory that considers workers to be pushed into self-employment because they are misfits, have fewer advantaged attributes; are members of an ethnic minority, experience language barriers, face poor credit access and have cultural and customs avoidance. Also, this relates to the literature on the definitions of self-employed, and the push and necessity

of entrepreneurs (Spence and Gomez, 2004; Block and Wagner, 2010; Dawson and Henley, 2012), whereby the former represents the simplest types of entrepreneurs who do not necessary innovate but only bear income risk, are not able to capture the whole level of innovation and the size of economic growth of the firm and are pushed to become entrepreneurs out of inevitability and negative factors (Block and Wagner, 2010; Glaeser *et al*., 2010). Or, we have a group of workers who control a sequential portfolio of working people, making the best out of employment and self-employment jobs as they rise, hence they are pulled rather than pushed. Their movement between forms of self-employed and employee jobs reflects a market of a 'sort' and not a deficiency, depending on the returns they perceive and the preferred labour market conditions at different points in time. We link this to the notion of hybrid entrepreneurs by Solesvik (2017) that combines both paid and self-employment jobs together, where we see this form of work more popular among highly educated professionals in knowledge-intensive and innovative industries (Folta *et al*., 2010; Petrova, 2012).

Our aim in this study is to clarify our thoughts on this agile way of working and to explain the reasons behind this dabbling pattern. We aim to create a new consistent division that reflects the actual scene in the labour market, to contribute to new microeconometric evidence on the characteristics, earnings return to education, and transition behaviours for the self-employed. We stress a new type of heterogeneity (the self-employed dabblers) that has still not been identified in the labour market to date, to help explain the overall changes in the growth in self-employment that occurred during recent years within the UK labour market, affected by the long-term structural changes of workers and the onset of the recession, to raise awareness of policy makers on this dabbling form of work and to offer new comparable types of distinction that can be looked through and established in other studies and countries.

Thus, in this PhD thesis, we aim to answer the following research questions:

1. What are the respective socio-economic and demographic characteristics for self-employed sustainers, self-employed dabblers and paid employees? Do the dabblers have characteristics more aligned with self-employment or with paid employment?
2. What are the respective earnings returns to formal education for our three groups of workers? Which group enjoys higher earnings returns to Human Capital?
3. How did the economic recession (2008) impact the transition behaviours of our three categories of workers? Can this provide insights into the growth in self-employment and new forms of working?

1.2 Research Structure

The thesis is structured as follows: Chapter 2 represents a review of the general literature, where we focus on the definitions and divisions with respect to self-employment, the characteristics of self-employed, the theories that explain the reasons behind why individuals choose this type of employment over paid employment, and the factors that influence the work choice. We also revise the theories that emerged to explain the reasons why people invest in formal education, and how the returns differ for self-employed and paid workers. In Chapter 3, we attentively explain and show how the division is established and the rationale behind it. Furthermore, we point out the important characteristics that we wish to explore for our division of workers, and we use the Multinomial Logit Model and computed marginal effect estimates to identify the propensity characteristics for our group of workers and compare the results. Chapter 4 follows up the work and estimates the earnings returns to human capital for our division, using the semi-log Mincerian earnings' regression. It also accounts for the endogeneity problem of education via Instrumental Variable techniques and the non-random selection into occupational choice via the Heckman selection model. Furthermore, in this

chapter, we focus on the economic theories that explain the returns to Human Capital and the heterogeneity of returns within the self-employed and between paid workers. Then in Chapter 5, the third empirical chapter, we explore the short and long-term trends in self-employment in the UK labour market throughout the years, look at the changes in jobs and demand and supply of workers, examine the structure of the UK economy, the onset of the 2008 financial crisis on the labour market, the policies adopted in response to the crisis, look at the flow of our workers in and out of self-employment during that time and compare our results with the Office of National Statistics findings. Finally, in the last chapter, Chapter 6, we provide the summary of our work, contribution, research implications, limitations and suggestions for future work.

Chapter 2: Literature

2.1 Introduction

This chapter examines the self-employed, the definitions, the divisions created, the characteristics of workers, the role of education and the factors that affect the choice making decision for this type employment. The first part of this chapter focuses on the self-employment theories that emerged to try to explain the reasons behind why individuals choose to enter self-employment in contrast to paid employment. These theories concentrate on the sociological-psychological theories that determine the non-financial motives for the self-employed, and the economic theories that deal with the financial motives behind the choice of work. Specifically, we look at the effect of the 'push' and 'pull' theories and the disadvantaged theory on the entry mode into self-employment. We then examine the role of education for the self-employed. We look at the human capital model introduced by Becker (1964) which regards education as a productivity enhancement tool and as an individual investment good that ensures future positive marginal returns. Also, we discuss the signalling and screening hypothesis by Spence (1973) that considers education as a signalling tool for unobservable characteristics to employers, rather than accounting for any development in the human capital. And we review the aspect of the personal control theory (Douhan and Van Praag, 2009) that argues why entrepreneurs should enjoy higher returns to human capital than wage earners. Following this, the second and final part of this chapter focuses on the important definitions and divisions with regards to self-employment.

2.2 Push and Pull Model

The 'Push' and 'Pull' model (Amit and Mueller, 1995; Johansson, 2000; Parker, 2004; Carey *et al.*, 2007; Muehlberger, 2007; Dawson *et al.*, 2009) looks at the effect of external and uncontrolled forces behind why individuals choose to enter self-employment. The pull factors

are characterised as positive motives and reasons, while the push factors are considered as negative ones.

2.2.1 Pull Factors

The former is stronger when the labour market is in better economic condition, when individuals perceive self-employment as an opportunity for occupational betterment. Where it provides the benefits of personal autonomy and financial profits that are unavailable in regular paid jobs (Carrasco, 1999; Dawson *et al.*, 2009). Hence, workers decide to enter self-employment knowing that other job prospects (e.g. paid work) are also available for them to engage in.

The 'pull' motives dominate entrepreneurial activities for both men and women, where entrepreneurs are much more likely to engage in innovative jobs and to have an impact on the macro-economic performance (Gilad and Levine, 1986; Dennis, 1996; Segal *et al.*, 2005; Van Stel *et al.*, 2005; Thurik *et al.*, 2008; Fossen and Buttner, 2013).

2.2.2 Push Factors

Push factors are more evident with negative and unfavourable market conditions; when workers are forced to be in self-employment because no other work alternative is available. The negative forces are characterised by periods of economic crisis, high levels of unemployment rates, high entry barriers in the wage sector, limited paid job offers, discrimination between workers, language difficulties, ignorance of customs and the increasing level of poverty (Light, 1980; Evans and Leighton, 1989; Steinmetz and Wright, 1989; Devine, 1994; Carrasco, 1999; Clark and Drinkwater, 2000; Moore and Mueller, 2002; Dawson and Henley, 2012).

The 'push' motives comprise self-employment involvedness, where workers only practice conventional tasks, and consider this type of work as a last resort due to the high

barriers of entry in paid employment, with lengthy spells spent in unemployment (Gilad and Levine, 1986; Cowling and Mitchell, 1997; Segal *et al.*, 2005).

2.2.3 Evidence from the literature

Workers in the UK indicate positive reasons when engaging in self-employment (Manser and Picot, 1999; Deane, 2016). Findings by Dawson *et al.* (2009), using time series data from the United Kingdom Quarterly Labour Force Survey, between the years 1999 and 2001, show that most workers decide to become self-employed for positive reasons and not much evidence supports the pushed self-employed. These results are debatable as the period of the investigation was characterised by a sustained economic growth and low unemployment rates at 6 percent. Hence, we would expect the findings to change when the economy experiences severe economic downturn. Evidence also showed that deprived and unsatisfied wage employees, the unemployed, workers with long inactive spells, persons who lose their jobs involuntarily and are not able to collect their benefits are more likely to be pushed to become self-employed (e.g. Moore and Muller (2002) in the case of Canada; Georgellis *et al.* (2005) in the case of the UK).

Most aggregate economic-level studies address the importance of the push and pull theories by examining the relationship between self-employment and unemployment, where it is shown to be negative when there is a 'prosperity-pull' relationship, and positive when there is a 'recession-led relationship' (Dawson *et al.*, 2009; Dawson and Henley, 2012 p:700).

2.2.4. Propensity Pull Hypothesis

The 'prosperity-pull' hypothesis suggests that individuals are more willing to start their own company when the economy is expanding, unemployment rates are low, and income is growing (Muehlberger, 2007; Dawson *et al.*, 2009), because high levels of unemployment rates decrease the demand for self-employed products, lower income, jeopardise business survival and increase the risk of bankruptcy (Evans and Leighton, 1989; Blanchflower and Meyer, 1994;

Parker, 2004; Dawson *et al.*, 2009). Thus, "workers' decisions to enter self-employment reduce unemployment rates at the macro level" (Thurik *et al.*, 2008, p:674) and positively influence the country's economic performance (Nickell *et al.*, 1997; Acs and Audretsch, 2003; Van Stel *et al.*, 2005).

2.2.5. Recession-led Hypothesis

The 'recession-led/push hypothesis', also referred to as the 'refugee effect or the dispersion effect' implies a positive correlation between unemployment and self-employment activities and a negative association with economic development (Acs *et al.*, 1994; Thurik *et al.*, 2008 p:674). Here the high levels of unemployment rates decrease the opportunities of having paid jobs and the opportunity costs for new business start-ups (Blau, 1987; Evans and Jovanovic, 1989; Evans and Leighton, 1990; Blanchflower and Meyer, 1994). This makes self-employment a better alternative than unemployment and paid employment (Oxenfeldt, 1943), where workers are pushed to set up their own work because they perceive that the pecuniary and non-pecuniary returns are more attractive for the time being. However, this increases self-employment transitions but suppresses entrepreneurial activities (Storey, 1982; Storey and Johnson, 1987; Ritsila and Tervo, 2002; Dawson *et al.*, 2009).

2.2.6. Evidence from the Literature

At a macro level, a positive association is found between self-employment and unemployment (e.g. Storey and Johnson (1987) for the case of UK; Evans and Leighton (1989) for the case of US). At the same time an inverse relationship exists between the two (e.g. Blanchflower and Oswald, 1990 & 1998; Taylor, 1996; Acs *et al.*, 1994; Thurik *et al.*, 2008).

Nearly all cross-sectional studies support the propensity-pull hypothesis (Hughes, 2003; Dawson *et al.*, 2009). Black *et al.* (1996), Cowling and Mitchell (1997) and Robson (1998) found a positive association between housing price and self-employment engagement, where results are consistent with the propensity-pull hypothesis, whereas time-series data suggests

the presence of both effects in the market, with most studies supporting a positive association between self-employment and unemployment (Parker, 2004).

The high levels of unemployment act as catalyst for the unemployed and increase their entry into self-employment, supporting the recession-led hypothesis (e.g. Storey and Johnson (1987) for the case of the UK; Evans and Leighton (1989) for the US; Hamilton (1989) and Bogenhold Staber (1991) for European and US countries; Schuetze (2000) for evidence on North American men). The unfavourable market conditions, the expected financial returns and non-pecuniary benefits from self-employment become more attractive, and therefore individuals are pushed into self-employment out of necessity, instead of spending long inactive spells out of the labour market (Storey, 1982; Storey and Johnson, 1987, Carrasco, 1999; Dawson *et al.*, 2009).

Parker (2009) suggests that the prosperity-pull effects outweigh the recession-push effects, whereby people are drawn into self-employment when unemployment rates are low. This indicates that the market for goods and services is active (Thurik *et al.*, 2008). Thus, individuals enter self-employment because they want to and not because they should (e.g. Dennis (1996) for evidence from the US). Similarly, evidence from the UK in Blanchflower and Oswald's (1990 & 1998) and Taylor's (1996) work reports a negative association between unemployment and self-employment, hence supporting the pull effect, where the entrepreneurial effect outweighs the refugee effect. Respectively, the entrepreneurial effect is the negative link between unemployment and self-employment with a positive connection to economic growth, whereas the 'refugee' effect is the positive association between unemployment and self-employment (Thurik *et al.*, 2008). The entrepreneurial effect is higher in developed countries compared with less developed ones (Van Stel *et al.*, 2005).

Macro empirical evidence after the 2008 financial crisis reports positive correlation between self-employment and unemployment (Carmona *et al.*, 2013). This has been shown by

the increase in self-employment rates, accompanied by the decline in paid employment jobs and high unemployment rates (D'Arcy and Gardiner, 2014), whereas previously to that period no significant relationship was depicted between unemployment and self-employment (Carree *et al.*, 2002). Hence, the relationship between unemployment and self-employment is rather complex and both negative and positive at the same time, where the recession-push and the propensity-pull effects are proven to be present in the market and are rather long (Thurik, 1999, Parker, 2004; Thurik *et al.*, 2008 p:683; Dawson and Henley, 2012). Thus, there are two opposing recruitment channels into self-employment, those having the desire for personal autonomy and workers who are pushed by economic necessity (Bogenhold, 1985; Cowling and Mitchell, 1997 p: 431).

Studies on the US and Spain support the push model for self-employed (Evans and Leighton, 1989; Alba-Ramirez 1994). As for the UK, some studies favour the pull model (Blanchflower and Oswald, 1991b; Taylor, 1996; Dawson *et al.*, 2009). Others show that the self-employed chose self-employment due to lack of paid jobs, despite the low unemployment rates in the country in the UK between the years 1986 and 2000 (Smeaton, 2003).

Although the current economic conditions are significant in explaining the necessity motives behind the choice for becoming self-employed, it is still difficult to know to what extent individuals are pulled or pushed into self-employment, as the distinction becomes a bit ambiguous when motives combine and clash as 'pull' and 'push' factors at the same time. Because workers are heterogeneous and report the presence of both factors in influencing the decision to become self-employed, it makes the meaning of certain motives debatable and questionable (Brush, 1990; Dawson *et al.*, 2009; Dawson and Henley, 2012; Fairlie and Fossen, 2017). In analysing the characteristics of those who cycle in and out of self-employment, we can add to this literature on the extent to which push or pull factors dominate; particularly when we consider the extent to which behaviours are seen to change following the onset of recession

in 2008. Hence, we aim to examine the effect of these factors for our workers in the UK labour market.

2.3 The Disadvantage Theory

2.3.1 Weber, Light and Blalock Theory

Weber's (1930) disadvantaged theory and Light's (1972) cultural theory argue that individuals from ethnic minorities and immigrants to the country are more likely to start their own business because of their socio-cultural origin and features (Startiene' *et al.*, 2010 p:269). This also relates to the "middleman minority theory" by Blalock (1967), where the consensus is that certain minority groups, either from a similar religion, race or immigrant status, sojourn in certain occupations, as they are pushed out of their desirable jobs and are forced to act as buffer zones between elite groups and masses. Therefore, they prefer to enter self-employment to fill in the market gaps and to live within marginal lines (Rinder, 1958, 1959; Bonacich, 1973; Startiene' *et al.*, 2010). These groups of workers follow "the protected market theory" of Light (1972), where they allocate their work in geographical areas that are crowded with customers with similar disadvantaged characteristics, thus building geographically clustered areas and reserved economies for minority groups (Boyd, 1996b; Raijman, 2001; Andrea and Robert, 2004 p:21). Such an approach allows them to find their skills much better rewarded and in better use than if they were engaging in paid employment.

These groups of workers are reluctant to become entrepreneurs as they perceive self-employment as only a source of income rather than an opportunity (Light, 1979; Light and Rosenstein, 1995; Andrea and Robert, 2004; Startiene *et al.*, 2010). In the case of the UK, immigrants had a considerably higher percentage (3 percent) of self-employment compared to the native population in 2012 (Eurostat, 2014). Kangasniemi and Kauhanen (2013) found that they are more likely to work as self-employed or in temporary jobs due to the barriers they face in entering paid employment in the host country.

2.3.2. Roy Model

The Roy Model, by Heckman and Sedlacek (1985) examines the aspect of the disadvantage theory, pioneered by Weber (1930), by looking at certain people with unfavourable attributes, whereby individuals are more likely to enter self-employment as a response to their social exclusion in the labour market and because it would yield higher returns instead of experiencing longer spells of unemployment (Andrea and Robert, 2004). Mainly this relates to the unemployed, who are mostly viewed as incompetent and face difficulties in getting hired (Light, 1980; Evans and Leighton, 1989, Carrasco, 1999; Meager *et al.*, 2003). Similar reasoning applies to workers who are being discriminated against in the labour market, unfamiliar with the country's culture, customs and traditions, who face difficulties with their English language and are in poverty (Light, 1979; Lofstrom, 2002).

Sociologists argue that the high levels self-employment rates are explained by the presence of these minority groups known to be disadvantaged, misfit and sensitive to any changes in the labour market. This matches with the findings of Rees and Shah (1986) and Evans and Leighton (1989) that showed the self-employed to be the misfit workers for paid jobs, the low earners and the less educated ones.

2.3.3. Evidence from the Literature

At a micro level, Boyd (2000) found a positive correlation between entrepreneurship and labour market disadvantages, especially during the Great Depression. Mainly this is applied for the case of minority women who choose self-employment for survival purposes. The disadvantages may result from limited access to financial resources and constraints that bound the business set-up and increase operations in informal markets (Light and Rosenstein, 1995; Boyd, 2000; Andrea and Robert, 2004). But the presence of 'social capital' (the use of social network relations) helps overcome these financial obstacles (Aldrish, 1989). However, Fairlee and Meye (1996) argue against the success of the disadvantage theory in explaining the large

variations in self-employment, as they found that the more advantaged groups of workers from "detailed race and ethnic groups" are pulled and not pushed into self-employment (Zissimopoulos and Karoly, 2007 p:271).

The heterogeneity across countries' economic structures, regulating policies and individuals also plays an important role for both the push and pull model, the refugee and the entrepreneurial effect and the disadvantaged theory. The aim of our study is to uncover hidden dissimilarities of the UK sample workforce, to identify the motives behind why workers engage in self-employment, and the extent to which heterogeneity is present among the different subgroups of self-employed workers. Thus, adding an important dimension to these debates over whether self-employment can be thought of as a labour market state that arises from an advantage or disadvantage. As one would expect, both viewpoints have some amount of truth and are more likely representative of the heterogeneity that we observe amongst 'the self-employed'. Our distinction between sustainers and dabblers adds additional insight in this respect, as we find that the latter group have a range of characteristics that suggest they approach self-employment spells from a more advantaged labour market perspective, different from what we thought they would be. Something that has not been uncovered in existing studies.

2.4 The additive Utility Model

The dynamic Utility maximisation model of work choice between paid employment and self-employment helps us understand why workers choose to become self-employed as opposed to paid workers and when workers switch between these two employment states.

Paid employment and self-employment jobs differ in the amount and the type of work required, the number of hours and effort put in, the income or profits received, the risk involved, the working conditions and the degree of independence permitted (Levesque *et al.*, 2002; D'Arcy and Gardiner, 2014). But not only job attributes differ, workers also differ in

their own attitudes, perceptions, and motivations towards work. Thus, there are a multitude of factors which drive some individuals to be self-employed, whilst others become paid employees (Levesque *et al.*, 2002).

2.4.1 Career Maximisation Model

The career maximisation model by Douglas and Shepherd (2000) relies on the combination and comparison of both utility and disutility attributed to each type of work (paid employment in comparison to self-employment), where the state with the highest utility is chosen (like the assumption of Evans and Leighton (1989)).

Similar reasoning is followed when studies include the unemployment option in the utility maximisation model (Lofstrom, 2002; Georgellis and Wall, 2005). The model expects workers to be rational in the job making decision. They choose self-employment over paid employment and unemployment, if the overall expected utility and the expected derived benefits from self-employment are higher than both paid employment and unemployment (Evans and Leighton, 1989; Lofstrom, 2002; Georgellis and Wall, 2005; Dawson *et al.*, 2009), because workers face different alternatives with different payoffs and the propensity to exploit an opportunity differ on an individual level.

Other additional means that influence the work choice are the cost for obtaining resources, capital availability and stronger social ties (Evans and Leighton, 1989; Block and Wagner, 2010). Another determinant is how useful and transferable the information gained from previous employment activity is (Cooper *et al.*, 1989). Shane (2003) proposes other mechanisms that can explain the differences between discovering and exploiting opportunities like life experience (Romanelli and Schoonhover, 2001), social network (Ozgen and Baron, 2007), search processes (Hills and Shrader, 1988), absorptive capacity (Cohen and Levinthal, 1990) and intelligence and cognitive abilities (Sarasvathy *et al.*, 1998), (Block and Wagner, 2010, p:158).

2.4.2 Expected Net Present Value

The literature also emphasises on the payoff returns (income and profits) from work (Baumol, 1990). Campbell (1992) evaluated these payoffs using the Expected Net Present Value method (ENPV), where workers are motivated to enter self-employment if the ENPV of profits (the sum of all monetary costs and benefits) derived from self-employment is positive. Eisenhauer (1995) built a similar economic model based on the expected utility derived from income and included the working conditions between paid employment and self-employment. Douglas and Shepherd (2000) presented the utility maximisation model of career choice as a combination of all income, risks, work efforts and independence, where individuals' choices for work (to enter self-employment or paid employment) correspond to the greatest utility derived from the combination of the best employment option (Douglas and Shepherd, 2002; Levesque *et al.*, 2002). Here, workers gain utility when income is received and disutility from working and exerting efforts in the job. Furthermore, workers have different degrees of aversion that influence the job making decision, with the higher degree of aversion, the higher is the disutility found from working (Alchian and Demstez, 1972; MacDonald, 1984; Furnham and Koritsas, 1990; Douglas and Shepherd, 2000, Levesque *et al.*, 2002).

2.4.2.1 Financial Benefits

The financial motives are the pecuniary rewards to self-employment, where they are mostly identified as pull factors and indicate opportunity rather than necessity (Carter, 2011). They are found to be significant for entrepreneurial activities, but less important for women than men (Douglas and Shepherd, 2002; Georgellis and Wall, 2005; Taylor and Newcomer, 2005 and Cassar, 2007). Consequently, individuals might be motivated or attracted to self-employment if the expected earnings are higher than the perceived earnings from wage employment (Le, 1999; Drinkwater, 2000; Parker, 2004; Dawson *et al.*, 2009). Therefore, we

consider the financial gains to be positively associated with the transition into self-employment (Georgellis *et al.*, 2005).

2.4.2.2 Non-Financial Benefits

Also the non-pecuniary benefits play an attractiveness role into self-employment, as they provide the advantage of personal autonomy, need for self-expression and status, self-realisation, job satisfaction, independence, flexibility of working hours, innovation, better use of own skills and abilities, and greater control over life decision making (Gatewood *et al.*, 1995; Dennis, 1996; Blanchflower and Oswald, 1998; Feldman and Bolino, 2000; Carter *et al.*, 2003; Frey and Benz, 2004; Hughes, 2006; Cassar, 2007, Dawson *et al.*, 2009). But it is also worth noting that the self-employed also face challenges and disadvantages, as their income is unpredictable, and they lack the rights and protection of wage earners (statutory sick pay, maternity pay, training support, employer pension etc.). Hence, it is important to weigh up both advantages and disadvantages before taking any career option (D'Arcy and Gardiner, 2014).

2.4.2.3 Risk

Both employment options also vary in the level of risks, where paid employment is less risky, because employees receive a fixed monthly salary and are only uncertain regarding the amount of commissions and bonuses they get, whereas the self-employed are unsure of their potential profits. Hence, business owners may exert lots of effort without receiving any remuneration or returns to their work. The level of risk represents a level of disutility to workers for career decision making (Knight, 1921; Duchesneau and Gartner, 1990; Douglas and Shepherd, 2000, Levesque *et al.*, 2002). Also, the level of independence in work, and the preference for decision making and autonomy exert both utility and disutility levels for individuals, as well as the different working conditions available for each type of jobs, all depending on people's perceptions and attitudes towards work, where some workers may prefer to be directed, whilst others are confident with the responsibility that comes with independence (Douglas and

Shepherd, 2002; Levesque *et al.*, 2002).

Accordingly, high independence level constitutes high utility measure for the self-employed and disutility level for regular employees, and the flexibility in working hours in self-employment is more likely to present high utility level (Bird, 1989; Katz, 1994). Hence, workers choose the career path that mostly maximises their expected utility (Douglas and Shepherd, 2000; Levesque *et al.*, 2002). The utility here represents the positive attitudes and the pecuniary/non-pecuniary benefits gained from activity, whereas disutility is the product of negative attitudes, the opportunity cost, and the disadvantages devoted to the chosen career option (Levesque *et al.*, 2002).

Empirically, Goetz and Rupasingha (2009), in their study between the years 1990 and 2000, found that the self-employed responded rationally to any economic change. It is possible for workers to engage in both activities at once, where they can choose the level of risk they perceive as acceptable from self-employment and still receive a fixed monthly pay from paid employment at the same time (Jovanic, 1982; Bruce, 1999).

In our study, we expect that workers are rational when choosing between paid employment and self-employment and weigh up both benefits and costs (both pecuniary and non-pecuniary) between these two labour market states to choose the more prevailing option to engage in. Our distinction between sustainers and dabblers adds additional insight in this perspective. This is particularly important to our group of self-employed dabblers, with their agile of way of working between self-employment and paid employment, at different times in our study. Our results show that this group of workers are making the best out of self-employment and paid employment jobs as they arise, through appropriate times and conditions. Thus, we provide key insights on a group that was not identified to date and we clarify the status behind their way of work.

2.5 Human Capital Model

The human capital concept is based on three main components. It consists of a person's ability whether innate, from birth or acquired over time, the qualifications and knowledge gained from formal education and the skills and experience of on-the-job training (Blundell *et al.*,1999). Education plays a crucial role in the job market, as highly educated workers earn more than the less educated ones (Appleton *et al.*, 1999). The Human Capital theory (Mincer, 1958, 1974; Schultz, 1961; Becker, 1964, 1975) suggests that formal schooling and work experience play a critical role in the job market, where individuals invest in means of education and training programs to have better job opportunities and higher earnings, through increasing their productivity levels.

Education can be regarded like any other business investment; instead of physical capital, individuals invest in their own human capital (Schultz, 1961; Johnes and Johnes, 2004). But there are current costs and future rewards to be expected. People invest in education and training programs to increase their productivity and to yield higher future earnings and more employment opportunities (Schultz, 1961; Becker, 1964; Mincer, 1974). Workers mainly choose a given level of education '*s*' as a mean to maximise their expected present value of future income, when work starts at date '*s+1*', up to the retirement date at '*T*', where the net cost of education is 'c_s'. They only invest in education if their discounted marginal returns for investing is positive, and when the costs of investment 'c_s' do not exceed the returns '*r*'. The optimum level of schooling '*s*' is when the present value of 's^{th}' years of schooling is equal to the cost of these years is 'c_s', when the rates of returns to human capital investment are greater than the market rates of interest (Blundell *et al.*,1999).

Hence, there is a trade-off between lower pay today, attributed to continuing in education, and higher earnings tomorrow, as returns to this investment. This trade off, along with financial and institutional constraints "limit the access to education and determine the

distribution of educational attainment within a population" (Borjas, 2013 p:235), whereby individuals only perceive the monetary benefits derived from education and do not consider other unquantifiable benefits, known as externally positive spill-overs (Blundell *et al.*,1999). There is evidence that human capital increases productivity (Psacharopoulos, 1985; Lorenz and Wagner, 1990; Card and Krueger, 1992; Ashenfelter and Krueger, 1994; Psacharopoulos and Patrinos, 2004), but it is hard to find methods to estimate the impact of education on economic growth (Sianesi and Reenen, 2000).

2.6 Labour Market Segmentation Hypothesis

The Labour market segmentation hypothesis implies that the human capital model does not apply to all parts of the labour force, because markets are not all competitive and lack sufficient job opportunities (Veitch, 2007). The presence of imperfect competition or barriers to entry in different work, does not necessary imply that wage differentials between high and low skilled workers are only attributed to productivity differences (Blundell *et al.*,1999). This view gives rise to the informal sector and contradicts the human capital theory, by claiming no relationship between earnings and education (Mazumdar, 1983). Hence, evidence from the literature review suggests that the returns to education is not valued equally for wage earners and self-employed, where it is less clear for this latter group (Williams, 2002). The theory of compensating differentials states that wages will differ between workers because jobs are different, and workers are distinct in their own skills, abilities and human capital (Borjas, 2013).

2.7 Signalling and Screening Hypothesis

An alternative theory is the screening or signalling theory (Spence, 1973; Arrow, 1973 and Stiglitz, 1975). The theory claims that rather than having a causal impact on productivity, education plays the role of separating the less able from the more able and serves as a screening device that signals workers' productivity and helps employers identify suitable employees for specific jobs in a world of asymmetric information (Fossen and Buttner, 2013). Therefore,

higher education is associated with higher job opportunities along with higher earnings levels, because of signalling productivity and not raising it, the reason being that productivity differences between workers exist from birth and are not relevant with the level of schooling workers receive (Borjas, 2013).

Evidence from Portugal and Spain by Garcıa-Mainar *et al* (2005) suggests that the signalling hypothesis plays a crucial role in determining an individual's income, especially for the highly educated, although Brown and Session (2004) found weak evidence in the support of signalling and screening hypothesis.

The signalling role is less evident for the case of self-employed because no employer exists, where studies suggest that the returns to education are not rewarded in self-employment, showing no relationship between earnings and education for this sector (House *et al.*, 1993; Taylor, 1996). But exceptions do exist for certain types of self-employed, where greater education would signal higher productivity and better quality of service for customers, thus implying similar predictions to the Screening hypothesis (Williams, 2002; Inmaculada, 2009). Therefore, studies (e.g. Williams, 2002; Parker and Van Praag, 2006; Inmaculada, 2009) reveal doubts on using self-employment as a control variable to test the validity of the Screening theory.

2.8 Personal Control Theory

On another note, Douhan and Van Praag (2009) developed the Personal Control theory to explain why entrepreneurs should enjoy higher returns to their human capital than employees. The theory claims that entrepreneurs should have better control over their employment and use of own human capital, because they do not face organisational constraints like paid workers (Douhan and Van Praag, 2009; Van Praag *et al.*, 2013). But the theory is more relevant to opportunity than necessity entrepreneurs, as this latter group has less control over own human

capital because they are pushed into self-employment due to lack of alternative work and to escape unemployment (Ben and Frey, 2008; Fossen and Buttner, 2013).

2.9 Returns to Human Capital

2.9.1 Returns to Formal Education.

The theoretical literature along with the empirical literature suggests that there is a positive impact of education on individual earnings and on economic growth. Earlier studies ignored the problems that arise from ability and measurement error bias, and the direct and indirect cost by using gross rather than net returns. However, recent studies have attempted to control for these problems and found a positive impact on the net rate of returns to education on individual earnings. Evidence from the UK, as with similar developed economies, suggests that the average estimate on the gross rate of return for an additional year of education ranges between 5 to 10 percent (Blundell *et al.*,1999).

For this reason, in the UK the government publicly subsidises schools and prioritises accredited adult learning (Department for Education, 2016). The education system in the UK is divided into four stages; primary, secondary, further and higher education. The government determines the compulsory school leaving age for the young. Compulsory schooling starts at the age of 5 and lasts till the age of 16. There "has been an increase in the minimum age which all young groups are required to continue education or training towards the end of their academic year by which they turn 17 and until their 18th birthday in 2015" (Department for Education, 2013; gov.uk, 2015).

Most of the academic qualifications in the United Kingdom are obtained through educational systems, where at the end of the compulsory schooling age students take their first examination, known as the General Certificate of Secondary Education (Blanden *et al.*, 2012). The introduction of the GCSE examination in 1986 aimed to create a single examination system for the whole of the UK. In 1982, vocational education was also introduced in schools, known

as the Technical Vocational Education Initiative. The aim behind this scheme was to provide a link between school and work and bring together the human capital gained from academic and vocational qualifications with work experience for young workers to help standardise the qualifications needed for business. In 1995, the Modern Apprenticeship (MA) schemes were introduced to complement the Youth Training programs for 16 and 17-year-old pupils.

The UK government places a great emphasis on policies that promote "an explicit target for a certain level of attainment of qualifications to be achieved by a certain population level" (Blanden *et al.*, 2012 p:502), as the main concern is to tackle the deficiencies in education, to deal with the high levels of youth unemployment in the country and the lack of skills in many young workers. Thus, a person's qualification refers to the accumulation of human capital, the knowledge and skills acquired throughout his/her lifetime to yield back economic returns. Also, for a society, having a highly-skilled labour force achieves competitiveness and enables the transition into a knowledge based economy.

Individuals who complete schooling and with formal qualifications have larger significant returns than those having completed the same schooling level but without any formal qualifications. Individuals who have five or more O-levels receive on average returns of 21 percent more compared to those not having any qualification and for women it is 26 percent. The GCSE qualifications would normally be completed at the age of 16 before leaving school, and the A-level qualifications are completed at the age of 18 for those who continue their schooling and are the entry qualifications for higher education. Those who complete A-level school qualifications compared with those with GCSEs earn 11 percent more for women and 13 percent for men. Also, the average annual return to education for first degree in comparison to those having A-levels is in the range of 10 to 13 percent for women and 5 to 8 percent for men, in terms of hourly rate and assuming 3 years for degree completion (Arulampalam, Booth and Elias, 1997; Blundell *et al.*, 1997; Dearden, 1999). The difference

in the A-levels is lower for women than for men in the UK, when both have the same educational background. But these studies (e.g. Blundell *et al.* (1997); Dearden (1999)) used data from the 1970s and 1980s and are more likely to have overestimated the returns to education, oppositely to other studies from the US (e.g. Butcher and Case (1994)) where women yield higher returns to human capital, but the difference in returns between gender has narrowed over time. Along with the gender gap in the returns to education, there is also a difference in educational achievements, where women tend to outperform men (Andrew *et al.*, 2001).

Angrist and Krueger (1991) looked at the effect of compulsory school attendance on educational attainment and earnings and found that students who are forced to attend school for a longer period earn higher wages because of their extra schooling. But for both men and women, there are decreasing returns to successive investment in human capital with decline in the rates with the levels of schooling (Vaillancourt, 1993). Similarly, this is the case in the UK where the returns for A-levels are lower than the returns for O-levels for both male and female workers (Blundell *et al.*, 1997; Dearden, 1999). Harmon and Walker, (1995) and Hartog and Oosterbeek (2007) reported 15 percent returns to human capital, but Card (1999) argued that these high estimates are probably since individuals are heterogeneous and that the returns vary from one person to another. This is the case in Harmon and Walker's (1995) study, where they were only concerned with certain sub-groups within the UK that were forced to stay in schools after changes to the compulsory school leaving age in the UK. This has resulted much higher returns for this specific sub-group than the average returns to education for the whole UK population.

Dearden (1998) found that, on average, the annual rate of returns to an extra year of education were 5.5 percent for men and 9.3 percent for women. But these figures ignore part-time education and apprenticeship and are only averages for the population, which may vary

depending on the type of qualifications obtained. The returns also differ by fields of study, where men undertaking biology and chemistry have lower returns than women studying education, economics and accounting (Blundell *et al.*, 1997). Lillard and Tan (1992) found that individuals who work in industries that undergo rapid technological progress experience higher returns to education, because better educated workers can adapt faster and respond better to technological changes and yield higher productivity in high-tech firms. Thus, the returns to education for individuals evolve over time due to changes in the supply and demand of workers' qualification levels (Moghadam, 1990; Schmitt, 1993). Also, the levels of education vary among countries' development, where primary and secondary schooling are mostly important for developing countries an d tertiary education is crucial for the growth of OECD countries (Sianesi and Reenen, 2000).

Lately, there has been a substantial increase for individuals obtaining a degree in Britain, from 13 percent in 1980, 33 percent in 2000, to 67 percent in 2014 (Walker and Zhu, 2003; O'Prey, 2015). The perception is that education affects a person's productivity and higher education qualifications improve students' employment prospects and boost lifetime earnings. But over the past decade, the UK higher education sector has changed in size and shape, with the ongoing reduction in public funding, the economic downturn and the introduction of the new undergraduate scheme (O'Prey, 2015). This resulted an increase in English university tuition fees in line with inflation (2.8 percent) in the economy, from zero in 1997 to £1,000 in 1998, £3,000 in 2006 and to £9,000 in 2012 (OECD, 2015; Bolton, 2018 p:13). Hence, as the economy changes universities, this will play a central role in affecting and developing the UK workforce. This raises concerns about the increasing level of student debt in the UK, making England the highest in university tuition fees in the industrialised world, followed by the US and Japan. However, the levels of university applicants in the UK do not seem to be affected by the higher fees, as the levels have not changed over the past years. This

is due to government support of the new higher education funding regime and the creation of the National Scholarship Program (NSP) that replaces the minimum statutory bursary and provides financial support to disadvantaged students (Chowdry, Dearden and Lioyd, 2012).

This rapid and massive expansion in education over time has increased the interest of researchers in the returns to education, making the relationship between education and earnings one of the most commonly studied topics in the economic literature. Hence, the rate of returns to schooling plays a very important role for policy decisions on any subsidising policy for education that can improve the economic well-being of the low income and disadvantaged workers (Borjas, 2013). Our study contributes to new microeconometric evidence on the returns to education for our division of workers, where we compute the earnings returns to years of education for a group of self-employed [*dabblers*] that has not been identified to date, and we show how education is valued differently between the self-employed and paid workers. Along with this, we study the effect of educational theories (the human capital model, the screening hypothesis and personal control theory) on our group of workers and provide new comparable evidence with the established literature.

2.9.2 Returns to work training and experience.

Training is also valued similarly as education because it increases earnings by affecting individuals' utilities. It is an important component of the human capital stock, making up at least half of workers' human capital (Borjas, 2013). Training is different from formal and post school qualifications, because it is based on courses that help develop skills to use on the job (Green, 1993). Training can be classified into specific and general. Specific training only enhances workers' productivity in a specific firm and is lost once workers decide to leave the job. General training is generally associated with formal education, it enhances workers' productivity equally in all firms and is not lost when leaving the job market (Borjas, 2013). Firms are reluctant to pay for this kind of training due to the problem of poaching once trained

employees decide to leave for other firms when offered higher pay. For that reason, most workers bear the costs by accepting lower earnings during training periods to be compensated with future higher pay (Borjas, 2013).

Since 1980, there has been an active involvement of the UK government in funding such training programs, especially for the youth, because of the realisation that vocational training is human capital investment in those who decide to quit school at an early age and serve as an alternative to unemployment (Dolton, Makepeace and Treble, 1994). The private returns from employer-provided and vocational training on individuals' real earnings are found to be significant and comparably higher by 5 percent to those who do not undertake it, and closer from 5 to 10 percent for middle or higher vocational qualifications (Blumdell, Dearden and Meghir, 1996). Booth (1991) found that the returns to training are larger for working women than men but vary depending on the different sources and types of training courses, whereas employer-provided training courses are higher than off-job training, followed by training from businesses, vocational schools and lastly from regular schools (Lillard and Tan, 1992; Tan *et al.*, 1992; Blundell, Dearden and Meghir, 1996).

But the evidence from the UK suggests that the impact of training schemes on pay is negative. This was shown when evaluating the impact of the Youth Training Scheme (YTS) between the early 1980s and the mid 1990s on post-training earnings in Andrews, Bradley and Upward's (1999) work. It may be that potential employers see that workers who undertake youth training program have lower skills and abilities (Dolton, Makepeace and Treble, 1994). However, Dolton, Makepeace and Gannon (2001), in their other study found no effect of government supported training programmes on pay.

Additionally, studies have found that skills acquired from job training depreciate over time, and there are declining returns for vocational training, where it needs to be renewed from time to time to retain its benefits (Lillard and Tan, 1992; Mincer, 1994; Blundell, Dearden and

Meghir, 1996; Arulampalam, Booth and Elias, 1997). This is especially the case for industries characterised by high rates of technological changes, where the transferability of training diminishes faster (Blundell, Dearden and Meghir, 1996 (case for the UK), Lillard and Tan, 1992 (case for the US)). Still, training has its benefits where it influences occupational status, increases likelihood to get promoted, where workers who undergo such programs are less likely to quit or become unemployed (Lillard and Tan, 1992; Booth and Satchell, 1994; Blundell, Dearden and Meghir 1996 (case for men); Dearden *et al.*, 1997, Dearden, Ferri and Meghir, 1998; Heckman, 1998). On another note, Blundell, Dearden and Meghir (1996) found that workers with low or no intermediate-level of formal education and with low social economic status have the highest returns to training, but, their participation in these programs are very low. Therefore, the results from such training do not inform us on the effectiveness of these programs.

The limitations of the training programs that they do not include the division of costs between employers and employees, and the returns to employers are quite different from the returns to employees and are harder to measure. These are highly-aggregated descriptions that miss out on capturing the determinants and the effects of different forms of training (Blundell, Dearden and Meghir, 1996). Another problem with this approach is that it does not consider nor control for individual characteristics, like motivation, that has a great influence on getting a better job and wage (Ziderman, 1975). For that reason, we restrain from looking at the effect of training programs on the earnings returns for our workers, and only rely on computing and identifying the returns for formal education and vocational education for the two subgroups of self-employed and paid employees.

2.9.3 Returns to the three components

The three components that make up the human capital complement each other, where the accumulated stock of human capital gives more incentive to invest more in human capital

formation and growth. Education and training may provide positive spillover to the economy by educating people and providing a more skilled labour force that helps increase firms' productivity and the productivity of the less educated/skilled cohort (Redding, 1996; Gemmell, 1997). But one should account for the dynamic forms of selection and endogeneity, where results can change dramatically if these issues are not considered.

There is good evidence of a positive relationship between education and training on the accumulation of human capital (Benhabib and Spiegel, 1994; Gemmell, 1996), and a complementary relationship between the different types of human capital investments, where early achievements determine future educational attainments, which allows workers to undergo training programs (Blundell *et al.*, 1999). It is evident that human capital is an important factor for individuals, firms and for the national economic growth, where it has positive economic returns for individuals (Sianesi and Reenen, 2000).

Studies on wage earnings attempt to differentiate between the general and the specific human capital, whereby the general human capital, like educational levels, are regarded as a predictor for starting wage for workers, and more specific human capital, like tenure, acts as an indication of wage rise over time (Kriechel and Pfann, 2005). But there are two types of returns that need to be considered; the private rate of returns and the social rate of returns. The private rate of returns are the costs and benefits encountered when choosing to proceed in education and explains individuals' behaviour in choosing specific levels and types of education to undertake (Psacharopoulos and Patrinos, 2004). The social rate of returns are the returns that the government receive after funding for education. They comprise the returns to employment, the wages accompanied with higher tax income, the social inclusion and cohesion, the crime reduction and the health improvement of people in society (Mingat and Tan, 1996). Hence the social rate of returns are the returns on educational investments that accrue to society in terms of social benefits. This rate helps policy makers in choosing suitable

educational policies to implement in the market (Psacharopoulos and Patrinos, 2004).

The returns may vary depending on the level and type of qualification and source of training workers get. But the positive spillovers are the main reason behind public support for education. They are known by the non-pecuniary benefits associated with the human capital accumulation (Heckman, 1999). These benefits are not measured in terms of wages, but in terms of quality-adjusted life, where the evidence shows that more educated individuals enjoy better life conditions in terms of health and happiness, compared to less educated ones (Oswald, 1997). Summers (1992) and Van Lith (1998) also linked the indirect benefits of education and training on society to higher fertility, improvements in sanitation and more lives saved, better social unity, less crime and improved social responsibility. Still, difficulties lie in calculating and identifying the size of the true social return of education and training, therefore in this thesis we only consider and compute the private rate of returns to human capital for our workers.

2.9.4 Measurement Problems.

Problems arise from measuring the true causal impact of education and training on individuals' earnings due to unobserved ability bias and measurement errors (Blundell *et al.*, 1999). Measurement errors occurs when reporting the data and leads to downward biased estimates. The unobserved ability bias is caused by the possible association of a worker's inherent ability with his/her level of schooling, where the possible increase in correlation between ability and schooling can cause an increase in the returns to schooling but without having a corresponding increase on the true impact of schooling on wages (Blackburn and Neumark, 1993 p:522). Hence, this does not help identify the true causal impact of higher education and training on earnings, since a person's own capacity and ability may well affect his/her own decision to proceed to further education and/or to undergo training. This is when education becomes costlier for the less abled than for the more abled (Jones and Johnes, 2004). Thus, the ability

bias estimates would be too large. These unobserved individual characteristics such as ability, motivation and schooling quality are difficult to measure and cause the endogeneity problem of education. Moreover, there are problems with the self-selection bias, where workers self-select themselves into jobs for which they are best suited. By that, the choice of work, either for the self-employed or paid workers is no longer random and can produce biased estimates (Ashenfelter, Harmon and Oosterbeeek, 1999; Card, 1999; Harmon, Oosterbeek and Walker, 2003; Shane, 2006; Dickson and Harmon, 2011; Henderson, Polacheck and Wang, 2011). Failure to control for these unobserved differences between individuals may cause severe bias estimates. Also, there are methodological problems when measuring the human capital and computing the earnings returns at a macro level, because of the systematic difference across developing and developed countries. However, more consistent results are found with the micro-economic evidence (Sianesi and Reenen, 2000).

Instrumental variable technique is employed to correct the biases that arise when using the Ordinary Least Squares method, caused by the simultaneity between schooling and earnings. This method estimates the average treatment effect among those who alter their treatment status because they react to the instrument (Heckman, 1997). A valid instrument helps determine whether an individual is treated or not but does not help determine other factors that affect the outcome of interest. Still, it can overcome the estimation bias that arises from the Ordinary Least Square model (Orepoulos, 2006 p:152). Harmon and Walker (1995) used the minimum schooling leaving age law in the UK as instrument, and their findings showed that there is large negative bias in the least-square estimates of schooling-earning relationship. This provides evidence of the downward bias OLS estimators for the returns to schooling. Similar findings were also shown in Angrist and Krueger's (1991) work. But their technique was criticised by many, especially Card (1999), who claimed that the negative bias is due to the difference in the discounted rates for educational investment. This is because the use of

instrumental variable estimates is on the effect of treatment groups, whose choices are affected by the instrument in question. Card (2001) and Lang (1993) found that the IV estimates often exceeds the OLS estimates by 20 percent and even more. They suggest that the higher IV results could occur because they measure the average effect among a small and peculiar group, whereas the OLS estimates measure the average effect of the whole population; however, they are affected by the omitted variable and measurement error biases. Hence, the results need to be interpreted carefully because the estimates found are imprecise, and the empirical strategy used is not randomised. This concludes that no individual study can give precise estimates on the magnitude of ability bias of OLS estimates to the returns to education (Card, 2001).

In our study, we address these problems in the computation of earnings returns to education and we explore new approaches to deal with the endogeneity problem of education and self-selection into self-employment and paid employment. We believe that having a group of workers who dabble in and out of self-employment and paid employment is somehow selective in both states. Thus, capturing their returns and comparing with our group of sustainers and paid workers allows us to add significantly to understanding this area and to strengthen our contribution on the earnings returns to education in self-employment.

2.10 Self-Employment

Most earlier research focused on examining the various constructs of entrepreneurship without paying much attention to self-employment (e.g. Marshall (1930), Cantillon (1931), Schumpeter (1934), Knight (1971), Kirzner (1973)). During the 1970-1980s the concept of self-employment began to attract researchers, due to the increase in the number of solo start-up businesses in the labour market (Stripeikis, 2008; Startienė *et al.*, 2010). The changes in the supply of workers, especially the increased number of women, youth and elderly people in the labour market, the presence of discrimination between ethnic minority groups and immigrants,

all played a crucial role in the dispersion between different skills into self-employment and positively impacted its growth (Startienė and Remeikiene, 2008, 2009).

2.10.1 Self-employment Definitions

Self-employment is "the oldest way by which individuals offer and sell their labour in the market" (Parker, 2004 p:1). It is a complex type of labour market status, which contains a wide range of activities (Dawson *et al.*, 2009), a phenomenon by which people prefer to engage in and is considered as an alternative to paid employment (Rees and Shah, 1986; Evans and Leighton, 1989; Blanchflower and Oswald, 1990, 1998; Blundell *et al.*, 1995; Taylor, 1996; Carrasco, 1999). But self-employment has "no single legal definition" (D'Arcy and Gardiner, 2014 p:8). This lack of description is causing an issue, where there is currently no clear understanding of the employment status within self-employment, because the self-employed engage in wide range of different sectors and activities (Deane, 2016).

The most common description of the self-employed is based on the traditional employment classification used by the International Labour Organisation (ILO) and the Organisation for Economic Cooperation and Development (OECD). The self-employed are defined as business owners responsible for companies' assets, for taking decisions that influence the business, and relying on future profits as the only source of income from goods produced and services provided to the market (Pedersini and Coletto, 2009; Startienė *et al.*, 2010 p:264). Workers are self-employed if they work on average for at least twenty-five hours in their own businesses on a weekly basis (Ahn, 2010; Lofstrom and Bates, 2009). They might legally register their activities, to be known as incorporated self-employed, or not and be classified as unincorporated self-employed (Evans and Leighton, 1989; Evans and Jovanovic, 1989; Schuetze, 2000; Lunn and Steen, 2000; Startienė *et al.*, 2010). Still, mis-specifications

arise when persons identify themselves as self-employed while in fact they are owners or only partners and do not practice the work (D'Arcy and Gardiner, 2014).

2.10.2 Evidence and Link to economic growth

When asked, 46 percent of the UK population would like to enter self-employment, but few would do so (Burke et al., 2000, 2002; Blanchflower et al., 2001; Constant and Zimmerman, 2004; Gallup Organisation, 2010). Self-employment is closely associated with 'entrepreneurship' and is one of the ways in which individuals supply the skills of entrepreneurship in the economy (Urwin and Buscha, 2012). It promotes economic growth by including a wide range of activities, creating new job opportunities, providing new services to the market, endorsing social welfare, and reducing poverty levels in the country (Binks and Vale, 1990; Parker and Johnson, 1996; Ashcroft and Love, 1996; Blanchflower, 2000; Fritsch and Mueller, 2004; Thurik et al., 2008; Fritsch, 2008; Henderson and Weiler, 2010; Dejardin and Fritsch, 2011, Goetz et al., 2012; Urwin and Buscha, 2012).

It is "increasingly recognised as the broad-based driver of economic growth and societal well-being" (Kelley *et al.*, 2013 p:2), and it is well thought of as a mean to escape unemployment by serving as an alternative to paid jobs (Bryson and White, 1996; Carrasco, 1999, Dawson *et al.*, 2009; Dawson and Henley, 2012). It operates as a positive contribution to the labour market, a route into employment, because it widens the choice for new potential entrants. Plus, it facilitates the labour market entry for the unemployed, the misfits and the discriminated workers, who experience difficulties in finding paid job opportunities (Carrasco, 1999, Taylor, 2004; Meager, 2007; Urwin, 2011; Urwin and Buscha, 2012). It is considered as way for self-fulfilment that offers flexibility for workers. Where, the self-employed can choose

what to do, when and where to work. It allows creativity, personal autonomy, control over own decisions and balance between work and life (D'Arcy and Gardiner, 2014).

Empirically, no positive association was found between self-employment and GDP growth in Blanchflower's (2000) work, as the self-employed who were previously unemployed tend to have lower levels of human capital, less wealth and not much entrepreneurial talent that would help them withstand in the business (Johansson, 2000; Hurst and Lusardi, 2004; Thurik *et al.*, 2008). This stress the importance of the presence of legal institutions to help support the self-employed (Acs *et al.*, 2014). Baumol (1990, 1993) asserts the presence of inter-relationships between institutions and entrepreneurship, where countries with strong institutions have more productive entrepreneurs and a greater impact on growth, whereas weak supporting institutions would only create destructive entrepreneurs (Murphy *et al.*, 1993; Acemoglu *et al.*, 2005; Baumol and Storm, 2007; Parker, 2009; Acs *et al.*, 2014).

In addition, the self-employed do not always possess the basic employment rights or privileges of paid employees (Hatfield, 2015; Deane, 2016). Some workers enter for pull reasons and positive motivation and are triggered voluntarily into self-employment by perceiving it as an opportunity to develop their own skills and make better financial profits (Benz and Frey, 2004; Taylor, 2004; Benz, 2005; Dawson and Henley, 2012). Others are forced by push factors and negative conditions to enter self-employment due to lack of regular paid job vacancies, discrimination, redundancy and the worsening of economic conditions (Brush, 1990; Clark and Drinkwater, 2000; Dawson and Henley, 2012; Barnes, 2013).

Thus, many debates reflect a wider question of whether the self-employed are "pushed" or "pulled" into self-employment. The growth in self-employment during the current economic downturn has added further fuel to these debates, with many suggesting a 'push' into self-employment and questioning whether self-employment is an easily accessible route into the labour market or an insecure dead end. In contrast, the link that many make between self-

employment, small businesses and entrepreneurship see this form of working as a fundamental driver for long-term growth and emphasise on the 'pull' motives of being one's own boss. Our study aims to clarify these thoughts; the extent to which our two subgroups of self-employed are pushed or pulled into self-employment and the impact of the crisis on transition behaviours in self-employment to help explain the overall changes that occurred in self-employment over recent years and the changes that occurred in the work's nature, especially with regards to this dabbling form of work.

2.11 Self-employment Divisions

2.11.1 Self-Employed and Entrepreneurs

An extensive amount of research looked at the self-employed as entrepreneurs, treated both types of workers as one, and both terminologies were used as synonyms (e.g. Blanchflower and Meyer, 1994; Wagner and Sternberg, 2004; Tubergen, 2005; Mueller, 2006; Wagner, 2006; Freytag and Thurik, 2007; Henley, 2007; Tervo, 2008; Akyol and Athreya, 2009; Block and Sandner, 2009; Lofstrom and Bates, 2009). On the other hand, another group of scholars examined the distinction between the self-employed and entrepreneurs and questioned to what extent self-employment might reflect the true level of entrepreneurship (e.g. Blanchflower and Oswald, 1998; Levesque *et al.*, 2002; Blanchflower, 2000, 2004; Stel *et al.*, 2005; Krasniqi, 2009; Dawson *et al.*, 2009). Self-employment is still perceived as an important proxy for entrepreneurship despite the drawback in combining all heterogeneous activities into a sole measure (Evans and Leighton, 1989; Storey, 1991; Gemmell, 1998; Blanchflower, 2000; Wenneker *et al.*, 2002; Beugelsdijk and Noorderhaven, 2005; Van Stel, 2005; Henley, 2007; Greenberg, 2007; Nystrom, 2008; Thurik *et al.*, 2008; Caliendo *et al.*, 2009). Still, it is thought of as a less desirable state than entrepreneurship.

Workers unwillingly choose to enter self-employment, because of the deteriorating economic conditions and the lack of paid jobs. Others engage in it for the flexibility of the

working hours and find it as a better alternative to unemployment (Dawson *et al.*, 2009; Dawson and Henley, 2012). Findings have proven the significance of these factors for women who become self-employed (Taylor and Newcomer, 2005). As for entrepreneurs, they represent the stock of highly talented workers (Blanchflower *et al.*, 2001); where they discover hidden profits in the market, provide new services and ideas and enhance growth in an economy, hereafter studies show that men are more likely to engage than women (Kirzner, 1973; Yu, 1998; Parker, 2004).

The self-employed are considered the simplest type of entrepreneur because they do not often require a significant amount of management skills, understanding of business processes and legal set-ups, along with sufficient funds for financial investments (Blanchflower, 2000; Spence and Gomez, 2004). The main difference to take into consideration is that entrepreneurs innovate and bear income risk, though the self-employed suffer only from income risk (Fossen and Buttner, 2013). The latter is one aspect of entrepreneurship but may not capture the whole level of innovation and size of enterprise (Glaeser *et al.*, 2010). Thus, entrepreneurship is crucial for economic growth and is universally good, but the nature from where it evolves is still unpredictable (Urwin, 2011 p:12).

Entrepreneurship activities are well supported by the UK government, because they are considered universally good and produce desirable outcomes for an economy. Nonetheless, self-employment activities do not seem to take such a great focus by policy makers, because workers' intentions towards choosing this employment path are unclear and indecisive (Urwin, 2011). Thus, one of the top nine Structural Reforms for the department of Business, Innovation and Skills' business plan (BIS) for 2011 and 2015 was to promote a decade of entrepreneurs by boosting enterprise without claiming any reference to self-employed workers (Urwin, 2011 p:39).

There is certainly no lack of research on self-employment and entrepreneurship, but the problem persists in defining and establishing boundaries between these two definitions (Bruyat and Julien, 2001 p:166; Parker, 2004 p:3). In our study, we distinguish between entrepreneurs and self-employed and do not use these terminologies interchangeably, where we argue that the entrepreneurial effect is more evident for self-employed workers with higher levels of qualifications and in higher industry skill levels.

2.11.2. Necessity/Push and Opportunity/Pull Entrepreneurs.

The Global Entrepreneurship Monitor (2001) program distinguishes between two types of entrepreneurs 'necessity' entrepreneurs and 'opportunity' entrepreneurs (Reynold *et al.*, 2002; Sternberg *et al.*, 2006; Block and Wagner, 2007, 2010; Block and Sandner, 2009; Singer *et al.*, 2015). Necessity entrepreneurs are pushed to become entrepreneurs by need, due to lack of alternative employment options, threat of unemployment, and because of family and personal reasons (Amit and Muller, 1995; Granger *et al.*, 1995; Reynolds *et al.*, 2002; Hughes, 2003; Block and Wagner, 2006; Bergmann and Sternberg, 2007; Kautonen *et al.*, 2011; Berner *et al.*, 2012; Fossen and Buttner, 2013; Block *et al.*, 2014). They are also referred to as 'pushed' entrepreneurs, and are classified as 'refugee entrepreneurs', 'reluctant entrepreneurs' and 'survival entrepreneurs' (Gilad and Levine, 1986; Amit and Muller, 1995; Light and Rosenstein, 1995; Block and Wagner, 2006; Bhola *et al.*, 2006; Hessels *et al.*, 2008; Thurik *et al.*, 2008; Block and Sandner, 2009).

Opportunity entrepreneurs are self-driven workers that perceive entrepreneurship as an opportunity to voluntarily pursue for self-fulfilment and for financial profits (Reynolds *et al.*, 2002, 2005; Block and Sandner, 2009). The main difference between necessity and opportunity entrepreneurs is the motivation to start the business, relating to the push and pull motivation (Block and Wagner, 2010).

Studies showed that both types of entrepreneurs differ in their motivations, socio-economic characteristics, impact on economic development, business success, overall job satisfaction, human capital endowment and the strategies they follow through work (Acs and Varga, 2005; Bergmann and Sternberg, 2007; Block and Koellinger, 2009; Block and Sandner, 2009; Block and Wagner, 2010; Kautonen and Palmross, 2010; Block *et al.*, 2014). More likely necessity entrepreneurs tend to not employ staff, not last long in running the business, have higher probability to switch to paid employment, are monetary driven, have low opportunity costs and are less likely to foresee the future (Amit *et al.*, 1993; Granger *et al.*, 1995; Block and Sandner, 2009; Block and Wagner, 2010). Whereas opportunity entrepreneurs are more likely to have planning advantages that help them exploit better opportunities, generate more profits, increase business start-up performance and sustain longer in the market (Delmar and Shane, 2003; Block and Wagner, 2010). Thus, many academics (e.g. Acs and Audretsch, 2005; Acs and Varga, 2005) suggest that a higher rate of opportunity entrepreneurs is preferable than necessity entrepreneurs (Sternberg *et al.*, 2006), whereas the latter are regarded as less successful and desirable from an economic perspective (Acs and Audretsch, 2005; Acs and Varga, 2005).

A large part of the literature is focused on each group's impact on economic growth, but given the lack of longitudinal data, the discussion regarding the economic performance remains incomplete (Wagner, 2005). A significant relationship between national levels of opportunity entrepreneurs and economic growth is found (Reynolds *et al.*, 2002; Acs and Varga, 2005; Acs and Audretsch, 2005), whereby countries with a low ratio of opportunity to necessity entrepreneurs also have a lower GDP per capita. Considerably, the growth aspiration between necessity and opportunity entrepreneurs differs, with opportunity entrepreneurs creating more jobs than necessity entrepreneurs (Reynolds *et al.*, 2002), and the average of

opportunity entrepreneurs (6 percent) in the Global Entrepreneurship Monitor countries is higher than that of necessity entrepreneurs (only 2 percent) (Acs and Audretsch, 2005).

Although the literature on the heterogeneity of self-employed and entrepreneurs is already substantial, we aim to shed light on a new subgroup of self-employed relevant to the outcome of the labour market and evident in our observed study. We create a new division that differentiates those who sustain from those who move between self-employed and employee jobs, and links with the notion of necessity and opportunity entrepreneurs and the push and pull model. In the following chapters of this thesis we validate our approach and the rationale behind our division criteria, to understand more the nature of work and the characteristics of workers in self-employment, to test the educational theories and to compute the earnings returns to education for our division and to observe the changes in the transition behaviours over the time. Our objective is to offer a better approximation to the labour market that help us understand the changes in the world of work and the reasons behind such unique dabbling pattern between labour market states.

Chapter 3: Division and Characteristics

3.1 Introduction

In this chapter, we develop a new categorisation of self-employed workers in the UK labour market. We distinguish between three types of workers apparent in our data; the 'paid employees' who are observed only in paid employment during their total employment time. The 'sustained self-employed' who for most their employment time are seen in self-employment and the 'dabbled self-employed' who are considered at the margin between self-employment and paid employment. We explain how the division criteria between the three identified types of worker in our sample is established and the rationale behind it. We explore the socio-economic and demographic characteristics of our respondents. We first look at the propensity of characteristics of individuals who identify themselves as self-employed and as paid employees in our sample, without considering any heterogeneity within or among workers in our data and then compare with the findings of our division; the sustained self-employed, the dabbled self-employed and the always employees. We are specifically interested in finding whether those who are at the margin of self-employment and paid employment (the dabblers) have characteristics more closely aligned with wage earners or self-employed workers, to assess the nature behind their dip-in and out behaviour and their propensity to which type of employment.

The self-employed are viewed as a stock of measure that has a strong dynamic/churn aspect, where it contains workers who are temporarily in that 'state', moving in and out, whilst others are more attached to self-employment and continue to engage in it. Hence, there is a dearth of literature tackling the issue on the heterogeneity of self-employed workers, and many divisions have been formally made in respect to the push and pull model, also towards the negative and positive motivations (Amit and Mueller, 1995; Johansson, 2000; Reynolds *et al*., 2002; Parker, 2004; Carey *et al*., 2007; Muehlberger, 2007; Dawson *et al.*, 2009; Parker, 2009).

Many academic discussions focused on each group's impact on economic growth and job creation, from an essentially important macro perspective (e.g. Weenekers *et al*. (2005); Wong *et al*. (2005)). Others analysed the heterogeneity between the divisions made, especially regarding the formulation of intention and motivation behind the choice of employment, from a micro perspective (e.g. Block and Sandner (2009); Block and Koellinger (2009); Dawson *et al*. (2009); Block and Wagner (2010)).

But as far as the literature has surveyed, findings did not illustrate the differences between individuals who tackle self-employment temporarily, who dip in and out of self-employment, and who are at the margin between self-employment and paid employment, from workers who continue to pursue self-employment for a longer period. In this chapter, we attempt to capture this effect by exploring a new division into self-employment, the self-employed dabblers and self-employed sustainers. We theorise about the differences between both subgroups of self-employed and paid employees, and test whether these differences really exist from a micro perspective. Since there is no comprehensive theory on the distinction criteria established between the dabbled and the sustained self-employed, some parts of this chapter are exploratory and descriptive in nature.

We employ a multivariate framework, the Multinomial Logit Model, to account for the variations in the observed socio-economic and demographic characteristics between our group of workers. We use an amalgamated dataset; the British Household Panel Survey (BHPS) and its successor the United Kingdom Longitudinal Study (UKHLS), where we observe and follow the same respondents in the UK labour market, from 1991 till 2014, with missing year 2009. We utilise the number of observations spent between the four labour and non-labour market states identified in these surveys (paid employment, self-employment, unemployment and inactivity) as selection criteria for the dabbled self-employed, sustained self-employed and always employees. We are mainly interested in finding out how and in what our group of

workers (the dabbled self-employed, the sustained self-employed and paid employees) differ with respect to their observed socio-economic and demographic characteristics.

Hence, we address four main research questions in this chapter:

- What are the respective socio-economic and demographic characteristics for the amalgamated groups of self-employed and paid workers in the sample?
- How do these characteristics differ for our division of workers; the self-employed dabblers, the self-employed sustainers and the always employees?
- Which group of workers has generally more advantaged attributes?
- Do the dabblers have characteristics more aligned with the self-employed or with the paid workers?

Our study contributes to earlier work in micro-econometric evidence on the distinctions in self-employment. Where we objectively discuss how the classification between the dabbled and the sustained self-employed is established in our study and the rationale behind it. We empirically show how the two subgroups of self-employed are different with respect to their observed socio-economic and demographic characteristics and bring key insight into a group who have not been separately identified in the labour market to date; the Self-employed dabblers.

This chapter proceeds as follows. Section 2 relates the concept of the dabbled and sustained self-employed to the literature on the distinctions between the self-employed and entrepreneurs, the necessity and opportunity entrepreneurs, the push and pull model, the self-employed with and without employees, the entrepreneurial pipeline, and the notion of hybrid entrepreneurs. In this section, we also derive and develop the hypotheses to be tested. Section 3 describes the data and variables used, explains how the division is constructed, provides summary statistics and presents the econometric approach. Section 4 reports and discusses the results and section 5 provides a conclusion for this chapter.

3.2 Literature

3.2.1 Divisions in self-employment

The major difference between the self-employed and paid employees was explained through case laws and relies on the nature of contract signed (Freedman, 2001), whereby the self-employed sign a contract for service, and the paid employees sign a contract of service detailing the employee and employer relationship (Urwin, 2011). Despite this usual and simple manner of distinction, there still exists a clear grey area between both groups of workers. Because workers are not all the time committed to self-employment nor to paid employment, they can transit between both types of work over time and can practice both jobs at the same time.

Bearing this in mind, there are also problems in the identification of workers within self-employment, as previous studies looked at the self-employed as a homogeneous group of workers with a stable set of attributes (Meager, 2007). However, they differ in respect to their socio-economic and demographic characteristics, human capital accumulation, motivations, attitudes and reasons behind their choice of work, with all varying over time (Block and Wagner, 2010). Some enter for positive reasons and motivations and are pulled into self-employment, while others are influenced by negative and push factors that force them to choose this type of employment (D'Arcy and Gardiner, 2014). Later work stressed this point on the heterogeneity within self-employment, by looking at various divisions, such as the difference between the self-employed and entrepreneurs (Blanchflower, 2000, 2004), the push and pull entrepreneurs (Dawson and Henley, 2012), the necessity and opportunity entrepreneurs (Block and Sandner, 2009; Block and Wagner, 2010; Fossen and Buttner, 2013), the self-employed with and without employees and the formation of the entrepreneurial pipeline (Lazear, 2002;

Urwin and Buscha, 2012), and the notion of hybrid entrepreneurs that combines both paid and self-employment jobs together (Solesvik, 2017).

3.2.1.1 Self-employed versus Entrepreneurs

The first division questioned to what extent self-employment might reflect the true level of entrepreneurship (Dawson *et al*., 2009), where the concepts of self-employed and entrepreneurs are not the same despite some overlaps in the literature (Startiene˙ *et al*., 2010). The former is the simplest type of entrepreneurs that do not innovate, but bear income risk (Spence and Gomez, 2004). It is an aspect of entrepreneurship but cannot capture the whole level of innovation and the size of economic growth of the enterprise (Glaeser *et al*., 2010). Nevertheless, there are still problems in identifying entrepreneurs, establishing boundaries in entrepreneurship and what precisely is entrepreneurship (Parker, 2002a), whereas it is easier to define the terms self-employed and self-employment, but even here there are measurement problems and disagreements (Parker, 2004).

3.2.1.2 Push versus Pull Entrepreneurs

The second division relates entrepreneurs to the "Push" and "Pull" model (Dawson and Henley, 2012), whereby "push" entrepreneurs are forced to become entrepreneurs out of inevitability, and because of negative reasons, factors and motivations. Where "pull" entrepreneurs are self-driven by positive factors, motivations and favourable labour market conditions (Block and Wagner, 2010), Ritsilä and Tervo (2002) defined "push-entrepreneurs" as individuals who in the absence of personal unemployment would not start their own business. But it is very difficult to distinguish between these two subgroups of workers when the 'push' and 'pull' motives clash together at the same time, due to workers' heterogeneity and reporting the presence of both factors when influencing their decision to become self-employed (Dawson *et al.,* 2009; Dawson and Henley, 2012).

3.2.1.3 Necessity versus Opportunity Entrepreneurs

The notion of opportunity and necessity entrepreneurs is like those of the push and pull model in pursuing entrepreneurial activity (Amit and Muller, 1995). In 2001, the Global Entrepreneurship Monitor (GEM) distinguished between two types of entrepreneurs: opportunity and necessity entrepreneurs because of their increasing relevance, importance, differences and because of the targeted policy initiatives (Sternberg *et al.*, 2006; Meager, 2007; Reynold *et al.*, 2002). Opportunity entrepreneurs start their business to pursue an opportunity and necessity entrepreneurs start because of the need to do so (Reynold *et al.*, 2005; Block and Wagner, 2010).

Block and Wagner (2010) theorised about the differences in the characteristics, abilities and exploitation of opportunities between necessity and opportunity entrepreneurs and attempted to justify these dissimilarities in theory and practice. They implemented a more specific definition that is quite like the GEM definition but different from the 'push' and 'pull motives. They focused on the ways entrepreneurs came to entrepreneurship, and the circumstances that made them leave their previous work. Using the German Socio-Economic Panel Study, from the years 1984 to 2004, they selected persons who were self-employed in the sample, excluded serial entrepreneurs after their first entrepreneurial activity, those who worked in family owned businesses, workers from former East Germany and respondents with observations exceeding the two years' interval in which the termination of the last job occurred. The rationale behind their adoption is to not mix the motives behind self-employment decision and to not have confounding effects related to the macro-economic conditions related to East Germany. Their findings showed that both subgroups differ in their human capital, where opportunity entrepreneurs exploit more profitable opportunities than necessity entrepreneurs (Block and Wagner, 2010).

Hence, the start-ups out of unemployment are shown to have a significant lower survival rate than other start-ups (Pfeiffer and Reize, 2000). They often occur in industries with low market entry barriers and low capital requirements and are smaller and to have a slower pace of growth than other businesses (Brüderl *et al*., 1996). More often these ventures are characterised by lower number of employees and are one-person start-ups (Block and Wagner, 2006).

3.2.1.4 Entrepreneurial Pipeline, Self-employed with and without employees

The entrepreneurial pipeline is the transition of workers from being solo self-employed to being self-employed with employees (Urwin and Buscha, 2012). Lazear (2002) claims that the self-employed without employees tend to be less skilled than employers of large business, but still need to know about the process of business set-up and how goods and services are produced and delivered to customers. Whereas, Startienė, Remeikienė and Dumčiuvienė (2010) argue that the solo-self-employed require more skills and knowledge than entrepreneurs with employees, as the burden of the whole business lies on them (Startiene *et al*., 2010). It is worth noting that the UK is characterised by the highest proportion of self-employed without employees in comparison to other European countries (Urwin and Buscha, 2012; D'Arcy and Gardiner, 2014; Deane, 2016). Hence, the present "one size fits all" policies approach that target entrepreneurship do not work equally on both types of self-employed.

3.2.1.5 Hybrid Entrepreneurs

Hybrid entrepreneurs combines entrepreneurship and employment (Solesvik, 2017). This form of entrepreneurship is particularly popular among highly educated professionals in knowledge-intensive and innovative industries (Folta *et al*., 2010; Petrova, 2012), where it provides an attractive bridge for workers having difficulties in dropping their waged work and starting their own work (Smallbone and Welter, 2001). Also, it is a good way for workers who are risk averse to realise their entrepreneurial intention. But the literature reveals some inconsistency in the

definitions related to hybrid entrepreneurship, as some define them as workers who mix their time in self-employment and paid employment (Folta *et al*., 2010). Others identify them as "part-time entrepreneurs" (Petrova, 2012), without even implying that they engage in paid employment (Schulz, Urbig and Procher, 2016), and some refer to them as individuals who start firms and combine profit with non-profit activities (Battilana *et al*., 2012).

Solesvik (2017) argues that these groups of workers should be considered as a homogenous group, because one can stay in full time employment and the other in full time self-employment. However, Schulz, Urbig and Procher (2016) argue that this group of workers is not homogenous, as some are more highly educated than others and act differently to their less educated counterparts. Hence, they call for more research exploiting the different types of hybrid entrepreneurs.

3.2.1.6 Limitation of the Divisions

Despite all these divisions, the literature fell short on an important specification of self-employed workers; differentiating those who sustain in self-employment from those who move between self-employment and employee jobs. This chapter starts with the process of splitting the self-employed into two groups of workers and differentiating them from those who only engage in wage employment. The dabbled self-employed are workers who dip in and out of self-employment and who are at the margin between self-employment and paid employment. And the sustained self-employed are workers who engage most of their employment time in self-employment and who sustain longer than the dabbled self-employed in this type of work. The attempt here is to create a new categorisation of the self-employed in the UK that represents the actual scene in the labour market, and to unravel the ambiguity in earlier distinctions made between the different subgroups within self-employment and between paid employment based on the observed persons' socio-economic and demographic characteristics.

3.2.2 Division and Hypotheses formulation

The rationale behind this new categorisation is that workers who dabble in and out of self-employment exhibit different sets of behaviours to workers who sustain longer in that state, and are different with respect to their observed socio-economic and demographic characteristics, earnings' returns to human capital and labour market transitions, from the sustained self-employed and paid workers who only engage in wage employment (the always employees). Hence, in this first empirical chapter we establish the division criteria and explore the observed differences in the observed characteristics for our division of workers. We leave the computation of earnings returns, and the analysis of labour market transitions for the next empirical chapters (chapters 4 and 5) of this thesis.

We define dabblers/ self-employed dabblers/ dabbled self-employed as workers who engage in self-employment for a short period of time, then switch to paid employment or vice versa. Hence, they are considered at the margin of self-employment and paid employment. In contrast, the sustainers/self-employed sustainers/sustained self-employed are workers who continue in self-employment for a longer period. Because they spend more time in this form of work, we consider them as more established and attached to self-employment than dabblers, where they run larger enterprises and might have additional staff members. Thus, the time seen in self-employment plays a crucial role in the distinction between these two sub-groups of self-employed. It signifies as the learning process by which workers learn more about their abilities over time and discover whether they have the appropriate skills to continue as self-employed, or if they fail to do so (Jovanovic, 1979, 1982; Urwin, 2011).

We argue that because dabblers cannot ensure any persistency in self-employment nor in paid employment, we can see them as negatively motivated workers who involuntarily choose to enter self-employment, considering this type of work as a last resort because of the high barriers to entry in paid employment. They are more likely to resemble the previous

definitions of self-employed, as well as push and necessity entrepreneurs, because we do not see them for long in self-employment. Also, they are more likely to stand out as sole self-employed without employees that mix between paid and self-employment jobs, but represent the less educated groups of hybrid entrepreneurs, who unwillingly choose to engage in both jobs because they need to and not because they want to. Hence, we consider them to be marginalised in society, and we relate them to Weber's (1930) disadvantaged theory and Light's (1972) cultural theory (explained in chapter 2 of this thesis). We expect them to be misfit workers with less advantaged attributes (members of ethnic minority groups, have culture and customs avoidance, experience language barriers, face poor credit access, etc.) and consider them to be pushed into self-employment. Thus, we predict that dabblers are different from the sustained self-employed with respect to their socio-economic and demographic characteristics, they fairly resemble regular employees, but are more disadvantaged in their attributes.

On the other hand, we observe sustainers for a longer time in self-employment and consider them to be more closely aligned and further attached and established compared to dabblers in self-employment. We assume that they are more likely to be pulled into self-employment, are positively motivated to enter this type of work and can expand their work and to take on additional staff members. Hence, they are more entrepreneurially oriented, and somehow like the pull and opportunity entrepreneurs, although it is very hard to identify if someone is an entrepreneur or not, and the level of innovation each person brings to the economy, to establish if there are any noticeable differences in the observed socio-economic and demographic characteristics between sustained self-employed, dabbled self-employed, is a vital starting point. We consider sustainers to be entrepreneurs rather than self-employed by being the highly talented and skilled workforce in the labour market, with respect to human capital accumulation and industry skill levels and with more aligned attributes with self-

employment. Thus, we would also expect them to have different characteristics from workers who we only see engaging in paid employment.

Hence, we hypothesise that:

1. Hypothesis 1: Dabblers are different to Sustainers in their socio-economic and demographic characteristics.
2. Hypothesis 2: Dabblers are like Employees in their socio-economic and demographic characteristics but have fewer advantaged attributes.
3. Hypothesis 3: Sustainers are dissimilar to employees in their socio-economic and demographic characteristics.
4. Hypothesis 4: Sustainers have more advantaged attributes and are aligned with self-employment as opposed to dabblers.

As noted earlier, this chapter is very exploratory in nature. As an *a priori*, it is unclear whether those who are on the margins of self-employment and paid employment (the Dabblers) will have characteristics that are more closely aligned with employees or the self-employed. If we find that dabblers are particularly disadvantaged in terms of their socio-economic and demographic characteristics, the suggestion would seem to be that they oscillate between these two labour market states because they are unable to sustain in one or the other form of work (self-employment or paid employment). This perhaps reflects a more general lack of employment or labour market insecurity and deficiency in the economy. On the other hand, if we see a more advantaged group of labourers according to some key characteristics, the implication is that we may have a group who control a sequential portfolio of working, potentially making the most out of self-employment and employment job opportunities as they arise and reflecting a labour market of sorts. Furthermore, we may find that dabblers are simply the younger versions of those who become sustained self-employed. In this way, one can see our work as being in line with Urwin and Buscha's (2012) work on the 'entrepreneurial

pipeline' in relation to how the solo-self-employed become self-employed with employees. Instead, we relate it to how dabblers become sustainers in self-employment. Otherwise, we may also find that dabblers are simply trying both types of employment to see what best suits their skills or preferences, because their agile way of working helps them learn more about their abilities and their likes and dislikes in the job market. However, it is difficult to capture this dynamic pattern in our data, but we attempt to tackle this issue in chapter 5 of this thesis, where we look at their transition behaviour in the labour market prior to and after the 2008 financial crisis.

This analytical chapter sheds new light on several important academic and policy debates, arising from the creation of a new distinction in self-employment. We identify a new heterogeneity in self-employment that captures the dip-in and out behaviour of workers in this employment status and provides a more realistic approximation of what we observe in the labour market. But it is worth noting that the work on self-employment is associated with some degrees of uncertainty and lack of information, because it is not possible to assign probabilities on the selection into entrepreneurial activities (Knight, 1921; Blanchflower and Oswald, 1998). Also, self-employment is episodic, and the theoretical arguments that rely on stable sets of attributes for individuals are bound to be incomplete, because factors that lead to self-employment might change at different points of time (Glenn and Elaine, 1987 p:8). However, we are determined in establishing an adequate distinction within self-employment and between paid employment and in exploring the differences in the socio-economic and demographic characteristics of workers that we observe for over twenty-three years, to help us identify how and in what the self-employed workers are different from paid workers and within each other.

3.3 Data and Variables

3.3.1 Data

3.3.1.1 British Household Panel Survey (BHPS)

The investigation is carried out using a combination of surveys, the British Household Panel Survey (BHPS), interviewing UK respondents from 1991 until 2008, and the United Kingdom Household Longitudinal Study (UKHLS), its successor, following the same members throughout an extended period, from 2010 till 2014 (most recent release).

The BHPS is a secondary micro panel data, yearly conducted by the Economics and Social Research Council (ESRC), the United Kingdom Longitudinal Studies Centre (ULSC), and the Institute for Social and Economic Research (ISER) at the University of Essex (Taylor *et al*., 2010). This dataset surveys more than 5,500 households, and interviews successively, on a yearly basis, circa 10,000 individuals aged 16 and above, using a Computer Assisted Personal Interview (CAPI) (Lynn, 2006; Blanden *et al.,* 2010). It started in 1991 with interviewing households in Great Britain, where the selection of residential addresses was clustered and stratified with some additional subsamples being added throughout the waves. In wave 7 (year 1997 of the study), the BHPS began providing data for the United Kingdom European Community Household Panel (UKECHP), with the original subsample of UKECHP being kept, including all respondents from Northern Ireland, and 'low-income' families of Great Britain. But, the ECHP ended in wave 11 (year 2001) and no alternative samples were found (Taylor *et al*., 2010). Instead, extension samples from Scotland and Wales (1,500 households each) were added in wave 9 (year 1999) and a similar sample boosting from Northern Ireland (2,000 households) was integrated in wave 11 (year 2001) along with youth and child interviews being added in wave 4 (year 1994) and wave 12 (year 2002) (Taylor *et al*., 2010), summing up to approximately 8,144 households and 20,177 individuals being followed throughout the last wave. The households' extensions occurred for two main reasons:

first, to increase the small sample size of the Scotland, Wales and Northern Ireland responsiveness, to allow an independent analysis of these countries, and second to have wider coverage of the UK and not only Great Britain (Taylor *et al*., 2010). However, the drawback of boosting the sample size is the higher selection probability that may lead to bias estimates.

3.3.1.2 United Kingdom Longitudinal Study (UKHLS)

Similarly, the UKHLS is a secondary micro panel dataset, funded by the ESRC and multiple government departments and conducted by the ISER of the University of Essex, the University of Warwick, and the London School of Economics (Knies, 2015 p:7). This longitudinal survey has a wider geographical coverage that follows around 40,000 household members in the whole United Kingdom, on a yearly basis, from 2009 until the most recent release in 2014. It is considered one of "the largest panel surveys in the world" (Knies, 2015). Like the BHPS, the interviews are carried out face to face via CAPI, by trained interviewers to guarantee a high standard of longitudinal datasets and are intended to be representative of the UK population since 2009. The UKHLS sample consists of a new larger sample, the General Population Sample (GPS), a subset for General Population Comparison (GPC), an Ethnic Minority Boost Sample (EMB), the former BHPS sample and The UK Innovation Panel sample (IP) (Knies, 2014 p:8). The GPS sample is based on an initial sample of 49,950 households located in England, Scotland, Wales and Northern Ireland. It is a random subsample of 40 percent of the GPS from one sample address. The EMB sample consists of higher proportions of individuals from five ethnic minority groups: Indians, Pakistani, Bangladeshi, Caribbean and African, around 1,000 individuals each. They are only located in Great Britain and are identified using sampling, randomising and screening procedures, along with adequate methods for statistical efficiency (Berthoud *et al.,* 2009; Knies, 2014 p:9). The IP surveys around 1,500 households annually and is randomly selected to help develop new areas of research and new methods for data collection.

The second wave sample of the UKHLS includes additional subsamples of all former members of the BHPS, who were previously active in the last wave in the BHPS (wave 18, year 2008) and who still agree to be a part of the UKHLS (Knies, 2015). All BHPS members are followed within the UKHLS if they remain in the UK. The UKHLS is issued over 24 months of the waves. Only the former BHPS and the Ireland sample are issued in their first 12 months of waves, where the data collection focused on assessing any problems with integrating previous members from the BHPS (Knies, 2014 p:11). The survey followed household members who were part of the BHPS between 1997 and 2001, and the ECHP. Wave 1 was conducted via telephone interviews and out of 271 households only 91 were interviewed, while wave 2 (year 2010), 3 (year 2011), 4 (year 2012), 5 (year 2013) and 6 (year 2014) followed the normal procedures of the pilot study (Knies, 2015 p:14).

Since the first wave in the UKHLS did not incorporate the former BHPS household members, there are evident variations in the reference period for the continuing BHPS sample members between 13 months to 27 months, from wave 18 (year 2008) in the BHPS, to wave 2 (year 2010) in the UKHLS (Knies, 2014 p:45-46), with the level of non-contact and untraced movers higher than before (Knies, 2015 p:20).

3.3.1.3 BHPS and UKHLS

Both panel datasets are designed to help us understand the changes in the economic and social environment of individuals, and to comprehend the effect of policy interventions on the general wellbeing of the UK nation (Knies, 2014). These surveys contain a large amount of information on individuals' socio-economic and demographic characteristics that allow the analysis of those individuals' lifetime events, conditions, behaviours and experiences. Also, it makes it possible to observe a person's responses to changes in their socio-economic environment, to distinguish between the "inter" and "intra" individuals' differences, their lifecycle events, and to control for unobserved time-invariant heterogeneity which is often hard

to detect in cross-sectional models (Taylor *et al.*, 2010; Knies, 2014). Hence, both datasets provide a richer set of control variables that are not available in other datasets and allow a wider research range in a variety of topics (Angrist and Pischke, 2009; Taylor *et al.*, 2010; Knies, 2014). By combining both surveys, it makes it possible to trace one's labour market history and movement for almost twenty-three years. This allows the data to provide more accurate and unique information on household members' formulations, dissolutions, history, on interactional changes at the individual level, and to acquire further understanding by the analysis of the economic and social changes of individuals in UK households (Taylor *et al.*, 2010). Accordingly, the BHPS and the UKHLS are considered as representative of the United Kingdom's population between the years 1991 and 2014. The nature of the panel data is designed in a way to help us understand the changes in the economic and social environment of individuals and to comprehend the effect of policy interventions on the general wellbeing of the UK nation.

However, both surveys come with complex designs, and when combined the non-response adjustments become more complex compared with other surveys, given the large number size of households (Knies, 2014 p:59). Also, these surveys are not administrative in their nature, as gathered information is largely based on self-reporting (Long, 2009 p:49). Panel datasets may suffer from problems of design, non-responses, methods of collection, measurement errors and sample selection that exhibit bias results (Wooldridge, 2005). The use of post-stratification methods and weighting procedures are intended to correct the known dissimilarities between the sample and the population, to ensure equal probability of selection and unbiasedness. However, the weights calculations become complicated, unclear and very time consuming especially when attrition weights are employed. This results in a huge decrease in the sample size, and a drop-in respondent when missing from a single wave (Kish, 1990; Gelman, 2007). In addition, not all weights are equivalent to the inverse probabilities. Some

are based on non-response adjustments and combinations of probability calculations. Others are not constructed on individual units, but rather on the whole survey with some sampling weight probabilities being fixed and independent of the sample (Gelman, 2007 p:155-156). This makes the standard errors of weight estimates more difficult to evaluate, and the resulted variances to be high (Gelman, 2007 p:163). Furthermore, ethical issues may arise due to the misuse of these weights to produce subjective desirable results (Sharot, 1986). This is when regression modelling represents a more attractive alternative to weighting (Gelman, 2007 p:153). Thus, we restrain from using the weighting methods, especially in our case when merging the BHPS survey with the continuing members in the UKHLS, because we have missing values for the year 2009 and some of our members decide to leave and later return to the survey. Hence, we do not want to risk losing many workers in our sample.

Table 3.1 below reports the number of individual observations for each wave for the combined BHPS and UKHLS sample, showing the number of Original Sample Members (OSMs), Permanent Sample Members (PSMs) and Temporary Sample Members (TSMs) from wave 1 to 18 (years 1991 till 2008) using the BHPS, and wave 20 to 24 (years 2010 till 2014) using the UKHLS, with missing data for wave 19 (year 2009). The OSMs are all initial household members selected at wave 1 of the BHPS, the Scotland and Wales boosting sample in wave 9, the Northern Ireland respondents in wave 11, and siblings of OSM mothers and fathers (Knies, 2014, p:10). Similar criteria for OSM identification is followed for the former BHPS sample in the UKHLS, but a restriction is imposed to consider children born as OSMs if only coming from OSM mothers and no longer from OSM fathers. The OSMs at all ages are followed for interview if they remain resident in the UK and are eligible sample members of the life survey (Knies, 2014 p:10). The PSMs are all people listed in the households who were interviewed in wave 1. They are followed throughout the whole sample even if they no longer live with an OSMs. TSMs are any new members who were not selected in the original sample

and are found to be co-resident in an OSM or PSM's household, after wave 1 (Knies, 2017). They remain in the BHPS if they share the household with OSMs. But "One complication is that TSM may be reclassified to PSMs if they have a child with an OSM" (Lambert, 2006 p:11).

As shown from the table below, the number of OSMs who we follow over the years (23 waves) decreases in the UKHLS sample, starting with 10,264 respondents in year 1991 in the BHPS, to 7,650 respondents in year 2014, in the UKHLS. This is due to many dropping out of the survey and not wanting to continue in the UKHLS. For this reason, we did not use any attrition weights, as we are keen to observe the highest number of panellists.

Table 3.1: *Number of Individual Observations in each wave of the BHPS and UKHLS*

BHPS	Year	OSMs	PSMs	TSMs	Total
wave 1	1991	10,264	0	0	10,264
wave 2	1992	8,734	10	443	9,187
wave 3	1993	8,318	28	596	8,942
wave 4	1994	8,033	76	739	8,848
wave 5	1995	7,714	116	767	8,597
wave 6	1996	7,711	170	886	8,767
wave 7	1997	9,054	229	998	10,281
wave 8	1998	8,767	279	964	10,010
wave 9	1999	13,215	346	964	14,525
wave 10	2000	12,915	342	964	14,221
wave 11	2001	15,618	328	1,439	17,385
wave 12	2002	13,536	301	1,366	15,203
wave 13	2003	12,974	289	1,421	14,684
wave 14	2004	12,492	280	1,493	14,265
wave 15	2005	12,097	272	1,615	13,984
wave 16	2006	11,799	263	1,700	13,762
wave 17	2007	11,319	259	1,699	13,277
wave 18	2008	10,729	253	1,488	12,470
UKHLS					
wave 20	2010	10,012	760	1,008	11,780
wave 21	2011	9,368	714	885	10,967
wave 22	2012	8,654	668	770	10,092
wave 23	2013	8,185	630	731	9,546
wave 24	2014	7,650	577	642	8,869
Total		239,158	7,190	23,578	269,926

Source: BHPS & UKHLS

Table 3.2: *Transition Matrix by gender between 1991 and 2014 (BHPS year 1991-2008 and UKHLS year 2010-2014), Average Row Percentages*

	Labour market status in year 2014					
Labour market status in year 1991	Self-employed	Employees	Unemployed	Retired	Inactive	Total Observations
Men						
Self-employed	82.71%	12.21%	1.76%	2.23%	1.10%	12,117
Employees	2.93%	91.61%	2.44%	1.72%	1.31%	56,683
Unemployed	5.90%	29.46%	47.17%	4.56%	12.91%	5,088
Retired	0.45%	1.23%	0.37%	96.15%	1.80%	21,220
Inactive	1.25%	13.55%	7.46%	6.36%	71.38%	10,515
Total observations	12,208	56,590	4,859	22,548	9,418	105,623
Women						
Self-employed	74.19%	16.02%	1.37%	2.72%	5.71%	4,673
Employees	1.45%	89.64%	1.56%	1.88%	5.48%	60,646
Unemployed	1.98%	32.82%	28.00%	3.58%	33.62%	3,132
Retired	0.17%	0.85%	0.14%	93.45%	5.40%	29,212
Inactive	1.19%	15.15%	3.90%	7.73%	72.03%	28,956
Total observations	4,807	60,805	3,058	30,924	27,086	126,619

Source: BHPS & UKHLS

Table 3.2 above represents the transition matrices of our working sample and shows the average movement rates from years 1991 till 2014, by gender, between five distinct labour markets states in the combined BHPS and UKHLS datasets. The five labour market states considered in the analysis are: self-employment, employment, unemployment, retirement and inactive status. The self-employed are respondents who declare their main labour market activity in self-employment. The same consideration goes for those who classify themselves as paid employees. The unemployed are individuals who are not currently working but are available and in search for work. The retired are workers who previously retired from employment at either young or late age. The economically inactive are either still in full time education, women on maternity leave, the long-term sick, or persons on government training schemes. The definitions in this study are based on the BHPS classification and are not consistent with the International Labour Organisation (ILO) classification (Long, 2009 p:49). Thus, respondents self-classify themselves based on their own perception of the nature of their

work, without being provided with definitions to distinguish between different occupational status, and not carrying out any check-ups on their self-classification questions (Ormerod, 2007 p:51).

Table 3.2 illustrates self-employment as a less stable state when compared to paid employment for both genders in our sample (82.71 percent of self-employed men and 74.19 percent of self-employed women, compared to a persistent rate of 91.61 percent of paid employed men and 89.64 percent of paid employed women, who remain in their own mentioned employment state, between the years 1991 and 2014). Between unemployment, inactivity, retirement and paid employment, the unemployed have the highest average yearly transition rates into self-employment among the three other states (5.90 percent and 1.98 percent of unemployed men and women, respectively, enter self-employment on average on a yearly basis), followed by up-comers from wage employment (2.78 percent of male and 1.45 percent of female wage earners). We observe the lowest percentage of transitions into self-employment from inactivity (1.25 percent of men and 1.19 percent of women) and retirement (0.45 percent of men and 0.17 percent of women). Our results are consistent with the findings of Light (1980), Evans and Leighton (1989) for the case of the United States, Carrasco (1999) for the case of Spain and Taylor (2001, 2004) for the case of the UK. These studies showed that the highest transitions into self-employment come from the unemployed workforce. But it is important to distinguish between genders when looking at the transition moves in self-employment, as the intuition behind the increase in this labour state is different between women and men. For women, it is due to an increase in retention rates in self-employment (e.g. Kuhn and Schuetze (2000) for the case of Canadian self-employed women), whereas for men most of the increase is attributed to a decrease in stability in paid employment (e.g. Blanchflower and Freeman (1994) for British evidence).

Similarly, the transitions into paid employment follow a similar pattern as self-employment, with the unemployed recording the highest average yearly transition rate between the years 1991 and 2014 (29.46 percent for men, and 32.82 percent for women), followed by the self-employed (12.21 percent of men and 16.02 percent of self-employed women), the inactive (13.55 percent of men and 15.15 percent of women) and lastly the retired workers (1.23 percent of men and 0.85 percent of women).

The uppermost yearly average migration from self-employment goes into paid employment for both genders (12.21 percent of previously self-employed men in 1991, and 16.02 percent of previously self-employed women became paid workers in 2014). Then retirement (2.23 percent of male self-employed retired in year 2014), unemployment (1.76 percent of previously male self-employed in year 1991 are searching for other work in year 2014), and lastly in inactivity (1.10 percent exit the labour market in year 2014) for male respondents in our sample. As for female respondents, we notice a different transition outflow pattern towards inactivity (5.71 percent of previously self-employed women in year 1991 are outside the labour market in year 2014), then retirement (2.72 percent) and lastly in unemployment (1.37 percent).

The highest movement from paid employment between the four states goes into self-employment for the case of men (2.93 percent of previously wage earners in year 1991 become self-employed in 2014), and into inactivity for previously employed women (5.48 percent). This is conceivable as some women exit the labour market because of family responsibilities or are under maternity leave.

Nearly half of the unemployed men are still observed in unemployment on an average between the years 1991 till 2014 (47.17 percent). Followed in paid employment (29.46 percent previously unemployed men in 1991 are in paid employment in 2014), inactivity (12.91 percent), self-employment (5.90 percent), and lastly in retirement (4.56 percent). A different

pattern is observed for unemployed women, where the highest percentage (33.62 percent) become inactive, followed in paid employment (32.82 percent), unemployment (28 percent), retirement (3.58 percent) and lastly in self-employment (1.98 percent).

As for retired workers, the majority stay in retirement (over 96.15 percent of retired men and 93.45 percent of retired women), followed in inactivity (1.80 percent for men and 5.80 percent for women), paid employment (1.23 percent for men and 0.85 for women), self-employment (0.45 percent for men and 0.17 percent for women) and lastly in unemployment (0.37percent for men and 0.14 percent for women). Similar observations are also shown for the case of inactive respondents, where the majority continue to be outside the labour market (71.38 percent for men and 72.03 percent for women), followed by average yearly transitions between years 1991 till 2014 in paid employment (13.55 percent of men and 15.15 percent of women), but lastly in self-employment (1.25 percent of men and 1.19 percent of women, we see engaging in self-employment in 2014).

Hence, we notice from table 3.2 that not all workers throughout the years are observed in their initial economic status compared to when they were first interviewed. Respondents migrate differently from state to state and exhibit different transition behaviours between gender over the observed years. Thus, many workers whom are currently defined as paid employees, might have previously been self-employed. Similarly, those who are stated in self-employment might have engaged before in paid employment jobs, unemployment, retirement and inactivity and do not always continue in self-employment. Some might have switched to regular employment when alternative paid jobs became available. Others have failed and continued to search for work in the form of unemployed, or decided to retire, became inactive and dropped out from the labour force. Whilst certain business owners continue to run their own work. Similarly, not all paid employees continue to work in waged employment, some

search for better job opportunities, others are made redundant, reach retirement, leave the labour market and some decide to become self-employed.

Thus, the normal distinction that there are individuals who are defined as paid employees, and others as self-employed lacks precision, because of the pattern of transition within the self-employed, for those who are at the margin between self-employment and paid employment that has been not looked over to date.

3.3.2 Division Construction

This study contributes to a new division within self-employment by differentiating between workers who move between self-employment and employee jobs and endure in self-employment for a short period of time, and workers who sustain longer in self-employment. We identify workers who transit between paid employment and self-employment; dabble in and out of self-employment as dabblers. Those who we observe for a prolonged period in self-employment are labelled as sustainers, and workers who are only seen in paid employment are denoted as always paid employees.

The identification of dabbled self-employed, sustained self-employed and always employees follows specific criteria. The division is based on computing the total time respondents are observed in the sample, the frequency of observations in their current employment and non-employment status (self-employment and paid employment, unemployment and inactivity), their total employment time (total number of periods seen in paid employment and self-employment) and their proportions in self-employment and paid employment.

The frequency signifies the number of times workers are observed in their designated market status throughout the years in the dataset. We follow respondents for over twenty-three waves (wave 1 to 18 from the BHPS, and waves 20 to 24 from the UKHLS), thus the frequency of workers in self-employment can range from zero to twenty-three. The proportion in self-

employment is calculated by dividing the total number of times individuals are noted in self-employment over their total employment times (total time we observe them in either wage employment or self-employment). Similarly, the proportion in paid employment is calculated by dividing the total number of times individuals are observed as wage earner over their total employment times.

The identification excludes part-time jobs and respondents under age 16, since from the age of 16, respondents can leave compulsory schooling, and are entitled to earn the national minimum wage rate in the UK (gov.uk, 2014). We extend the age band to cover respondents over the age of 65 in our sample, like the work of Zissimopoulos and Karoly (2004, 2007) to take into account the expansion of the ageing population in the UK labour market, which is caused by longer life expectancy, the poorer level of pension savings, and the phasing out of the retirement age of 65, through the enforcement of the equality act for ageism in 2010 (The Equality Act, 2010; D'Arcy and Gardiner, 2014).

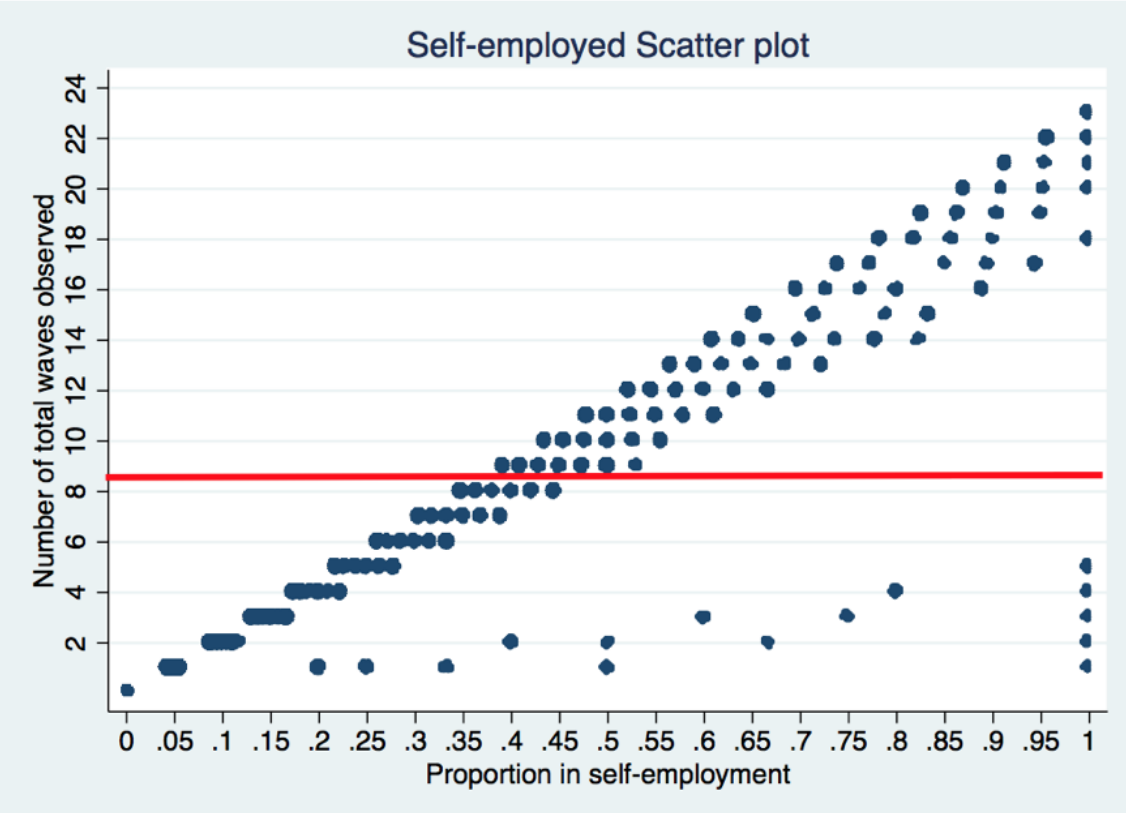
Individuals who are seen less than one-third of the time (one-third of twenty-three years/ less than 8 waves) in the sample, around 34.83 percent of the sample (6,229 out of 17,886 respondents) are disregarded in the categorisation, because no solid evidence could be provided over their occupational choice history as we do not observe them for long enough in our data. Workers with more than two spells of inactivity and/or unemployment are not included in this study in order not to question the motives behind their choice of profession. We acknowledge from the literature that prior experience in unemployment and economic inactivity affect positively on self-employment entry (Meager, 2007). But at the same time, the long spells of both decrease the probability of entering self-employment because unemployed and/or inactive workers face higher capital constraints in the labour market and are regarded to acquire lower levels of human capital and experience (Cowling and Mitchell, 1997). Finally, panellists with zero frequency and proportion in self-employment are excluded from the division of dabbled

and sustained self-employed because they do not relate with the purpose of the partition within self-employment. Whereas, we only regard workers as always employees if we observe them during their total employment time only in paid employment (proportion in paid employment is equal to one).

Figure 3.1 below reports the proportions of workers in self-employment and the number of waves observed throughout the study. It is important to acknowledge that workers with a proportion equal to one does not necessarily mean that they are seen throughout the whole period of the study (twenty-three years) as self-employed. This issue is visually documented in the below graph, on the y-axis, showing the total number of waves in which we observe our respondents in the sample. Where some workers have proportion equal to one in self-employment but are seen only four times in the whole-time of the study. Thus, this might provide a misleading interpretation of their economic status. For this reason, we choose to exclude workers who are seen less than one-third of the time in our sample, to be able to draw significant preference on workers' labour market history and preference. This is documented by the horizontal red line in figure 3.1 below, where we exclude workers who are seen in less than 8 waves in our sample.

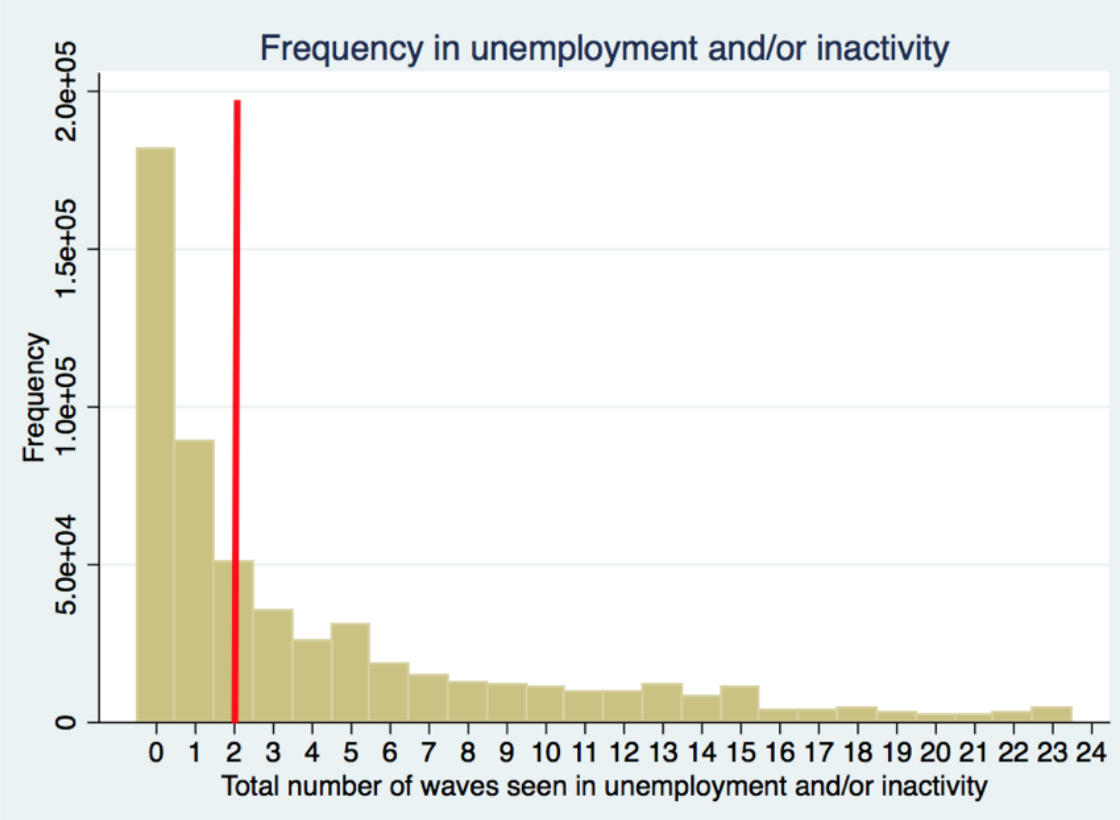
Figure 3.2 reports the frequency of respondents in unemployment and inactivity. We drop respondents with more than two spells of inactivity and/or unemployment because we do not want our division to be driven by these two labour and non-labour market status (this is shown in the below red vertical line in table 3.2). Although we might be risking the removal of a group of vulnerable people, our aim is to compare between similar groups of workers and to have a balanced partition within self-employment and between paid employment. Still, we redefine our division criteria without making any restriction on the number of times respondents are seen in inactivity and/or unemployment and compare the results with our main division for a robustness check.

Figure 3.1: Self-employment Scatter Plot



Source: BHPS & UKHLS

Figure 3.2: Histogram of total number of Unemployment and Inactivity spells.



Source: BHPS & UKHLS

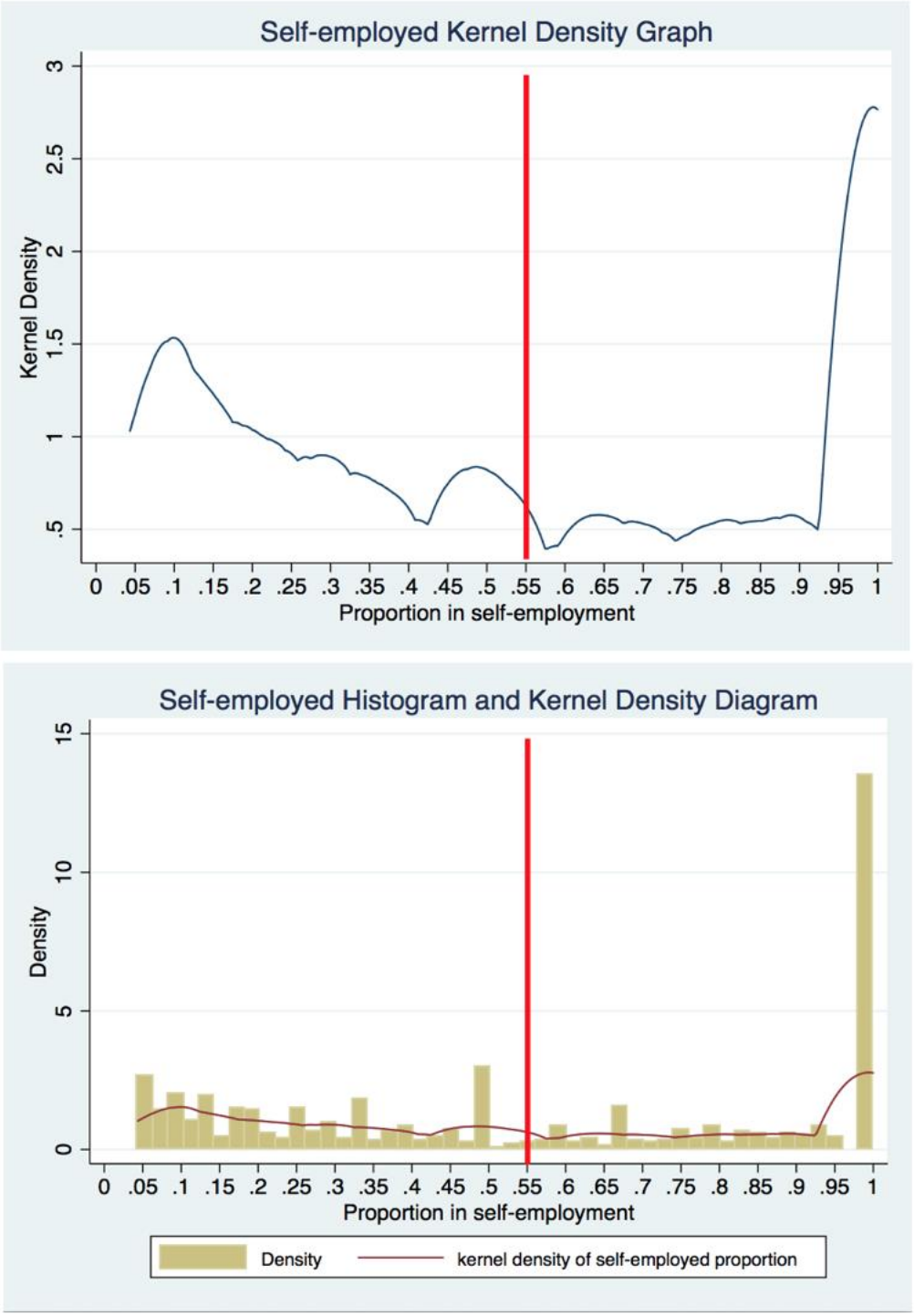
Recalling what has been discussed in earlier sections, the dabbled self-employed tackle self-employment for a short period of time, while the sustained self-employed workers persist longer in this type of employment activity. Hence, the frequency of times in self-employment and the total number of times observed in the dataset play an essential role in determining how this distinction is made, where both proportion values and frequency sums determine if labourers are identified as dabblers or as sustainers in the proposed division. For this reason, we identify dabblers as workers who are seen at least once in self-employment but less than 55 percent of their total employment time (total number of years spent in paid employment and self-employment), sustainers as being observed 55 percent of their total employment time and more in self-employment, and paid employees being seen 100 percent of their total employment time in paid employment only.

The below Figure 3.3 plots the kernel density and the histogram diagram for the self-employed proportions. The kernel density represents a smoother version of the histogram, giving more weight for the data at the closest point of evaluation (Cameron and Trivedi, 2010 p:63). As can be seen in the below figure, the trend of the self-employed proportion is quite unstable. It fluctuates in a decreasing manner between 0.05 and 0.55 proportion criteria. Despite the extended decreases after the 0.55 benchmark, the trend of self-employed proportion follows a steeper trend up until the significant jump from 0.92 level to reach a proportion equal to one. As such, we identify the 0.55 proportion as the cut-off point between the dabbled self-employed and the sustained self-employed, thus differentiating between intermittent and persistent workers in self-employment, and completing our division criteria.

The aim behind establishing our initial division criteria is to ensure that our dabblers and sustainers belong to two subgroups of self-employed, who are mutually exclusive from wage earners and are not interrelated, to make a valid inference over the variations observed in their characteristics within the self-employed and between the paid employees. The sample size consists of 1,146 sustainers (9.83 percent), 1,149 dabblers (9.85 percent) and 9,362 paid employees (80.32 percent). We compare our workers' characteristics with respondents in our sample that identify themselves as self-employed and paid employees, without digging further into their heterogeneity, nor imposing any restrictions (respondents are not required to be seen more than 8 waves in the sample, nor to have less than 2 spells of inactivity or/and unemployment) and separation criteria (employees are not required to be seen 100 percent of their total employment time only in paid employment, this applies also for the self-employed). Hence, we identify them as the amalgamated/ combined and general group of self-employed and paid workers in our study based on respondents' own declaration of current employment status (employee or self-employed) during interview time. Thus, the sample size is larger

compared to our division and consists of 2,601 self-employed workers and 15,285 paid employees.

Figure 3.3: Kernel Density and Histogram Diagram of Self-employed proportions



Source: BHPS & UKHLS

Additionally, we re-categorise our subgroups of self-employed workers using different proportions criteria, 0.60 (we label this as division 2 in our study) and 0.50 (we label this as division 3) and compare the results with our initial criteria 0.55 (division 1). In the third modification, we use the same initial 0.55 proportion criteria, but differentiate sustainers from workers who we see during their total employment time only in self-employment. Hence, sustainers are observed 55 percent and more of their total employment time in self-employment but less than 100 percent. We label workers who we observe only in self-employment during their total employment time as the always self-employed, like the always employees, and we compare the results between the four groups of workers (we label this as division 4). The fourth and last adjustment is we use the same division criteria, 0.55 proportion but without imposing any restriction on unemployment and inactivity (we label this as division 5). The aim behind all these alterations is to validate our initial division approach and to do some robustness check for the analysis. Hence, table 3.3 below summarises all the divisions used in this chapter.

Table 3.3: *Division Criteria in Self-employment*

Employment Categories Classification	Proportions	Division1 (Initial Division)	Division 2	Division3	Division4	Division5 No Restriction
	propotion (self-employed or employee) / total number of waves seen in employment (paid employment or self-employmet)	N>=8 waves; Total Unemployment and inactivity <=2 waves; at 55%. sustained self-employed proportion >=0.55, dabbled self-employed proportion <0.55 but >0 and always employees proportion=1	N>=8 waves; Total Unemployment and inactivity <=2 waves; at 60%. sustained self-employed proportion >=0.60, dabbled self-employed proportion <0.60 but >0 and always employees proportion=1	N>=8 waves; Total Unemployment and inactivity <=2 waves; at 50%. sustained self-employed proportion >=0.50, dabbled self-employed proportion <0.50 but >0 and always employees proportion=1	N>=8 waves; Total Unemployment and inactivity <=2 waves; at 55%. sustained self-employed proportion >=0.55 but <1, dabbled self-employed proportion <0.55 but >0, always employees proportion=1, and always self-employed proportion=1	N>=8 waves, at 55%. sustained self-employed proportion >=0.55, dabbled self-employed proportion <0.55 but >0 and always employees proportion=1
Sustained Self-employed	>=	1,146 individuals (9.83%)	1,111 individuals (9.53%)	1,303 individuals (11.17%)	524 individuals (4.49%)	1,570 individuals (9.96%)
Dabbled Self-employed	< & >0	1,149 individuals (9.85%)	1,184 individuals (10.15%)	992 individuals (8.51%)	1,149 individuals (9.85%)	1,684 individuals (10.68%)
Paid employees	always=1	9,362 individuals (80.32%)	9,362 individuals (80.32%)	9,362 individuals (80.32%)	9,362 individuals (80.32%)	12,916 individuals (79.36%)
Always Self-employed	always=1				622 individuals (5.34%)	
Total		11,657 individuals	11,657 individuals	11,657 individuals	11,657 individuals	15,757 individuals

Source: BHPS & UKHLS

3.3.3 Variables

The independent explanatory variables used in the analysis are the observed socio-economic and demographic characteristics of our respondents in the sample. They are classified in the following matter:

Individual demographic characteristics: gender, ethnicity, country of origin (UK or non-UK), mother tongue language (English or non-English), age (divided into age categories), health status (good, fair or poor), disability (if respondent considers him/herself as disabled), highest educational qualifications (higher degree, A-levels, GCSEs, other qualifications and none) and vocational qualifications.

Work nature: industry levels (high skilled, medium skilled and low skilled), if self-employed employing staff members, nature of self-employment (own business, partner in a business, work for self-employed, both own and work, subcontractor, freelancer or other), has second paid job and work satisfaction (dissatisfied, neither and satisfied).

Household characteristics: marital status (married or cohabiting, and not married/cohabiting), spouse/partner's employment status (spouse/partner employed and not employed), children (have kids, if responsible for dependent children under the age of 16, and care for other household members) and housing tenure (own house outright, own with mortgage, or rent).

Parental Background (mother and father's previous employment history (employed or self-employed) and educational qualifications (university degree, further education, school qualifications and none).

We dismiss the role of psychological factors and personality traits (like assertiveness, diversification, need for achievement, high internal locus of control, own for autonomy and discretion in work) because they are not available in our dataset and are not perceived as efficient nor necessary conditions to distinguish between entrepreneurs and employees (Parker,

2004). Thus, we restrain from looking at the psychological factors and only focus on the observed socio-economic and demographic characteristics of our workers in the sample.

3.3.3.1 Summary Statistics

Tables 3.4.A, 3.4.B, 3.4.C and 3.4.D reports the descriptive statistics for our amalgamated/combined/general group of self-employed and paid workers, and tables 3.5.A, 3.5.B, 3.5.C and 3.5.D for our main division (division 1); the sustained self-employed, dabbled self-employed and the always employees. In all tables, we include the p-values of the Pearson chi-squared test to show the differences between groups with respect to each independent variable. The descriptive statistics for our alternative divisions (division 2, 3, 4 and 5) are also found in Appendix A (tables 1, 2, 3 and 4, respectively) of this thesis.

3.3.3.1.1 Individual Characteristics

3.3.3.1.1.1 Gender

Previous studies showed that women have lower propensity to enter self-employment than men (Blanchflower, 2000; Leoni and Falk, 2010; Verhuel *et al.*, 2012; Keollinger *et al.*, 2013). They choose self-employment for push factors, internal reasons, personal conditions, because of family commitments, necessity and discrimination (Buttner and Moore, 1997; Boyd, 2000; Rosti and Chelli, 2005; Hughes, 2006; Dawdon *et al.*, 2009; Kelley *et al.*, 2011; Dawson and Henley, 2012; Williams, 2012). However, the nature of the working conditions in self-employment allows females to have personal autonomy, balance between work and family activities and benefit from flexibility of working hours to manage between both commitments (Buttner and Moore, 1997; Devine, 2001; Lombard, 2001; Orhan and Scott, 2001; Hughes, 2003, 2006; Dawson *et al.*, 2009). These conditions are crucial for mothers wanting to start their own businesses and become "mumtrepreneurs" (Hatfield, 2015 p:18). There is support that female self-employment rates have been rising over time, with their self-employment activities following a different contouring than those carried out by men (Devine, 1994;

Georgellis and Wall, 2005; Koellinger *et al.*, 2013), where women and men engage predominantly in different sectors.

Evidence from the UK and US showed that men are more market led and financially oriented than women when deciding to become self-employed, nevertheless the benefit of becoming one's own boss and work satisfaction play an important motivator factor in choosing this type of job (Cromie, 1987; Dennis, 1996; Taylor, 1996; DeMartino and Barbato, 2003; Smeaton, 2003; Frey and Benz, 2004; Kirkwood, 2009; Dawson *et al.*, 2009).

Also, there are dissimilarities in the formulation of intention between men and women towards entrepreneurial activities (Buttner and Moore, 1997; Hughes, 2006; Dawson *et al.*, 2009; Biehl *et al.*, 2014). Self-employment for men is more narrowed to pecuniary benefits, whereas for women it is more concerned with the quality of lifestyle offered with the flexibility aimed at a better work-life balance (Hakim, 1989a; Wellington, 2006; Dawson *et al.*, 2009).

Findings in the UK report that the gender effect is persistent in self-employment, and female business owners are lower in numbers, less than half, lagging behind male self-employment and in a less stable state compared to most OECD countries (Meager, 2007; D'Arcy and Gardiner, 2014; Hatfield, 2015). They represent the minority of the self-employed workforce in all developed countries and within ethnic minority groups (Fairlie and Meyer, 1996), whereas 90 percent of men are more likely to be self-employed than woman across Europe (Hatfield, 2015 p:16). Women are less likely to be found in industries that remain dominated by men and are more likely to be allocated in the service led sector (Parker, 2004). Oppositely, the female participation rates in paid employment have been rising, accounting for a 13 percent increase for women from 1971 to 2013 (ONS, 2013). Overall, the number of women entering the labour market and staying in employment and/or self-employment in the past few decades has increased more than men (ONS, 2018). This is the result of the rise in female educational attainments, outperforming men and contributing to greater employment

rates, better earnings and career progression (OECD, 2011). However, the gender wage gap is still substantial but showing signs of a moderate reduction (ILO, 2016).

Our results show that the self-employed in general have a higher male presence than female workers (75.91 percent of self-employed workers are men, compared to 24.14 percent are women in table 3.4A). Similarly, for both subgroups of self-employed; the sustained and the dabbled self-employed, the percentage of male workers is dominant (80.83 percent male compared to only 19.17 percent female workers identified as sustained self-employed, and 68.45 percent compared to 31.55 percent female workers are identified as dabbled self-employed in table 3.5A). Whereas, a higher proportion of female participation is recorded in wage employment, (51.40 percent are women in table 3.4A), and almost an equal proportion for the always employees (49.06 percent compared to 51.04 percent are women identified as always employees in table 3.5A), and the differences between all groups (self-employed versus employees, sustainers versus dabblers, sustainers versus always employees, and dabblers versus always employees) are all statistically significant with p-values less than 0.05 for the Pearson chi-squared test at the right-hand side of both tables 3.4 and 3.5. Thus, our findings confirm with the above studies, where the gender effect is still persistent in self-employment.

3.3.3.1.1.2 Ethnicity, Origin and Language

The association between ethnic minorities and self-employment has been highly researched in previous literature (e.g. Clark and Drinkwater (2000); Parker (2004)). The ethnicity variable helps capture the effect of workers' culture on the propensity to enter self-employment (Goetz and Rupasingha, 2013). Findings from the literature show that non-white workers are marginalised in the labour market and are more likely to lose their jobs and less likely to be employed (e.g. Taylor (1999); Fairlie (1999, 2004); Hout and Rose (2000); Martinez-Granado (2002); Fairlie and Robb (2007); Dawson *et al.* (2009)). Ethnic minority members are disadvantaged in the labour market because employers find difficulties in recognising their

skills, due to language barriers, ignorance of customs, culture and discrimination (e.g. Jones and Latreille (2011); Dawson *et al.* (2012)). Also, they are exposed to poor credit markets, higher borrowing rates and higher consumer discrimination (Borjas and Bronars, 1989; Clarck and Drinkwater, 2000; Blanchflower *et al.*, 2003; Simoes and Crespo, 2015). Similarly, immigrants who feel discriminated against are more likely to enter self-employment and tend to do better in self-employment than paid employment (Constant and Zimmermann, 2006; Lofstrom, 2002; Dawson *et al.*, 2009).

They start their own work in communities with similar ethnic backgrounds, because formal language skills are less needed, and form a high-density network with members of similar socioeconomic status and ethnic background (Portes and Sensebrenner, 1993), thus creating clustered geographic areas for ethnic enclaves (Boyd, 1991). This is in line with Light's (1972) cultural theory which identifies sociocultural background as a key variable to determine the propensity to become self-employed

Our results could not depict these issues, as we find that most our workers (more than 95 percent) are from a white ethnic background and this is demonstrated in both tables 3.4A and 3.5A. But the self-employed in general, and the dabbled and sustained self-employed report a higher percentage of workers from non-white ethnic backgrounds (2.92 percent in table 3.4A, 3.25 percent and 2.77 percent in table 3.5A, respectively) than the general group of employees and always employees (2.53 percent in table 3.4A and 2.09 percent in table 3.5A). The differences between our group of self-employed workers and wage earners are statistically significant; however, between the sustainers and dabblers we could not depict any significant difference for workers from non-white ethnic backgrounds (Pearson chi-squared test p-values equal to 0.9).

Similarly, most of our respondents are UK-born (more than 93 percent) and consider English to be their first language (more than 78 percent). The self-employed in general and

both subgroups of self-employed report a higher percentage of non-UK born workers (6.16 percent in table 3.4A, 6.18 percent of sustainers and 5.51 percent of dabblers in table 3.5A), than the paid workers (4.69 percent are non-UK born) and the always employees (4.27 percent are non-UK born), and the differences between groups (except between sustainers and dabblers) are significant (Pearson chi-squared test p-values less than 0.05 between the amalgamated group of self-employed and paid employees in table 3.4A and between sustainers and always employees, and dabblers and always employees in table 3.5A).

Only the general group of self-employed and sustained self-employed report higher percentages for non-English language than paid workers (3.90 percent for the general self-employed, and 5 percent for the sustained self-employed), and the differences between groups are statistically significant. Whereas, the dabbled self-employed have similar percentages to the general employees and the always employees. So far, the statistics reveal that the minority groups are less advantaged in the labour market and are less likely to be found in paid employment than self-employment. Still, an ethnic penalty is present in all our groups of workers in the dataset, like the findings of Bell and Casebourne (2008).

3.3.3.1.1.3 Age

The existing relationship between age and self-employment are mixed (Rees and Shah, 1986). The academic literature highlighted several arguments supporting two main associations; a positive influence of age and a reverse impact above a certain threshold. Combining both aspects, the results show an inverse U-shaped relationship between age and self-employment, which is consistent with the model of Levesque and Minniti (2006) (Simoes and Crespo, 2015).

The relationship is said to be convex when self-employment increases with age at an growing rate (Brock and Evans, 1986; Borjas, 1987), where the self-employed learn more about their abilities over time (Jovanovic, 1979, 1982; Shwartz and Griffin, 1986; Martinez-Granado, 2002; Cowling and Taylor, 2001; Taylor, 2004; Meager, 2007; Dawson *et al.*, 2009).

On the other hand, the relationship is said to be curvilinear when inflow into self-employment rises with age but up to a certain limit due to the retirement effect (Meager, 2007). Evans and Leighton's (1989) findings showed that the probability of entering self-employment increases by age, but when workers reach the age of 40 and/or hit retirement age, this relationship stabilises.

Self-employment is highly predominant among older groups of people, mostly individuals beyond the age of 65 (Duchesne, 2004), because of the shift from paid employment to self-employment, the retirement from paid employment to self-employment, and due to both effects (Quinn, 1980; Fuchs, 1982; Lazear, 1986; Zissimopoulos and Karoly, 2007). Also, age is positively correlated with a stronger desire for flexible employment status.

Hatfield (2015), using the Eurostat Labour market database for the year 2013, demonstrated that the number of self-employed is higher among older groups of workers in the UK, especially between the ages of 50 and 65, as they tend to have higher level of human capital as well as physical capital and better access to financial credit that helps the start-up of a business. For this reason, the self-employed are expected to be older and more experienced workers, as the human and physical capital requirements for entrepreneurs are often unavailable for young workers (Parker, 2004 p:70; D'Arcy and Gardiner, 2014). Thus, the proportion of young workers who own their private business is very low in the UK, only young individuals with inheritance or gifts as form of capital/assets are more likely to enter self-employment (e.g. Holtz-Eakin *et al.* (1994) for US sample; Blanchflower and Oswald (1998) for UK evidence).

Offsetting factors are that older worker are more risk averse and are less able to work longer hours as required in self-employment (Hintermaier and Steinberger, 2005). Most recent evidence from Britain showed that usually the self-employed tend to be older than employees (D'Arcy and Gardiner, 2014; ONS, 2014). But previous findings also confirmed that younger

people would engage in riskier jobs like self-employment because they are less risk averse (Johnson, 1978; Jovanovic, 1979; Miller, 1984). It was found that risk averseness is positively related with age, where the reported interest in self-employment decreases with age (Morin and Suarez, 1983; Rees and Shah, 1986; Bakshi and Chen, 1994; Palsson, 1996; Blanchflower *et al.,* 2001). Other descriptive studies showed that self-employment is concentrated among individuals in their mid-career between 35 and 40 years of age, where the probability of transition to self-employment usually peaks between the ages of 35 and 44 (Cowling, 2000; Reynold *et al.*, 2002; Parker, 2009) and for some at later age of 48 (Georgellis *et al.*, 2005).

In our study, the age group variable is divided into five age subcategories, with respondents' ages ranging from 16 to 24, 25 to 39, 40 to 49, 50 to 64 and 65 and over. The intuition behind dividing the age band is to observe the percentage of workers allocated between young, middle aged and oldest groups in the labour market. It is noticeable that the youngest category of workers (age 16 to 24) are lastly allocated among the self-employed (2.76 percent) and the sustained self-employed (2.94 percent), compared to our group of paid workers (9.98 percent for the general group of paid workers and 10.76 percent for the always employees) and the differences are statistically significant between groups (Pearson chi-squared test p-values are less than 0.05). This is conceivable as they necessarily have fewer observations and thus less scope for being observed in self-employment. Whereas, the first cohort of the middle-aged subcategory (age 25 to 39) are the highest among the general employees (40.58 percent) and the dabbled self-employed (47.94 percent), and the differences among groups are statistically significant. The second cohort (age 40 to 49) are the highest among the general self-employed (29.92 percent), and the always employees (45.09 percent). The older subgroup of workers (age between 50 and 64) are the highest among the general group of self-employed (31.51 percent), the always employees (28.34 percent), followed by the sustained self-employed (27.30 percent), and lastly by the dabbled self-employed (13.68

percent). For respondents aged 65 and over they are higher in general self-employment than paid employment (3.67 percent compared to 1.31 percent in Table 3.4A). Oppositely, we find that the highest percentage for workers age 65 and over are the always employees (15.24 percent), and the lowest for the dabbled self-employed (0.38 percent), but the differences among these last two are insignificant (Pearson chi-squared p-values equal to 0.467). Also, very few of our sustainers (2.41 percent) are aged 65 and over. The higher percentage in paid employment for the elderly group of workers can be explained by the phasing out of the retirement age of 65 and the enforcement of the Equality Act for ageism in 2010. The BHPS dataset for the years 1991 till 2008 could not depict that influence; however, its successor the UKHLS for the years 2010 to 2014 outweighs this drawback (gov.uk, 2014; McFall, 2013; D'Arcy and Gardiner, 2014).

What has been shown here is that the general group of self-employed workers are older than the employees in our sample, conforming also with British statistics (D'Arcy and Gardiner, 2014; ONS, 2014), because business start-ups demand more physical and human capital accumulation from individuals, transmitted by the knowledge and abilities gained over time through life and work experience (Taylor, 2004; Meager, 2007; Dawson *et al*., 2009). But, when comparing the findings with our division of workers, the results do not match, where the always employees are shown to be older than both subgroups of self-employed, and the dabbled self-employed are the youngest among our division. This is because the always employees are the categorised group of paid workers who we observe more than one-third of the time in paid employment only, hence they are lower in numbers and older than the general/amalgamated group of employees that do not follow this set of criteria. Whereas, for dabblers, we do not see them fully committing to either paid or self-employment jobs.

3.3.3.1.1.4 Health Status and Disability

Health status and disabilities greatly influence mobility and ability to work. Studies show that workers with poor health conditions and disabilities are more likely to become self-employed (Fairlee and Meyer, 1996; Borjas, 1986; Zissimopoulos and Karoly, 2007; Jones and Latreille, 2011). Self-employment may offer a route out of employer discrimination against the disabled (Parker, 2004 p:75; Pagan, 2009; Jones and Latreille, 2011). But some jobs with high self-employment concentration are less suited and more dangerous for disabled workers (like the construction sector), because the self-employed are more likely to work longer hours and are exposed to a higher level of stress. Some found considerable negative association between poor health and self-employment (Taylor, 2001; Cahill *et al.*, 2013). Others suggest that self-employed males report better health conditions than paid employees, whereas female business owners are less healthy in the UK (Curran and Burros, 1989). The evidence between ill health and self-employment are mixed; negative effects were cited by Rees and Shah (1986), and positive effects by Cowling and Taylor (2001) for the case of the UK. These mixed results are anticipated given the heterogeneity of the dataset, the proxy measures used, and the variety of methodological approach adapted in these studies (Simoes and Crespo, 2015).

Our results show, that respondents reporting good health conditions are the highest among the general group of self-employed (79.21 percent in table 3.4A) and for both subgroups of self-employed (80.64 percent of sustainers and 79.98 percent of dabblers in table 3.5A) in comparison to paid employees (76.88 percent) and the always employees (78.78 percent). However, the differences between the amalgamated group of self-employed and paid workers are insignificant, whereas among our division of workers the Pearson chi-squared p-values are highly significant. This is also confirmed by the lower prevalence of workers who consider themselves as disabled in general self-employment (3.90 percent) and in both a sustained (3.16 percent) and dabbling manner (3.93 percent), compared with general paid employment (4.75

percent) and always in wage employment (4.44 percent), all yielding significant values for the differences.

3.3.3.1.1.5 Educational and Vocational Qualifications

Education, either formal (educational) or informal (vocational) is an important determinant for self-employment entry. Education helps self-employed workers to be well informed and more efficient in spotting business opportunities, improving the quality of business discovered and provided, and increasing firms' efficiency and growth (Congregado *et al.*, 2005; Loftstorm and Wang, 2006; Thurik *et al.*, 2008).

Findings on education are far from conclusive; some are associated with positive influence on self-employment entry and survival rate, longevity and increase in stability (e.g. Meager and Bates (2004); Kim *et al.* (2006); Meager (2007); Saridakis *et al.* (2008); Block and Sandner, (2009); Georgarakos and Tasiramos (2009); Haapanen and Tervo (2009); Rosti and Chelli (2009); Baptista *et al.* (2010); Wilkins (2014)). Others show negative associations between education and self-employment, as can be found in the literature (Nafziger and Terell, 1996; Bruce, 1999; Clarck and Drinkwater, 2000; Blanchflower, 2001; Lee, 2001, Blanchflower, 2004 (for the case of Europe only)). Also, some find the effect to be insignificant and irrelevant (e.g. Evans and Leighton (1989); Taylor (1999); Carrasco (1999); Johansson (2001); Dahl and Reichstein (2007); Gerogellis *et al.* (2007); Brown *et al.* (2007); Van der Sluis *et al.* (2008)).

Posche (2013) consolidated a U-shaped relationship between education and self-employment (Blanchflower, 2000; Astebro *et al.*, 2011). There are positive and negative relationships between self-employment and education. On one hand individuals who are more educated might self-select into occupations that are more common in self-employment, like managerial jobs and skilled manual work (Form, 1985; Evans and Leighton, 1989b). Thus, we observe growing opportunities for the self-employed in the knowledge industry (Keeble *et al.*,

1993), as the greater levels of education make individuals more opportunity driven and increase the number of entrepreneurs by keeping them informed on missing business prospects (Joona and Wadensjo, 2013). But the skills that make a good entrepreneur are not likely to be seen embodied only in formal education (Casson, 2003). There are still unobserved factors that influence a person to become self-employed and the impact of education can be masked when differences across industries and fields of study are not considered (Bates, 1995; Falk and Leoni, 2009).

The qualification levels shed light on the characteristics of people who enter self-employment. On the one hand, entrepreneurs are expected to be highly skilled workers who offer new and creative services to the market. From another perspective, there is evidence suggesting that workers with labour market disadvantaged characteristics are more likely to become self-employed, because it represents an easier route to employment (Hatfield, 2015). Statistics from the Eurostat Labour Market Database (2014a) showed that the self-employed in the UK are more likely to have low-level qualifications (less than primary or lower level of secondary education), and only 38 percent had higher qualifications in 2013 (Hatfield, 2015 p21).

But there are critical methodological problems that can cause the differences in the empirical results. The heterogeneity across measurements of educational attainment levels is a concerning matter, the endogeneity problem of education, and the self-selection process into self-employment is a serious problem, where education appears to be a determinant factor in self-employment entry and at the same time is correlated with the error term of the model (Simoes and Crespo, 2015). This correlation is caused by some measurement problems and the omission of important variables that are hard to distinguish (like abilities and other unobserved characteristics) (Block *et al*., 2013).

The education level here is set across five levels of attainments; higher degree, A-levels, GCSE, other qualifications and no qualification. Also, an additional dummy variable is included to indicate if workers have any vocational qualifications. In general, the paid workers have a significantly higher percentage for degree achievement compared to the general group of self-employed workers (45.26 percent for higher degree compared with 43.09 percent of self-employed workers with higher degree, in table 3.4A), where the latter report higher percentages for not holding any qualifications (15.88 percent of self-employed workers report no qualifications compared to 13.38 percent for paid workers), with both differences highly significant at 99% confidence level for the Pearson chi-squared test in table 3.4A . Looking at our division, the percentages differ, where dabblers have the highest percentage of higher degree achievement (52.57 percent, compared to 42.61 percent for sustainers, and 45.97 percent for the always employees, in table 3.5A), and lowest in reporting not having any qualifications (9.16 percent, compared to 15.21 percent for sustainers and 11.06 percent for the always employees), with both differences highly significant at 99 percent confidence level. A-levels, other qualifications and no qualifications are significantly higher among the sustained self-employed and GCSEs levels among the always employees. As for having vocational qualifications (the skills acquired by the National Occupation Standard), the percentages are equally shared, among our three groups of workers (at 44 percent).

3.3.3.1.2 Work Characteristics

3.3.3.1.2.1 Industry level

Worker's occupation and industry concentration provides an indication of the skill levels each possess (highly skilled, medium skilled or low skilled). For this reason, we convert the industry variable, based on the 2010 Standard Industry Classifications into skills levels (available in table 3.4B for the general group of self-employed and 3.5B for our division of workers). The highly skilled workers consist of managers, senior officials, professional occupations, associate

professionals and technical. The medium skilled are the administration and secretarial work, skilled trades, care, leisure and other services, and the low skilled are workers in sales and customer services, in process, plant and machine operatives, and in elementary occupations.

Studies show that sectors have certain job specifications that are highly associated with self-employment, like the high self-employment rates in the construction industry (e.g. Nisbet and Tomas (2000), Meager (2007), D'Arcy and Gardiner (2014) and Hatfield (2015) for evidence on the UK; Goetz and Rupasingha (2013) for evidence on the US), in law and accountancy (Dawson *et al.*, 2009) and most recently in the knowledge intense sector (D'Arcy and Gardiner, 2014). According to Eurostat (2014a) statistics in 2013, the largest occupational group in the UK is professional (24 percent), followed by craft and related products (22 percent). Most UK self-employed are in highly skilled occupations (46 percent) (Hatfield, 2015 p:24). The rise in self-employment in the last 5 years has been observed in higher skilled managerial professional and associate professional jobs (Deane, 2016).

The results in table 3.4B confirm the findings mentioned above and show that our general group of self-employed have a significantly higher percentage in high skilled industry than employees (43.73 percent compared to 33.03 percent, with p-values equal to null for the Pearson chi-squared test), where these latter have significantly higher percentage in medium (36.01 percent of paid employees versus 33.01 percent of self-employed workers in medium skilled industry) and low skilled work (22.73 percent of paid employees versus 14.86 percent of self-employed workers in low skilled industry). Similarly, in table 3.5B the percentages in highly skilled jobs are significantly higher for both subgroups of self-employed than the always employees, with dabblers having the highest percentages in highly skilled occupation (44.30 percent for dabblers, compared to 42.51 percent for sustainers and 32.99 percent for always employees). Whereas, the always employees predominate the medium (36.49 percent) and low skilled (21.40 percent) industries.

3.3.3.1.2.2 Employ Staff

Looking at the general group of self-employed in our data, only 30.55 percent employ staff to work for them in table 3.4B. Hence this is also evident for our sustainers with 30.45 percent of them employing staff, whereas for our dabblers, only 4 percent are self-employed with employees. We further look at the nature of work in self-employment and find that the highest percentage of self-employed in our study report that they work for self-employed members (40.72 percent), or own business (33.07 percent) and just a very few own and work at the same time (1.89 percent). This is also evident for both subgroups of self-employed and the differences for the Pearson chi-squared test are all significant; however, we do not rely much on this variable as the percentage of missing responses are very high.

3.3.3.1.2.3 Second Jobs and Work satisfaction

The last few years showed a growth in the number of workers who combine both self-employment and paid employment, which are defined as the "doubling up" and hybrid form of workers, that are now present as a response to the tough economic conditions within a country (D'Arcy and Gardiner, 2014, p:19; Solesvik, 2017).

In our sample, the percentage of workers with second paid jobs is significantly higher among the general group of paid workers than with the self-employed (22.79 percent compared to 9.58 percent, with p-values equal to null in table 3.4B). But the results do not match with the summary statistics found in table 3.5B for our division of workers. The always employees report the lowest percentages in having second paid jobs (7.90 percent), whereas dabblers have the highest percentages (12.91 percent).

Looking at work satisfaction, the self-employed in general report higher work satisfaction than paid workers (87.18 percent compared to 81.99 percent in table 3.4B). This is also evident for our sustainers (87.65 percent in table 3.5B), whereas dabblers and always employees report the same levels of satisfaction (82 percent).

3.3.3.1.3. Household Characteristics

3.3.3.1.3.1 Marriage, spouse employment, children, dependence and care

The housing structure plays an important role in determining how self-employment is viewed. Where marital status influences the labour market outcomes for self-employment (Parker, 2009; Simoes and Crespo, 2015), the presence of a spouse/partner offers a safety net for the self-employed, and reassurance by securing a monthly fixed income for households and providing start-up capital (Scace and Goffee, 1982; Borja, 1986; Parker, 2004; Budig, 2006; Dawson *et al.*, 2012). Also, a spouse/partner can provide emotional support and help out with the work to pursue the best interests of the business (Borja, 1986; Bosma *et al.*, 2004; Brown *et al.* (2011). This aligns with the risk diversification explanation, where the self-employed usually face higher levels of financial uncertainty and couples may wish to diversify their risk through the combination of different types of employment (Parker, 2008). But evidence on having a working spouse has been mixed, reporting positive impact by Laferrere and McEnte (1995) and a negative one by Fujii and Hawley (1991).

Self-employment can be also viewed as a means to balance between working hours and family duties, especially for women responsible for children and taking care of other household members (Hundley, 2001; Lombard, 2001; Taniguchi, 2002; Hughes, 2003; Wellington, 2006). The flexibility of the working hours allows balancing work with family responsibility, leading to an enhanced psychological wellbeing (Cromie, 1987; Loscocco, 1997). However, some report higher work-family conflicts for the self-employed due to the long working hours and stress exposure, thus lowering the levels of family satisfaction when compared to employees (Parasuraman and Simmers, 2001).

At the same time, self-employment might be considered as riskier job option than paid employment, with no fixed monthly pay to cover up the daily costs associated with family responsibilities and commitments when having a child (Dawson *et al.*, 2009). The presence of

children is considered to provide a better understanding on how the family composition affects the entry into self-employment (Simoes and Crespo, 2015). Couples with children are more risk averse, because child-raising is difficult to reconcile and is more demanding in self-employment than in paid employment (Fairchild, 2009). But the empirical studies (e.g. for UK evidence, Taylor (1996); Clark and Drinkwater (1998), Knight and Mckay (2000); Wellington (2006); Brown *et al.* (2011)), mostly report the self-employed to be married and to have dependent children.

Our findings, do not totally align with the studies mentioned above. Marriage or cohabiting is significantly more prevalent for the self-employed (82.29 percent) in table 3.4C and for our group of sustainers (81.45 percent) and dabblers (79.54 percent) in table 3.5C (with p-values equal to null for the Pearson chi-squared test in both tables). But the employees report a significantly higher percentage for working spouses or partners (62.99 percent compared to 61.30 percent for self-employed workers with working spouses or partners), whereas in our division the dabblers have the highest percentage (65.82 percent), followed by the always employees (64.79 percent) and lastly by the sustainers (61.85 percent). The self-employed in general and the sustained and dabbled self-employed report a significantly higher percentage in having children, however the general paid workers and always employees report a significantly higher percentage in having dependent children under the age of 16 and taking care of other household members.

3.3.3.1.3.2 House Tenure

The housing tenure is very informative on the owner's physical capital and wealth. Wealth makes the risk associated with uncertain profits from self-employment less important, and thus makes self-employment more attractive than paid employment, by removing the bindings from liquidity constraints (Evans and Jovanic, 1989; Van Geldern, 2004; and Pleijster and Van der Valk, 2007). This is previously documented by the study of Evans and Leighton (1989),

Blanchflower and Oswald (1998), Dunn and Holtz-Eakin (2000), Henley (2004), and Dawson *et al.* (2009); all showing a positive effect on housing wealth and the likelihood of being self-employed.

Our findings conform with the literature above, whereby house ownership outright is the highest among the self-employed in general (24.83 percent), and for the sustained self-employed (23.04 percent), with all differences between groups significant at 99% confidence level for the Pearson chi-squared test, hence suggesting that these latter are better off than wage earners and dabblers with respect to home ownership. Whereas ownership with mortgage and renting is significantly higher among the paid workers (65.86 percent and 19.47 percent, respectively), reflecting stricter financial commitments than the self-employed. This is also evident for the dabbled self-employed with owning with mortgages (74.90 percent) and the always employees with renting properties (18.48 percent), with all differences significant for the Pearson chi-squared test.

3.3.3.1.4 Parental Background

3.3.3.1.4.1 Fathers and Mothers Self-employed

The influence of intergenerational mobility, through parents' social status and employment increases the success in the transition of children into entrepreneurial activities, especially for self-employed parents and manager fathers (e.g. Fairlie (1999); Dunn and Holtz-Eakin (2000); Hout and Rosen (2000); Taylor (2001); Martinez-Granado (2002); Fairlie and Robb (2003); Henley (2004); Parker (2004); Meager (2007); Anderson and Hammarstedt (2010a)). This suggests that having a parent with prior self-employment experience increases children's decisions to follow the same path (Le, 1999; Hundley, 2006; Barnir and McLaughlin, 2011; Eren and Sula, 2012). The impact of parents highly relates to the transfer of the general human capital (the knowledge, the values, the attitudes and the managerial skills (e.g. Hundley (2006); Barnir and Maclaughlin (2011)), the specific human capital (knowledge about parental

businesses and contacts in Kim *et al.* (2006) and White *et al.* (2007)), the financial conditions (wealth and income in Hundley's (2006) study), the inheritance of parental business and the exposure to parental role models and realistic job preview of self-employment (e.g. Bandura (1986); and Chlosta *et al.* (2012)). These factors strongly affect the transition of offspring into parents' ventures (e.g. Lentz and Laband (1990) for the case of the US; Dun and Holtz-Eakin (2000); Meager (2007)). For that reason, self-employment tends to run in the family. Self-employed parents offer informal induction to business methods, transfer business experience, provide access to capital equipment, business network consultancy and reputation to their children (Parker, 2004 p:85). The effect is stronger for fathers previously self-employed on the probability for sons to become self-employed, more than mothers. Whereas, previously self-employed mothers are more important for daughters, and having both parents as self-employed has the greatest effect (Dunn and HoltzEakin, 2000).

Looking at parents' background information in table 3.4D, our findings conform with the literature, where the self-employed in general report significant higher percentages than paid workers of having previously working fathers and mothers as self-employed (24.77 percent of self-employed fathers and 7.25 percent of self-employed mothers for the self-employed, compared to 13.48 percent of self-employed fathers and 3.83 percent of self-employed mothers for paid workers, with Pearson chi-squared values less than 0.05). This is also evident for our group of sustainers in table 3.5D (26.68 percent of self-employed fathers and 7.28 percent of self-employed mothers). But the percentages gradually decrease for the dabbled self-employed (18.20 percent of self-employed fathers and 6.55 percent of self-employed mothers) and are significantly the lowest for the always employees (13.33 percent of self-employed fathers and 3.56 percent of self-employed mothers, with p-values for the Pearson chi-squared test equal to null).

3.3.3.1.4.2 Fathers' and Mothers' Educational Qualifications

Finally, looking at parents' previous educational background, the self-employed have significantly higher percentages for fathers and mothers with university degrees. This is also the case for sustained self-employed fathers and dabbled self-employed mothers. However, both variables on parental educational status suffer from high percentages in missing responses; for this reason we restrain from using these two variables.

3.3.3.1.5 Results with Divisions 2, 3, 4 and 5

The results found also conform with the alternative division criteria created, divisions 2, 3, 4 and 5, and are found in appendix A, in tables 1, 2, 3, 4, respectively. In addition, the results show for division 4 in tables 3A, 3B, 3C and 3D that the sustained self-employed are similar to the always self-employed with respect to their socio-economic characteristics. And for the case of the main division criteria, without any restrictions on the number of times seen in unemployment and inactivity (division 5) in tables 4A, 4B, 4C and 4D in appendix A, the findings are similar to our initial division. However, the results show that the dabbled self-employed have significantly higher percentages in inactivity and unemployment than sustained self-employed and the always employees.

3.3.3.2 Correlation and Significance

The Variance Inflation Factors (VIF) method is used to measure the increased variances of the independent parameters caused by the complex design of weighted, clustered and stratified survey estimates (Liao and Valliant, 2012). Although the problem of multicollinearity cannot be clearly defined, it is clear that the lower the correlation between the independent variables the better the model (Wooldridge, 2013). The VIF for the slope coefficient of each independent predictor quantifies how much variance is inflated, caused by the correlation with other explanatory regressors. Statistically, correlation among the predictors can lead to slope estimates with very large variances, opposite to what is expected (Neter *et al*., 1996), imprecise

estimates (Kmenta, 1986), forecasting figures and wrong estimation (Farrar and Glauber, 1967). A value of VIF exceeding 10 is a sign of serious multicollinearity requiring correction by removing the violating predictors from the model.

The VIF values for the explanatory variable shown in the summary statistics tables do not show any concern of larger inflated variances between coefficients. They are lower than 6 and on average less than 2, except for the variables explaining the nature of self-employment and indicating if the self-employed employ workers. For this reason, we decided to exclude these two variables from the analysis and are unable to check the nature of work in self-employment and if the self-employed employ workers or not. The Pearson $\chi 2$–test statistics have significant association between all categorical variables used and the dependent outcome. This provides further validation on the use of these particular variable in our analysis.

Table 3.4A: *Descriptive Statistics (Employee and Self-employed Individual Characteristics)*

Variables	Employees (15,285 respondents) Percentages	Self-employed (2,601 respondents) Percentages	VIF	Pearson χ^2 test self-employed vs employees p-val.
Individual Characteristics				
Gender			1.60	
Male	48.60%	75.91%		0.000
Female	51.40%	24.14%		0.000
missing	0.00%	0.00%		
Ethnicity			5.09	
White	97.31%	97.03%		0.000
Non-White	2.53%	2.92%		0.000
missing	0.16%	0.05%		0.220
Country of Origin			4.97	
UK	95.31%	93.84%		0.000
Non-UK	4.69%	6.16%		0.000
missing	0.00%	0.00%		
Language			1.36	
English	84.72%	83.08%		0.000
Non-English	2.30%	3.91%		0.000
missing	12.98%	13.01%		0.001
Age			1.34	
16-24	9.98%	2.76%		0.000
25-39	40.58%	32.14%		0.000
40-49	26.63%	29.92%		0.000
50-64	21.50%	31.51%		0.000
65+	1.31%	3.67%		0.000
missing	0.00%	0.00%		
Health status			1.16	
Good	76.88%	79.24%		0.232
Fair	17.94%	16.65%		0.058
Poor	4.96%	3.99%		0.003
missing	0.22%	0.12%		0.000
Disable			1.03	
Yes	4.75%	3.90%		0.000
No	95.34%	96.09%		0.000
missing	0.01%	0.01%		0.047
Educational Qualifications			4.25	
Higher degree	45.26%	43.09%		0.000
A-levels	12.09%	12.28%		0.952
GCSEs	20.37%	19.61%		0.088
Other qualifications	8.04%	8.82%		0.072
None	13.38%	15.88%		0.000
missing	0.86%	0.31%		0.000
Vocational Qualifications			1.62	
Yes	42.21%	43.24%		0.004
No	56.44%	56.10%		0.000
missing	1.35%	0.67%		0.000

Source: BHPS & UKHLS

Table 3.4B: *Descriptive Statistics (Employee and Self-employed Work Nature)*

Variables	Employees (15,285 respondents) Percentages	Self-employed (2,601 respondents) Percentages	VIF	Pearson χ^2 test self-employed vs employees p-val.
Work Nature				
Industry Levels			1.10	
High skilled	33.03%	43.73%		0.000
Medium skilled	36.81%	33.01%		0.000
Low skilled	22.73%	14.86%		0.000
missing	7.43%	8.40%		0.000
Employ staff			23.82	
Yes	0.00%	30.55%		0.000
No	0.00%	69.16%		0.000
missing	100.00%	0.29%		0.000
nature of self-employment			23.61	
Own business	0.00%	33.07%		0.000
Partner in a business	0.00%	11.65%		0.000
Work for self-employed	0.00%	40.72%		0.000
Both own and work	0.00%	1.89%		0.000
Subcontractor	0.00%	6.15%		0.000
Freelancer	0.00%	4.43%		0.000
Other	0.00%	2.04%		0.000
missing	100.00%	0.05%		0.000
Second paid job			6.35	
Yes	27.79%	9.58%		0.000
No	72.14%	90.33%		0.000
missing	0.07%	0.09%		0.000
Work statisfaction			2.15	
dissatisifed	10.52%	6.68%		0.000
neither	7.49%	5.92%		0.000
satisfied	81.99%	87.18%		0.447
missing	0.09%	0.22%		0.000
Total waves in unemployment and/or inactivity			1.17	
0	49.12%	57.85%		0.000
1	14.27%	11.67%		0.000
2	7.98%	6.72%		0.000
3-8	19.27%	14.49%		0.000
8+	9.36%	9.26%		0.197

Source: BHPS & UKHLS

Table 3.4C: *Descriptive Statistics (Employee and Self-employed Household Characteristics)*

Variables	Employees (15,285 respondents)	Self-employed (2,601 respondents)	VIF	Pearson χ^2 test
	Percentages	Percentages		self-employed vs employees p-val.
Household Characteristics				
Married /Cohabitting			2.18	
Yes	74.77%	82.29%		0.000
No	25.19%	17.49%		0.000
missing	0.04%	0.22%		0.000
Spouse/Partner employed			1.76	
Yes	62.99%	61.30%		0.000
No	12.14%	21.27%		0.000
missing	24.93%	17.40%		0.000
Has Children			2.26	
Yes	38.90%	41.13%		0.000
No	61.14%	58.87%		0.000
missing	0.00%	0.00%		
Responsible for dependent child under age of 16			2.56	
Yes	20.70%	11.25%		0.366
No	79.33%	88.83%		0.000
missing	0.00%	0.00%		0.000
Care for other household members			1.76	
Yes	3.62%	3.56%		0.000
No	86.96%	86.46%		0.000
missing	9.43%	9.98%		0.146
Housing tenure			1.35	
Own house outright	14.74%	24.83%		0.000
Own house mortgage	65.48%	60.82%		0.000
Rent	19.47%	14.01%		0.000
missing	0.31%	0.34%		0.000

Source: BHPS & UKHLS

Table 3.4D: *Descriptive Statistics (Employee and Self-employed Parental Background)*

Variables	Employees (15,285 respondents) Percentages	Self-employed (2,601 respondents) Percentages	VIF	Pearson χ^2 test self-employed vs employees p-val.
Parents background				
Father employment history			1.38	
Employee	69.41%	61.82%		0.00
Self-employed	13.48%	24.77%		0.00
missing	17.11%	13.41%		0.00
Mother employment history			1.15	
Employee	47.57%	40.03%		0.00
Self-employed	3.83%	7.25%		0.00
missing	48.61%	52.82%		0.00
Father educational qualifications			3.96	
University degree	34.63%	36.50%		0.00
Further education	13.44%	14.07%		0.21
School qualifications	20.85%	18.92%		0.00
None	4.85%	5.85%		0.00
missing	26.23%	24.66%		0.00
Mother educational qualifications			4.01	
University degree	39.52%	40.57%		0.01
Further education	21.19%	20.78%		0.00
School qualifications	12.06%	12.31%		0.07
None	2.95%	2.91%		0.40
missing	24.28%	23.43%		0.42

Source: BHPS & UKHLS

Table 3.5A: *Descriptive Statistics (Division1 Individual Characteristics)*

	Sustained self-employed (1,146 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Variables							
Individual Characteristics							
Gender				1.04			
Male	80.83%	68.45%	51.04%		0.000	0.000	0.000
Female	19.17%	31.55%	49.06%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Ethnicity				1.12			
White	96.75%	97.23%	97.81%		0.000	0.000	0.461
Non-White	3.25%	2.77%	2.09%		0.900	0.000	0.000
missing	0.00%	0.01%	0.11%		0.000	0.000	0.000
Country of Origin				1.01			
UK	93.82%	94.49%	95.83%		0.281	0.000	0.000
Non-UK	6.18%	5.51%	4.27%		0.281	0.000	0.000
missing	0.00%	0.00%	0.00%				
Language				1.36			
English	78.78%	90.28%	79.86%		0.000	0.045	0.000
Non-English	5.00%	2.28%	2.13%		0.000	0.000	0.000
missing	16.22%	7.44%	18.01%		0.000	0.000	0.000
Age				1.34			
16-24	2.94%	8.17%	10.76%		0.000	0.000	0.000
25-39	35.35%	47.94%	10.76%		0.000	0.000	0.000
40-49	32.00%	29.82%	45.09%		0.365	0.000	0.000
50-64	27.30%	13.68%	28.34%		0.000	0.000	0.467
65+	2.41%	0.38%	15.24%		0.000	0.000	0.214
missing	0.00%	0.00%	0.57%				
Health status				1.16			
Good	80.64%	79.98%	78.78%		0.000	0.000	0.000
Fair	15.50%	16.43%	16.66%		0.000	0.002	0.000
Poor	3.79%	3.50%	4.46%		0.000	0.854	0.000
missing	0.07%	0.09%	0.10%		0.000	0.000	0.000
Disable				1.08			
Yes	3.16%	3.93%	4.44%		0.000	0.000	0.000
No	96.83%	96.17%	95.65%		0.000	0.000	0.000
missing	0.01%	0.00%	0.01%		0.000	0.000	0.001
Educational Qualifications				5.25			
Higher degree	42.61%	52.57%	45.97%		0.000	0.700	0.001
A-levels	13.28%	12.54%	12.82%		0.000	0.008	0.001
GCSEs	19.66%	17.55%	21.51%		0.000	0.387	0.001
Other qualifications	9.08%	7.57%	7.73%		0.000	0.000	0.001
None	15.21%	9.16%	11.06%		0.004	0.000	0.001
missing	0.16%	0.61%	0.91%		0.000	0.000	0.001
Vocational Qualifications				1.67			
Yes	44.07%	44.01%	44.28%		0.000	0.008	0.001
No	55.57%	55.36%	54.73%		0.000	0.000	0.001
missing	0.36%	0.63%	0.99%		0.000	0.000	0.001

Source: BHPS & UKHLS

Table 3.5B: *Descriptive Statistics (Division1 Work Nature)*

	Sustained self-employed (1,146 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Variables							
Work Nature							
Industry Levels				1.31			
High skilled	42.51%	44.30%	32.99%		0.000	0.000	0.001
Medium skilled	32.51%	32.67%	36.49%		0.000	0.339	0.001
Low skilled	15.37%	18.06%	21.40%		0.000	0.000	0.001
missing	9.62%	4.97%	9.12%		0.000	0.000	0.001
Employ staff				20.10			
Yes	30.45%	4.06%	0.00%		0.000	0.000	0.001
No	57.46%	11.43%	0.00%		0.000	0.000	0.001
missing	12.09%	84.51%	100.00%		0.000	0.000	0.001
nature of self-employment				20.01			
Own business	30.83%	4.24%	0.00%		0.000	0.000	0.001
Partner in a business	12.11%	1.74%	0.00%		0.000	0.000	0.001
Work for self-employed	33.20%	6.78%	0.00%		0.000	0.000	0.001
Both own and work	1.61%	0.29%	0.00%		0.000	0.000	0.001
Subcontractor	5.35%	1.31%	0.00%		0.000	0.000	0.001
Freelancer	3.20%	0.68%	0.00%		0.000	0.000	0.001
Other	1.64%	0.45%	0.00%		0.000	0.000	0.001
missing	12.05%	84.50%	100.00%		0.000	0.000	0.001
Second paid job				6.69			
Yes	10.82%	12.91%	7.90%		0.000	0.000	0.001
No	89.07%	86.87%	92.04%		0.000	0.022	0.001
missing	0.11%	0.21%	0.06%		0.000	0.000	0.001
Work statisfaction				1.75			
dissatisifed	6.72%	10.18%	10.39%		0.000	0.000	0.001
neither	5.52%	7.65%	7.49%		0.000	0.000	0.001
satisfied	87.65%	82.07%	82.05%		0.000	0.000	0.001
missing	0.12%	0.10%	0.07%		0.000	0.014	0.001

Source: BHPS & UKHLS

Table 3.5C: *Descriptive Statistics (Division1 Household Characteristics)*

	Sustained self-employed (1,146 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Variables							
Household Characteristics							
Married /Cohabitting				1.73			
Yes	81.45%	79.54%	74.73%		0.000	0.000	0.000
No	18.31%	20.42%	24.72%		0.000	0.000	0.000
missing	0.14%	0.04%	0.55%		0.000	0.000	0.000
Spouse/Partner employed				1.72			
Yes	61.85%	65.82%	64.79%		0.000	0.000	0.000
No	18.90%	13.62%	10.27%		0.000	0.000	0.000
missing	18.35%	20.56%	24.94%		0.000	0.000	0.000
Has Children				1.22			
Yes	43.49%	47.83%	40.93%		0.000	0.000	0.000
No	56.51%	52.17%	59.17%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Responsible for dependent child under age of 16				1.09			
Yes	8.91%	15.93%	20.24%		0.000	0.677	0.000
No	91.09%	84.07%	79.76%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%		0.000	0.000	0.000
Care for other household members				1.84			
Yes	3.03%	2.47%	3.22%		0.000	0.000	0.000
No	86.13%	88.89%	87.71%		0.000	0.000	0.000
missing	10.84%	8.64%	9.07%		0.000	0.000	0.000
Housing tenure				1.35			
Own house outright	23.04%	10.60%	11.57%		0.000	0.000	0.000
Own house mortgage	62.65%	74.90%	69.62%		0.000	0.000	0.000
Rent	13.95%	14.28%	18.48%		0.000	0.000	0.000
missing	0.36%	0.22%	0.33%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 3.5D: *Descriptive Statistics (Division1 Parental Background)*

	Sustained self-employed (1,146 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Variables							
Parents background							
Father employment history				1.22			
Employee	59.87%	66.64%	69.90%		0.000	0.000	0.000
Self-employed	26.68%	18.20%	13.33%		0.000	0.000	0.000
missing	13.45%	15.16%	16.77%		0.901	0.000	0.000
Mother employment history				1.11			
Employee	40.42%	47.80%	50.10%		0.000	0.000	0.001
Self-employed	7.28%	6.55%	3.56%		0.000	0.000	0.001
missing	52.30%	45.65%	46.34%		0.000	0.000	0.001
Father educational qualifications				4.42			
University degree	33.62%	31.60%	30.77%		0.000	0.000	0.000
Further education	14.07%	16.27%	13.03%		0.000	0.000	0.000
School qualifications	18.47%	26.30%	19.34%		0.000	0.001	0.000
None	6.66%	6.07%	4.44%		0.000	0.000	0.000
missing	27.19%	19.77%	32.43%		0.000	0.000	0.000
Mother educational qualifications				4.49			
University degree	35.30%	37.81%	34.42%		0.000	0.000	0.000
Further education	21.74%	27.03%	21.36%		0.000	0.036	0.000
School qualifications	12.56%	15.26%	10.88%		0.000	0.000	0.000
None	3.11%	2.80%	3.04%		0.000	0.079	0.000
missing	27.29%	17.10%	30.30%		0.000	0.000	0.000

Source: BHPS & UKHLS

3.3.4 Methodology.

3.3.4.1 The Multinomial Logit Model

After validating the division criteria with graphical presentations, summary statistics and running the relevant diagnostic tests against multicollinearity and correlation between the explanatory variables, we implement the Multinomial Logit Model for the analysis of this chapter. The MNLM calculates the propensity of characteristics, explores the variations accredited for each worker and tests the previously set hypotheses for this chapter.

The MNLM is the most frequent and widely used nominal regression model in which it represents an extension to the binary logistic type, by modelling the probability of single nominal outcome from mutually exclusive categories (Cheng and Long, 2007; Cameron and

Trivedi, 2010 p:489; Long and Freese, 2014 p:385; Greene, 2012 p:761; Wulff, 2014), contrary to the Probit model, which has been proven to be limited, and with extensively high computation costs when using multivariate analysis (Greene, 2012; Kennedy, 2013). Nevertheless, difficulties arise in interpreting the results in the MNLM due to complexity in the non-linearity nature of the model (Long, 1997; Cameron and Trivedi, 2010; Long and Freese, 2014), as the model includes several parameters that depend on the choices and the numbers of possibilities, making both understanding and communicating results a bit overwhelming (Long and Freese, 2006).

The multinomial data used in the analysis arises from 'individual's revealed preference choice, based on actual decisions and real observed outcomes (Cameron and Trivedi, 2005 p:498). The outcome in this model arises from unordered individuals' choices, therefore an additive random-utility model (ARUM) is documented.

$$U_{ij} = V_{ij} + \varepsilon_{ij}. (3.1)$$

U_{ij} is the utility sum of deterministic individual components. The outcome j signifies the choice of occupation for the ith worker, depending on explanatory regressors and unknown parameters, classified as V_{ij}, along with an unobserved random component termed as ε_{ij} (Cameron and Trivedi, 2010 p:493).

$$V_{ij} = x'_{ij}\beta + z'_{i}\gamma_j. (3.2)$$

V_{ij} is decomposed by alternative specific regressors x_{ij} and case-specific regressors z_i that do not vary across alternatives, but only across individuals. The utility derived from occupational choice depends heavily on x_{ij} that includes the different aspects of workers along with the choice of occupation being made. It is ultimately based on comparing between the different numbers of alternatives and not the alternatives themselves (Greene, 2013).

The disturbance term "ε_{ij}" is independent and identically distributed when the functional distribution is aligned with the MNLM specification (McFadden, 1947).

$$F(\varepsilon_{ij}) = \exp(-\exp(-\varepsilon_{ij})). (3.3)$$

The Additive Random Utility Model assumes that the choice j, made by workers i yields the maximum utility U_{ij} among k utilities. Hence the following statistical model is driven by the following probability:

$$Pr(y_i = j) = Pr(U_{ij} \geq U_{ik}) forall k. (3.4)$$

The outcome Y_i in the MNLM is one of m alternatives for individual i, equal to j when it corresponds to the jth alternative and can be used when all regressors are case/individual specific "x_i" (Greene, 2012 p:762; Cameron and Trivedi, 2005 p:494, 2010 p:498). It indicates the observed respondent choice from the established division of three mutually exclusive groups (the sustained self-employed, dabbled self-employed and always employees).

J is equal to one, when individuals are classified as sustained self-employed, two if they are dabbled self-employed and three if they are paid employees. The case specific independent regressors refer to workers' socio-economic and demographic characteristics in the sample.

The probability that outcome for individual i is equal to alternative j, conditional on x_i regressors is:

$$p_{ij} = Pr(y_i = j) = F_j(x_i, \theta), j = 1, \dots, m, i = 1, \dots, N. (3.5)$$

Where F_j (.) follows a multinomial Logit functional form to ensure consistency so that$E[y_{ij}] = p_{ij}$ (Cameron and Trivedi, 2005 p:496).

The MNLM for occupation choice (e.g. Nerlove and Press, 1973; Boskin, 1974; Schmidt and Straus, 1975a, b) is:

$$Prob(Y_i = j|x_i) = p_{ij} = \frac{\exp(x'i\beta j)}{\sum_{l=1}^{m} \exp(x'i\beta j)}, j = 1, \dots m, i = 1, \dots N. (3.6)$$

Only (m-1) probabilities can be freely specified because they all sum up to one, $\sum_{j=1}^{m} pij$ =1, where one of the βj categories is set equal to zero, and all coefficients are interpreted with

respect to this base category (Cameron and Trivedi, 2010 p:498). The components of x_i do not vary across options/outcomes, they are alternative invariants, and relate to individual specific characteristics that only change across workers. Hence, we compute the propensity of characterises for each worker. We are interested in examining the impact of individuals' observed socio-economic and demographic characteristics, work nature, households' characteristics and parental background on the probability of selection into the three distinct divisions established in this study (the sustainers, dabblers and always employees).

We acknowledge that the drawn sample based on some value of dependent variable may suffer from sample selection bias, hence we tackle the selectivity issue into labour market status in the following empirical chapter by employing the Heckman (1979) selection model.

3.3.4.2 The Maximum Likelihood Estimation

The MNLM uses a convenient form of density, the Maximum Likelihood estimation to evaluate the probabilities of employment choice (Cameron and Trivedi, 2010 p:492). It is identical to the methods used in the binary Logit Model.

The likelihood function for N distinct observations is the product of N densities:

$$L = \prod_{i=1}^{N} \prod_{j=1}^{m} p_{ij}^{yij}. (3.7)$$

The advantages of the Maximum Likelihood estimator (MLE), $\hat{\theta}$ is that it maximises the log-likelihood function, it is asymptotically unbiased, normally distributed, consistent and efficient especially when the sample size is larger, and still suitable even when sample size is small (Cramer, 1986; Eliason, 1993; Cameron and Trivedi, 2005, 2010, Kennedy, 2008 p:22, Long and Freese, 2014 p:85).

$$LnL(\theta) = \sum_{i=1}^{N} \sum_{j=1}^{m} y_{ij} \ln Fj(xi, \theta). (3.8)$$

3.3.4.3 The Relative-Risk Ratios

The coefficients in the MNLM are not directly interpretable and the sign of parameters does not imply any increase or decrease in the probability of any alternative being chosen over the other. Instead the interpretation is only relative and relevant when comparing to a reference category, and when the base coefficients are normalised to zero (Cameron and Trivedi, 2010 p:492). Similar to the Logit model, coefficients can be transformed to relative-risk ratios to show the proportionate change in the relative risk $e^{\beta jr}$ when choosing alternative j from other alternative 1, and when x_{ir} changes by one unit (Cameron and Trivedi, 2010 p:500). This is given by the following equation:

$$\frac{\Pr(Yi = j)}{\Pr(Yi = 1)} = \exp\left(x_i'\beta_j\right). (3.9)$$

3.3.4.4 The Wald Test

To check the adequacy of the model, the Wald test is applied to test the significance of individual coefficients. The reported z statistics check if the dependent outcome y_{ij} is influenced by the variations in the independent explanatory variables x_k, where k is the number of independent variables (Long and Freese, 2014 p:398). It is used instead of the Likelihood-ratio test, because the latter has its computational cost and limitation when data is complex, survey estimation is used, standard errors are robust and sample size is large (Long and Freese, 2014 p:401).

The Wald test hypothesis is:

$$H_0: \beta_{k,\frac{1}{b}} = \cdots = \beta_{k,\frac{j}{b}} = 0. (3.10)$$

The above imposes a constraint on (j-1) parameters, where b is the base outcome and is essentially equal to 0. The test hypothesis claims that the individual socio-economic attributes x_k do not have any impact on the dependent outcome y_{ij}. Only when the set

hypothesis is rejected, do workers' characteristics have significant outcome on the division being made.

3.3.4.5 The Independence of Irrelevant Alternatives assumption

In the MNLM, the Independence of Irrelevant Alternatives assumption (IIA) problem arises when the probability of choosing between two existing alternatives is not affected by the presence of an additional third alternative (Kennedy, 2008 p:251). This means that the probabilities do not depend on the available alternative outcomes when adding or deleting any category and the odds are not affected between the remaining choices (Cameron and Trivedi, 2010 p:511; Greene, 2012 p:767; Long and Freese, 2014 p:407).

The assumption for the IIA problem in the MNLM is:

$$\frac{\Pr(y = m|x)}{\Pr(y = n|x)} = \exp\{x(\beta_{m|b} - \beta_{n|b})\}. (3.11)$$

Initially the Independence assumption follows the primary belief acquired by the multivariate model, that the disturbance terms are independent and homoscedastic, and the choice of membership in one of the categories is independent on the choice of membership of another (Greene, 2012 p:767).

3.3.4.5.1 The Hausman and McFadden test.

The Hausman and McFadden (1984) (HM) test checks the validity of the IIA, by dropping out a subset of choices from the model and checking if the omission is irrelevant when the new estimated parameters do not systematically change (Kennedy, 2013). The test involves fitting the model with all possible alternatives and deriving the estimates $\hat{\beta}_f$, denoted as the coefficients from the full model and comparing the estimates with the estimated coefficients $\hat{\beta}_R$ of the restricted model when eliminating one or more alternatives.

The test statistics are:

$$\text{HM} = (\hat{\beta}_R - \hat{\beta}_f^*)' \left\{ \text{var}\left(\hat{\beta}_R\right) - \text{var}(\hat{\beta}_f^*) \right\}^{-1} (\hat{\beta}_R - \hat{\beta}_f^*). (3.12)$$

The $\hat{\beta}_f^*$ is a subset of $\hat{\beta}_f$, after excluding coefficients that do not fit the restricted model.

The IIA is valid, when the test is asymptotically chi-squared distributed with degrees of freedom equal to the rows of $\hat{\beta}_R$. If the coefficient values of Hausman and McFadden's (HM) test are significant, the IIA assumption is violated and the MNLM is no longer appropriate because the parameters estimated from the excluded choices are inefficient and inconsistent (Greene, 2012 p:767; Long and Freese, 2014 p:408).

However, Hausman and McFadden (1984) concluded the possibility that the IIA would not be violated, even when results are negative. This is also confirmed by the work of Vijverberg (2011), who showed that the problem of negative outcomes that contradicts the asymptoticχ^2 distribution is the result of improper use of the variance matrix that might lead to invalid statistical inference even when the true values are positive.

3.3.4.5.2 The Small Hsiao test

The Small Hsiao (SH) test by Small and Hsaio (1985) is also considered as a common test for the IIA problem and divides the sample into two random subsamples of equal size. It tests the difference in coefficients from the unrestricted model of both subsamples, with the weighted average of coefficients computed and compared with the coefficients of the restricted model. The second subsample is only employed, when all cases from a chosen value of the dependent variable are eliminated (Long and Freese, 2014 p:409).

Sometimes, running both tests can provide conflicting results on whether the IIA has been violated or not. Cheng and Long (2007) examined the properties of both tests and found that (HM) test provides poorer size properties even when sample size is large, whereas (SH) test has more reasonable size properties for smaller sample size (Long and Freese, 2014 p:407). But, they also conclude and reconfirm with Fry and Harris' (1996, 1998) assertion that both tests do not provide useful information when assessing the IIA problem because of the different data structures and size properties that do not improve even when the sample size increases.

Thus, the MNLM would only work well when the alternatives are not similar to one another (Amemiya, 1981). Based on our theoretical argument and reasoning behind the division criteria for our workers, we argue in this thesis that we have three groups of workers that are distinct and relatively different from one another in their observed characteristics, earnings returns and transitions behaviours. Hence, we expect the IIA to hold, as the probability of being sustained self-employed to being an always employee is unlikely to be affected by the existence of the third option of being a dabbler.

3.3.4.6 The Predicted Probabilities

To examine the fit of the MNLM, the Predicted Probabilities (PR) is interpreted in the analysis and computed by the following formula:

$$\hat{\Pr} = (y = m|x) = \frac{\exp(x\hat{\beta}_{m/J})}{\exp(x\hat{\beta}_{J/J})}. (3.13)$$

Assuming J is the base outcome, and x containing values specific to cases in our sample (Long and Freese, 2014). The main consideration to be taken into account is that even after predicting the probabilities, the MNLM is nonlinear with the results. Therefore, no relevant approach can exactly define the relationship between the independent variables and the calculated outcome probabilities (Long and Freese, 2014 p:412).

3.3.4.7 The Marginal Effects

Because there is no single conditional mean for the dependent variable in the MNLM, the Marginal Effects (MEs) are computed to measure the probabilities of m alternatives, and to have an overall and final assessment of the impact of each variable on the observed outcome (Cameron and Trivedi, 2010 p:502; Long and Freese, 2014 p:412). They provide an estimate for the change in the observed outcome due to a change in one independent variable, holding other regressors constant (Long and Freese, 2014 p:162). Where $\bar{\beta}_i = \sum_l p_{il} \beta_l$ is the probability weighted average of β_l (Cameron and Trivedi, 2010 p:502). The MEs vary with the point of

evaluation x_i, because p_{ij} varies with x_i and do not necessarily have the same sign as the coefficients βj (Cameron and Trivedi, 2010 p:502). They measure the magnitude of responses to changes in characteristics, and all sum up to zero, as the probabilities sum up to one (Cameron and Trivedi, 2010 p:502). Hence the marginal effect for a variable for three groups (our groups of sustainers, dabblers and always employees) should be equal to zero. This means that if a covariate increases the probability of sustained self-employed by X percentage points and also the dabbled self-employed by Y percentage points, then the covariate must reduce the probability of always employees by X+Y percentage points.

The interpretation of the results here rely on the marginal effects estimates because they provide much richer and intuitively more meaningful information than the interpretation of normal coefficients (Wulff, 2014). Robust standard errors are adopted to compensate any false inflation of explanatory coefficients caused by the panel data structure.

For individual i, the MEs of a change in the kth regressors on the probability that alternative j is chosen is:

$$\mathrm{ME_{ijk}} = \frac{\partial \Pr(y = j|x)}{\partial xk} = \frac{\partial pij}{\partial xi} = p_{ij}\left(\beta_j - \bar{\beta}_i\right). (3.14)$$

3.3.4.7.1 Approaches in the Marginal Effect

There are three different approaches for MEs, Marginal Effect at Mean (MEM), Marginal Effects at Representative values (MER), and the Average Marginal Effect (AME). The MEM is computed at variables mean, the MER is computed at selected specific values, and the AME is the mean of all MEs computed at observed values for all sample observation (Long and Freese, 2014 p:243). There are reservations for using the MEM because the mean only reflects the centre of distribution and not the variation within the distribution (Maddala, 1983 p:24; Hanmer and Kalkan, 2013; Long and Freese, 2014 p:245-261). Also, there is no actual case in which our regressors in the dataset are equal to the mean because all are categorical variables. The marginal effects for categorical variables show how $\Pr(Yi = 1)$ is predicted to change as

X_k changes from 0 to 1, or in reference to chosen base category, holding all other regressors constant. Greene and Hensher (2010 p:36) argued that the MEM is an appropriate approximation to the AME when the sample size is large; however, Bartus (2005) and Verlinda (2006) insisted on the large difference between the two measures. The AME is considered as superior to the MEM, but not necessarily more informative than the MER when computing MEs for specific subgroups (Cameron and Trivedi, 2005 p:467; Hammer and Kalkan, 2013; Long and Freese, 2014 p:245). We choose to compute the average discrete changes for the standard deviation of our discrete variables, without creating any specific benchmark value.

3.3.4.8 Robustness Checks

For robustness checks, we compute the marginal effects for the other divisions' criteria (divisions 2, 3, 4 and 5) and compare with the results of our initial approach. We also estimate a logit model for the general group of self-employed and compare the marginal effect estimates with our group of dabblers and sustainers. The main aim behind these comparisons is to validate the choice of the initial approach (division 1) used in defining the dabbled and the sustained self-employed, and the always employees.

Additionally, we alter the panel data structure, by collapsing all yearly observations into one period of time and looking at the effect of time-invariant explanatory variables on our own division (division 1). The intuition behind this last step is to remove the falsely inflated coefficients caused by the repeated values of the explanatory variables over time. Significantly, the data loses its panel structure and is considered as a cross-sectional study, where the interpretation is based on the ranking and the average of time-invariant regressors.

All the following procedures are employed, along with the relevant diagnostic tests to test the validity of the model used and the choice behind the division criteria for splitting the self-employed into dabbled and sustained self-employed and differentiating them from the always employees. Also, to have an effective inference on the distinction observed, to calculate

the propensity of characteristics for each worker, and identify the differences in the observed socio-economic characteristics between our division.

3.4 Results

In this section, we report and discuss the results for the MNLM for our main division (division1). We then compare with the simple logit model marginal effect estimates for our combined group of self-employed and paid workers (the results are found in table 6 of appendix A), and the multinomial logit results for the altered divisions criteria (the results for division 2,3,4 and 5 are found in tables 7, 8, 9 and 10 of appendix A, respectively) and for the altered panel structure (in table 11 in appendix A).

As previously mentioned, we do not base the analysis on the coefficient interpretation because the sign and size do not indicate the direct relationship of interest (Green, 2003). The interpretation of a single coefficient is based on the contrast of only two categories, indicating how the predictor relates to the probability of observing one category relative to the base category, thus leading to invalid inference and creating uncertainty in the results of the empirical work (Cameron and Trivedi, 2005). The Marginal Effect method is a much more powerful interpretive device and is used in the interpretation of the results here. It provides the analysis with richer and more intuitively meaningful information that is not available through the interpretation of normal coefficients and informs on the changes in the predicted probabilities due to changes in a particular predictor (Wulff, 2014). Also, it provides us with valid conclusion on the magnitude and the exact direction of the relationship between the independent variables and the observed outcomes (Bowen and Wiersema, 2004). Thus, we rely on the interpretation of these average marginal effect estimates for our regressors in the model.

Table 3.6 reports the findings of the marginal effects estimates for our main division, after running the MNLM in the panel data structure. The model fit is of a reasonable fit with pseudo-R^2 equal to 0.194, all regressors are jointly significant at 5 percent significance level

with LR chi2 (92) equal to 14869.79, with the probability of chi2 equal to zero, rejecting the null hypothesis of joint insignificance.

3.4.1 Individual Characteristics.

3.4.1.1 Gender

The variable gender is highly significant at 99.99 percent confidence level for all three subdivisions of workers. The percentage point probability for male workers in reference to women is higher for both subgroups of self-employed and negative for the always employees. In reference to women, men are 9.0 percentage point more likely to be sustained self-employed, and 7.5 percentage point more likely to be dabbled self-employed. Whereas, for the always employees, female workers have a higher percentage probability point than male workers by 16.5 percentage point.

3.4.1.2 Ethnicity, Country of Birth and Language.

Ethnicity does not appear to play a significant role in predicting the belonging for the sustained self-employed (the ethnic variable is statically insignificant for sustainers in table 3.6 below) but is highly significant for the dabblers (at 1 percent significance level) and the always employees (at 5 percent significance level). Non-white in reference to white ethnic backgrounds have a higher percentage probability to be observed as always employees (by 2.9 percentage point), and negatively as dabbled self-employed (by -2.1 percentage point).

UK born in reference to non-UK born are less likely to be observed as sustained self-employed (by -0.6 percentage point as sustained self-employed significant at 99.99 percent confidence level) and as always employees (-3.9 percentage point). Whereas, the opposite is shown for the dabbled self-employed (4.5 percentage point more likely to be observed as dabblers).

Workers who consider English as their first language in reference to non-English language decrease the probability of being observed as sustained self-employed (by 8.2

percentage point, significant at 1percent significance level). Whereas, the opposite effect is shown for the always employees (increase in probability by 2.7 percentage point, significant at 1percent significance level) and more predominantly for the dabbled self-employed (increase in probability by 5.5 percentage point, significant at 1 percent significance level).

3.4.1.3 Age

In reference to the age band between 40 and 49, the younger generation of workers, 16 to 24, have significantly lower marginal probabilities to be observed in both subdivisions of self-employment (by -7.8 percentage point for sustainers and -1.2 percentage point for dabblers), but are more likely to be observed in paid employment (by 9 percentage point, significant at 1 percent confidence level). Those between the age of 25 and 39 are significantly more likely to be observed as paid employees (by 2.7 percentage point), and as dabbled self-employed (by 0.6 percentage point). Whereas, the effect is significantly negative for workers from older age groups between the age of 50 to 64 and 65 and over (workers from the age of 60 to 64 and 65 and over in reference to those between the age 40 to 49 are less likely to be observed as dabbled self-employed, by significant -0.9 and -3.2 percentage points, respectively, and for always employees, by significant -2.6 and -8.9 percentage points, respectively). As for the sustained self-employed, they are significantly more likely to be from older age groups (3.6 percentage point more likely to be aged 60 to 64 in comparison to 40 and 49, and 12.22 percentage point more for those aged 65 and over, all significant at 1 percent significance level).

3.4.1.4 Health Status and Disability

Information on health status shows that both subgroups of self-employed have higher probability in reporting good health status compared to fair. Whereas, the effect is negative for the always employees, but insignificant. This also confirms with the findings of workers who consider themselves, or are registered as, disabled in reference to not, where the results show significantly negative probability for both subgroups of self-employed (by -0.8 percentage

point for sustainers, and -1.1 percentage point for dabblers) and positive values for the always employees (by 1.9 percentage point).

3.4.1.5 Qualifications

Workers with a higher degree compared to none have a significant positive marginal probability for the dabbled self-employed (3.4 percentage point, significant at 1percent significance level) and higher than the always employees (1 percentage point). There is a similar case for A-levels, however the results are not significant. GCSE levels compared to none are negative for the dabbled self-employed (-0.8 percentage point, but insignificant), but positive for the always employees (2.1 percentage point, significant at 99.99 percent confidence interval). Whereas, for other qualifications, the marginal probabilities are insignificant between the two compared groups, but still show positive marginal probabilities for the dabbled self-employed (1.1 percentage point, but insignificant) and negative (-0.3 percentage point, also insignificant) for the always employees. As for the sustained self-employed, the results go in different directions, with all negative significant marginal probability values for all educational levels in comparison to none (only insignificant in correspondence to other qualifications). Also workers with vocational qualifications compared to none do not have any significant impact on all our workers.

3.4.2 Work Nature

3.4.2.1 Industry level

In reference to medium skilled industry, both subgroups of self-employed have positive marginal probability in being in highly skilled industry, but with dabblers higher than sustainers (3.1 compared to 1.8 significant percentage point, respectively), and negative estimates for low skilled industries (-3.5 percentage point for sustainers and -0.6 percentage point for dabblers, significant at 1 percent significance level). On the other hand, the marginal effect estimates are significantly negative for the highly skilled industries in reference to medium skilled industries

for the always employees (-4.9 percentage point) but are positive for the low skilled ones (4.2 percentage point).

3.4.2.2 Second work

Workers with secondary paid work compared to none have significant positive marginal probabilities for both subgroups of self-employed but are higher for the dabbled self-employed (8 percentage point, significant at 1 percent significance level) compared to the sustained self-employed (3 percentage point, significant at 1 percent significance level). Whereas, the percentage point values are significantly negative for the always employees (-11 percentage point, significant at 1 percent significance level).

3.4.2.3 Job satisfaction

Looking at workers' job satisfaction, and comparing to not being satisfied, the two groups of self-employed report positive marginal probability on satisfaction, but sustainers are higher than dabblers (3.5 percentage point compared to 0.3 percentage point, significant at 1 percent significance level). Whereas the always employees have negative marginal probability on the job satisfaction (-3.7 percentage point, significant at 1 percent significance level)

3.4.3 Household Characteristics

3.4.3.1 Marriage/cohabiting and Partner employability

Being married or cohabiting with a partner in reference to not has a negative marginal probability for both subgroups of self-employed (-0.7 percentage point for sustained self-employed, and – 4.5 percentage point for dabbled self-employed), whereas, for the always employees there is higher probability for married or cohabiting workers (5.2 percentage point), but the results are insignificant. This is also demonstrated in regard to spouse or partner employment in reference to not being employed; as such the probabilities are significantly negative for sustainers and dabblers (-7.4 percentage point for sustained self-employed, and -

4 percentage point for dabbled self-employed), and positive for the always employees (11.4 percentage point, significant at 1 percent significance level).

3.4.3.2 Children, responsibilities, and dependent care

Respondents with children and responsible for a dependent child under the age of 16 in reference to none increase significantly the probability to be observed in both subgroups of self-employed (1.2 percentage point for sustained self-employed, and 1.1 percentage point for dabbled self-employed), but oppositely for the always employees (-2.4 percentage point, significant at 1 percent significance level). Whereas, respondents who care for other household members, in reference to not, have positive significant marginal probability for the always employees (5.8 percentage point, significant at 1 percent significance level) and negative for sustainers (-3.1 percentage point) and dabblers (-2.6 percentage point).

3.4.3.3 House Ownership

Workers who own their home in reference to those who rent are significantly more likely to be observed in self-employment as opposed to paid employment (significant negative marginal probability in both owning outright, -6.1 percentage point and by mortgage, -0.9 percentage point for the always employees). However, the sustained self-employed have a higher positive marginal probability in owning their homes outright than dabbled self-employed (3.5 percentage point compared to 0.3 percentage point, significant at 1 percent significance level, respectively), and these latter are higher in owning with mortgages (2.3 percentage point for dabblers compared to 0.7 percentage point for sustainers, significant at 1 percent significance level, respectively).

3.4.4 Parental Background

Parental occupation indicates that those with fathers who were previously self-employed in reference to being paid workers have a significant positive marginal probability for both self-employed subcategories, with sustainers higher than dabblers by 5.4 percentage point, and

negative for the always employees (-9.2 percentage point). A similar case is also shown for mothers who were previously self-employed, but with dabblers having significant higher marginal probability than sustainers by 1.7 percentage point, whereas still negative for the always employees (-8.9 percentage point).

Table 3.6: *Multinomial Logit Model (Division1) Marginal Effect Estimates*

	Sustained self-employed (1,146 respondents)			Dabbled self-employed (1,149 respondents)			Always employees (9,362 respondents)		
Variables	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values	Marginal effect	tandard Erro	P-values
Individual Characteristics									
Male *(reference to female)*	0.090	0.002	0.000	0.075	0.003	0.000	-0.165	0.003	0.000
Non-white *(reference to White)*	-0.009	0.006	0.111	-0.021	0.008	0.000	0.029	0.009	0.028
UK born *(reference to non-UK born)*	-0.006	0.005	0.183	0.045	0.006	0.000	-0.039	0.007	0.000
English language *(reference to non-English)*	-0.082	0.007	0.000	0.055	0.006	0.000	0.027	0.008	0.001
Age groups *(reference to 40-49)*									
16-24	-0.078	0.003	0.000	-0.012	0.005	0.012	0.090	0.005	0.000
25-39	-0.033	0.002	0.000	0.006	0.003	0.026	0.027	0.003	0.000
60-64	0.036	0.003	0.000	-0.009	0.003	0.005	-0.026	0.004	0.000
65+	0.122	0.010	0.000	-0.032	0.009	0.000	-0.089	0.012	0.000
Healthstatus *(reference to fair)*									
Good	0.005	0.002	0.032	0.001	0.003	0.821	-0.006	0.004	0.095
Poor	0.001	0.004	0.882	-0.011	0.005	0.035	0.011	0.006	0.091
Disable *(reference to not disabled)*	-0.008	0.004	0.028	-0.011	0.005	0.021	0.019	0.005	0.001
Highest Educational Qualifications *(reference to none)*									
Higher degree	-0.044	0.004	0.000	0.034	0.005	0.022	0.010	0.005	0.000
A-levels	-0.016	0.005	0.000	0.010	0.005	0.252	0.006	0.006	0.090
GCSEs	-0.013	0.004	0.002	-0.008	0.005	0.079	0.021	0.006	0.000
Other qualifications	-0.008	0.005	0.111	0.011	0.006	0.064	-0.003	0.007	0.703
Vocational qualifications *(reference to none)*	0.002	0.002	0.347	-0.003	0.003	0.184	0.001	0.003	0.680
Work Nature									
Industry levels *(reference to medium skilled)*									
High skilled	0.018	0.002	0.000	0.031	0.003	0.000	-0.049	0.003	0.000
Low skilled	-0.035	0.002	0.000	-0.006	0.003	0.039	0.042	0.004	0.000
Second paid jobs *(reference to none)*	0.030	0.003	0.000	0.080	0.004	0.000	-0.110	0.005	0.000
Job satisfaction *(reference to Not satisfied)*									
Satisified	0.035	0.003	0.000	0.003	0.004	0.456	-0.037	0.004	0.000
Neither	0.086	0.005	0.000	0.003	0.005	0.617	-0.009	0.006	0.120
Household Characteristics									
Married/ Cohabitting *(reference to not married nor cohabitting)*	-0.007	0.021	0.740	-0.045	0.030	0.127	0.052	0.031	0.094
Spouse/Partner employed *(reference to not working)*	-0.074	0.004	0.000	-0.040	0.004	0.000	0.114	0.005	0.000
Has children *(reference to no children)*	0.008	0.002	0.001	0.007	0.003	0.026	-0.015	0.004	0.000
Responsible for dependent child under age of 16 *(reference to n*	0.012	0.004	0.004	0.011	0.005	0.014	-0.024	0.005	0.000
Care for other household members *(reference to not)*	-0.031	0.004	0.000	-0.026	0.006	0.000	0.058	0.006	0.000
House tenure *(reference to rent)*									
Owned outright	0.050	0.003	0.000	0.011	0.004	0.006	-0.061	0.005	0.000
Owned with mortgage	0.007	0.002	0.005	0.023	0.003	0.000	-0.030	0.004	0.000
Parents background									
Father self-employed *(reference to employee)*	0.073	0.003	0.000	0.019	0.003	0.000	-0.092	0.004	0.000
Mother self-employed *(reference to employee)*	0.036	0.005	0.000	0.053	0.006	0.000	-0.089	0.007	0.000

Number of Observation= 107,360
LR chi2(92) = 14869.79
Prob > chi2 = 0.0000
Pseudo R2 = 0.1937
Log likelihood = -71903.869

Source BHPS & UKHLS

3.4.5 Specification Tests

3.4.5.1 Wald test for Independent Variables

Table 5 in appendix A includes all specification tests used for the analysis of our division in this chapter. The Wald test specification for the significance of the independent variables used in the specification model shows the significance for most of the independent variables used in the analysis, except for the good health status, other educational qualifications, vocational qualification, job satisfaction, and the marriage and cohabiting variable, all reporting insignificant values in the Chi2 probabilities.

3.4.5.2 Wald Test for Combining Alternatives

The results of the Wald test for combining alternatives show significant results that all alternatives are mutually exclusive from one another with Chi2 probabilities equal to 0.000. Hence this justifies that we are examining the characteristics of three exclusive groups of workers.

3.4.5.3 IIA tests

The results of the Hausman and the Small Hsaio test for the IIA assumption in table 5 in appendix A report insignificant coefficient values for the three groups of workers (sustained self-employed; Hausman test Chi2 probability equal to 0.99, and Small Hsaio test Chi2 probability equal to 0.233, dabbled self-employed; Hausman test Chi2 probability equal to 0.082, and Small Hsaio test Chi2 probability equal to 0.082 and for the always employees; Hausman test Chi2 probability equal to 0.067, and Small Hsaio test Chi2 probability equal to 0.061). This means that the parameters do not systematically change if we drop any subset of choices from the model and the IIA assumption is not violated. Thus, being a sustained self-employed relative to being an always employee is unlikely to be affected by the existence of the third option of being a dabbler. This confirms that the MNLM is the appropriate model to use in the analysis and with our initial division reasoning; that we have three groups of distinct

workers, the sustained self-employed, the dabbled self-employed and the always employees in the labour market, who are different from each other with respect to their observed socio-economic and demographic characteristics.

3.4.5.4 Predicted Probabilities

The MNLM sample average predicted probabilities in table 5 in appendix A that are not equal to the observed sample frequencies, and there is considerably more variation in the predicted probabilities for each alternative with the mean and the standard deviations. The predicted probability for the sustained self-employed mean is less by 0.006 points than the observed sample mean of sustainers and ranges from minimum of 0 to maximum 1. The dabbled self-employed are less by 0.042 points in their mean values and the predicted probabilities for the always employee are higher by 0.106 points in comparison to its mean. Still, the results show that the model prediction is of good measure considering the computed average predicted probabilities along with the associated confidence interval are closely aligned with the observed sample figures.

3.4.6 Robustness Checks

3.4.6.1 Comparing with the combined group of self-employed

Comparing our main division results with the logit computed marginal effect estimates for the combined group of self-employed, we find that for all our regressors the marginal effect probabilities are almost the same when comparing the sustained self-employed with the general group of self-employed but are different from the dabbled self-employed. These latter have also different marginal computed probabilities from the general group of paid workers.

Hence this confirms with our main division reasoning that sustainers have characteristics more closely aligned to self-employment, thus keeping them more attached to this labour market status and are different from the dabbled self-employed. These latter are unique in their own observed socio-economic and demographic characteristics and are distinct from paid workers.

3.4.6.2 Altering the Division Criteria

When altering the proportions of the division criteria between the sustained and dabbled self-employed, the analysis shows similar results to the one attributed here. Table 7 in appendix A represents the computed marginal effect results for the MNLM of division 2 (where respondents are observed one-third of the time and more in the dataset, have maximum two spells of either unemployment and inactivity. Sustainers are seen 60 percent of their total employment time in self-employment. Dabblers are seen at least seen once in self-employment but less than 60 percent of their total employment, and the always employees seen 100 percent of their total employment time in paid employment time only). Table 8 in appendix A reports the marginal effects estimates for division 3 (using the 50 percent benchmark to distinguish between the dabbled and the sustained self-employed). Both tables show similar results to our main division (the 0.55 proportion), hence validating the choice behind how our main division is constructed.

The third alteration compared sustainers and dabblers with workers who we always observe in self-employment, similar to the notion of always employees, while keeping the initial division criteria intact (only this affected the sustained self-employed, where we identify them now as workers observed 55 percent of their total time in self-employment but less than 100 percent). The rationale behind imposing such division is to check whether sustainers are similar to workers who we always observe in self-employment, thus we can classify them as more attached to self-employment than dabblers. Respectively, table 9 in appendix A states the computed marginal effects coefficients for this approach (division 4) and shows sustainers to have similarly aligned attributes to the always self-employed, whereas dabblers are different.

The fourth alteration kept the same criteria of our initial division but without imposing any restrictions on the number of spells for unemployment and inactivity for our workers. Table 10 in appendix A presents the findings of division 5, that adds additional explanatory variable,

looking at the total number of waves seen in unemployment and/or in inactivity, in reference to two waves. The results of the computed marginal effect probabilities between our workers do not change. In reference to two spells of unemployment and/or inactivity, the always employees are more likely to have more than two spells of unemployment and/or inactivity, whereas the sustained self-employed and dabbled self-employed report negative marginal probabilities.

3.4.6.3 Altering the Panel Data Structure

Table 11 in appendix A provides the average marginal effects estimates, when collapsing all yearly based observations of the panel data into one, for the time-invariant explanatory variables of our original division. The intuition behind this step is to remove the falsely inflated coefficients caused by the repeated values of some explanatory variables over time. The data loses its panel structure and is considered as a cross-sectional study. The interpretation is based on the ranking and the average of regressors, thus any time-varying explanatory variables are eliminated in the model, and only time-invariants are kept (like gender, ethnicity, origin, language, father and mother self-employment history). The model fit is low with pseudo-R^2 equal to 0.0917. This is conceivable as less independent regressors are reported in the model. All time-invariant regressors are jointly significant at 0.05 significance level with LR chi2 (22) equal to 15190.20 and the probability of chi2 is equal to zero, rejecting the null hypothesis joint insignificance. And the results of table 11 also conform with the findings of table 3.6, hence validating more our main division approach.

3.5 Discussion

Following the results shown in the previous section of this chapter, we reject partially hypotheses 1 and 2, where we find dabblers to exhibit unique sets of attributes. Surprisingly, dabblers have more advantages (are not from ethnic minority groups) than the always employees and are better off (with respect to their educational qualifications) in the labour

market. The dabbled self-employed are more male oriented, less likely to be from non-white ethnic background, are UK nationals, consider English to be their first language, middle aged workers, reporting better health conditions, less likely to be or consider themselves as disabled, have higher educational qualifications, higher degree achievement and A-levels, work in highly skilled industries and report higher job satisfaction, own their homes (either by mortgage or outright) as opposed to renting and with both parents previously self-employed rather than paid workers. Also, they are more skilled than the sustained self-employed, with respect to their years of education, qualifications and skill levels, but are not well embedded in self-employment like these latter group. Hence, their dabbling state doesn't align with the disadvantage hypothesis stated earlier and explained in the previous chapter of this thesis.

Hypothesis 3 is fully supported, whereby the sustained self-employed are different from paid workers in all observed aspects. Also, the results align with the discussion above that the sustained self-employed are more likely to have features closely aligned to self-employment, because the results show that sustainers have similar characteristics to the general group of self-employed and to the always self-employed in division 4. For instance, women compared to men are significantly less likely to be observed as sustainers relative to employees and sustainers are more likely to be in older age group of workers. Indeed, age increases the probability of entering self-employment and this confirms with D'Arcy and Gardiner's (2014) findings. But the sustained self-employed are less likely be seen to be white workers, born in the UK and native English speakers relative to employees, and report no or low educational attainment. The results are also consistent with Urwin (2011)'s findings where the self-employed report mostly intermediate level of educational qualifications.

Hypothesis 4 is partially supported, with sustainers having specific attributes that pull them and keep them more attached into self-employment than dabblers but are not more advantaged with respect to their educational qualifications. Sustainers are better off than

dabblers, reporting better health conditions, fewer disabilities, higher work satisfaction, owning their home outright and having lower probability to own by mortgage settlements, higher probability to be married/cohabiting with spouse/partner not needing to be employed and with previous self-employed fathers. On the other hand, the dabbled self-employed have a higher percentage probability of previous self-employed mothers, employed spouse/partner providing secure income for financial reassurance, report relatively the highest levels of educational attainments, and higher probability of working in highly skilled industries.

3.6 Conclusion

According to the exploratory endeavours of this empirical chapter, it is clear that both subgroups of self-employed are different and have more advantaged characteristics than paid workers, where these latter groups have a higher probability of belonging to minority groups (women, disabled, non-white ethnic background, non-UK born). Thus, the high barriers to entry are shown to exist in self-employment and not in paid employment, as the self-employed need to acquire certain attributes to help them remain in this type of employment. To sum up, the results indicate that sustainers have characteristics more closely aligned with the general and amalgamated group of self-employed and the always self-employed in division 4, and in that sense with self-employment. But we were unable to validate their entrepreneurial orientation, because relatively they are not the more skilled workers in our sample.

Unexpectedly, the attention shifts from sustainers to dabblers, whom we see as more advantaged than the other two groups of workers, with respect to their educational qualifications and industry skill levels. In some sense, they are in between these two stages of employment, where indeed they have a propensity towards self-employment but at the same time and to some extent they engage in paid employment. Still, the results so far do not help us explain the pattern and logic behind their dabbling pattern between states, and the empirical testing was not able to depict any causal or direct relationship concerning the effect of

individuals' socio-economic attributes on the probability to dabble in self-employment. This needs to be further investigated in the following chapters. The main conclusion that can be drawn from this empirical chapter is that we have three groups of workers that are distinct from one another in the labour market. The two extremes in employment are the sustained self-employed and wage earners, and in between are the dabbled self-employed, who are different from both and have their own unique attributes. It is crucial to note that dabblers are not the marginalised group of workers we expected them to be; on the contrary, they represent the highly skilled force in the sample that for some reason dip in and out from different employment states to practice their work. This implies that we may have a sequential of highly professionals and advantaged portfolio workers possibly making the best out of self-employment and paid employment jobs as they arise. This sheds new light on a number of important academic and policy debates, arising from the creation of a new distinction amongst the self-employed, with this dabbling form of work. where these workers reflect a labour market 'power' of sorts and are pulled rather than pushed into self-employment. Hence, the following chapters will help us further explain the uniqueness of this group of workers and determine the purpose behind their dabbling pattern.

Chapter 4: Returns to Education

4.1 Introduction

Looking at what has been established in the previous empirical chapter, we distinguish between two types of workers who are involved in self-employment activities: the dabbled self-employed, who pursue self-employment for a short period and switch between self-employment and waged employment. These workers are at the margin between these two labour market states. And the sustained self-employed who spend most of their employment time and endure longer in self-employment. The aim behind the established division is to contribute to a new categorisation of the self-employed based on the time seen in self-employment and to create three groups of workers that represent the actual scene in the labour market. Also, the rationale behind this partition is that workers who dabble in and out of self-employment exhibit different patterns of behaviours to those who sustain longer in self-employment and to paid workers who are only committed to wage employment. They are also different with respect to their observed socio-economic and demographic characteristics, earnings returns and control over their Human Capital.

The empirical results so far revealed that the dabbled self-employed are different from the sustained self-employed and paid workers. They are more likely to be advantaged in their observed attributes (not from an ethnic minority, more likely to be UK nationals, English is the first spoken language etc.) than paid workers and are more skilled than the sustained self-employed with respect to their human capital accumulation and skill levels (highest reported attained educational qualifications, and work in higher skilled industries). Hence, these workers are unique in their nature, dabbling pattern and characteristics.

In this chapter, we extend the field of work and focus our attention on estimating the earnings returns to human capital for our division of workers. We are specifically interested in the effect of formal education on individuals' earnings. We expect different returns to

education between the sustained and dabbled self-employed and the always employees, due to the previously looked at differences with respect to their observed characteristics, and because of the different levels of control and use of their own human capital.

The estimation of returns between the self-employed and paid employees has always been a problematic matter, as the self-employed are self-selected in ways that are unobservable, because they are different in their observed characteristics, motivation, reasons behind why they choose to become self-employed and their control over their own human capital. Thus, any comparison of returns would lead to biased estimates due to the inter- and intra- differences within workers in self-employment and between paid employment, rather than providing insight into the different returns that an individual can expect from being a self-employed versus a paid employee.

Correspondingly, the aim of this chapter is to capture the effect of formal education on individuals' earnings for the three distinctive types of workers in our sample. The analysis here follows the same approach made in the previous work regarding the division of workers within self-employment and between paid employment. We use the same representative household panel data; the BHPS and its successor; the UKHLS. We run the semi-log Mincerian earnings' regression for our homogenous group of self-employed and employees. Then, we compare the results with our division of workers, the two subgroups of self-employed and the always employees. This chapter also deals with the endogeneity problem of education by employing Instrumental Variable techniques and considers the self-selection bias into occupational choice via the Heckman selection model.

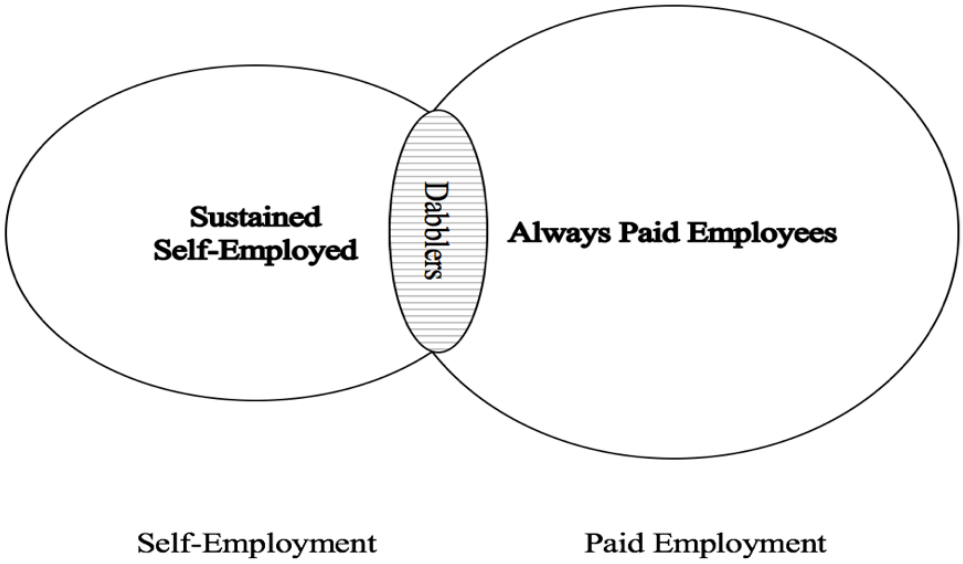
In this chapter, we narrow the definition of the lifelong learning (the accumulation of knowledge and skills gained throughout a person's life and beyond early adulthood (e.g. Blanden *et al.* (2012)) based on the highest certified reported qualification by respondents in our sample and computed into years of education. It is important to understand the economic

returns to education, especially to what extent formal education impacts self-employment activities in the economy and how education affects the earnings for our heterogeneous group of self-employed as opposed to wage earners, as it is understood that investments in human capital increase individuals' performance and competence as entrepreneurs, and returns are important for policy makers to evaluate the spending amount on educational policies in the economy. Also, it is important to fill in the disparity found in the literature, where studies examining the magnitude of returns to education and experience for the self-employed and paid employees have been mixed and limited by numbers, as the evidence in the UK is diverse and varies significantly, depending on the data and empirical methodology used, along with the difficulties in measuring self-employed income and the assumptions made. Thus, the results found do not offer any kind of comparison with other studies, and only limited works have used data for more than one-year period. This chapter attempts to estimate the true causal effect of formal education on self-employed earnings, throughout the whole period of investigation (twenty-three years) and deals with the potential bias estimates on the returns to education.

In the previous empirical chapter, we established the division criteria between the sustained self-employed, the dabbled self-employed and the always employees, and focused on the characteristics of workers. We hypothesised that dabblers are more likely to have disadvantaged attributes in the labour market than the sustained self-employed and wage earners. This is because they do not maintain for long in self-employment nor in paid employment. Also, we assumed that the sustained self-employed are more likely to be more skilled and have specific characteristics that keep them attached to self-employment. So, dabblers resemble to some extent the sustained self-employed as they show tendency towards self-employment jobs, but at the same time they are like paid employees because they also engage in paid employment. Their dip-in and out pattern shows that this group of workers is in-between these two states of employment, whereby they have a propensity to engage in self-

employment but at the same time they also enter paid employment. Hence, they constitute the grey area of distinction between these two types of employment. This reasoning is visually presented in figure 4.1 of the model framework.

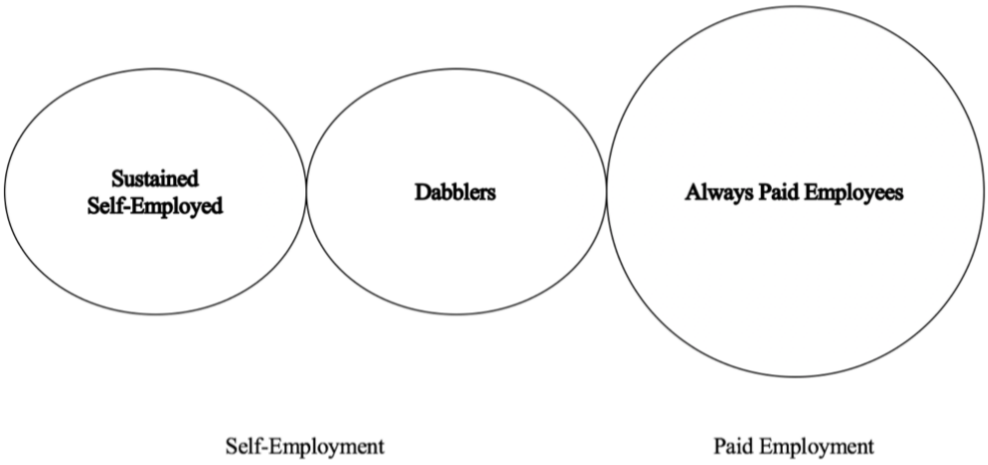
Figure 4.1: Model Framework 1



The results of the previous empirical chapter showed that both subgroups of self-employed have more advantaged characteristics than paid employees, where the sustained self-employed are more likely to resemble the general definition of self-employed (having attributes that are closely aligned with the literature on the characteristics of self-employed workers). An interesting shift, from the author's perspective, is that the dabbled self-employed were found to be the highly skilled workers who achieve the highest educational attainments compared to the sustained self-employed and to the paid employees. Evidence also showed that this group of workers is not disadvantaged with respect to their observed socio-economic and demographic characteristics and is quite different from the sustained self-employed and the

always employees. Thus, our model framework shifted to the newly-updated framework shown in figure 4.2 below.

Figure 4.2: Model Framework 2



Following these results and to further validate the above diagram, this chapter focuses on estimating the earnings returns for the dabbled self-employed, the sustained self-employed and the paid employees. We start by computing the earnings returns for the self-employed as a combined group of workers and compare the results with the returns for the general paid employees. Then we show how the findings differ for our division of workers; self-employed sustainers, self-employed dabblers and always employees. We apply Fixed Effect and Instrumental Variable techniques to account for the endogeneity problem of education and consider the self-selection bias into occupational choice using the Heckman selection model. We also take into account the non-constant returns to education and run some sensitivity analysis by estimating the earnings returns to education for the different divisions criteria and we compare the results. The aim of this chapter is to extend the literature on the returns to education for the self-employed by accounting for a different and a new type of heterogeneity

within self-employment [the dabbling pattern] and to unravel the challenges in the economics of education for the self-employed.

The main objectives of this chapter are:

- To examine how formal education is rewarded differently between the general group of paid workers and the self-employed and how the results vary between our group of dabbled and sustained self-employed, and always employees.
- To identify the alternative approaches to capture the returns to education for our division of workers.
- To overcome the econometric challenges associated with the non-random selection into self-employment and paid employment.

This chapter proceeds as follows. Section 2 gives a brief history on the returns to education, the human capital theory, the signalling theory and the personal control theory., followed by the evidence on the returns to education for the self-employed and employees and considering heterogeneity within self-employment. In this section, we also derive and develop the hypotheses to be tested. Section 3 describes the data and variables used, provides summary statistics and presents the econometric approach. Section 4 reports and discusses the results and section 5 provides a conclusion for the chapter.

4.2 Literature

4.2.1 Human Capital Theory and Earnings Returns

The Human Capital Theory pioneered by Becker (1962) and Schultz (1963) explains how education increases individuals' earnings by affecting their productivity levels. Formal education, training and work experience are considered as human capital investments, requiring human capability and capacity as capital investments (Blundell *et al*., 1999). The costs of acquisition are attributed to tuition and training fees, forgone earnings while studying and low wages when working part-time or doing training jobs. While the returns to such

investment are the benefits of higher future earnings and firms' profitability (Psacharopoulos and Patrinos, 2004), individuals choose to acquire human capital up to the point where the returns to education are equal to the returns on other assets. Thus, people invest in education until the difference between the marginal cost and marginal return to education is equal to zero (Walker and Zhu, 2001 p:5).

Many studies attempt to test the human capital theory and explain the positive returns to education (e.g. Riley (2001); Chevalier *et al.* (2004)). The standard method for estimating the rate of returns to an additional year of schooling is developed by Mincer (1974). The earnings' regression consists of regressing the natural logarithm of hourly deflated pay on years of schooling, work experience and other factors that influence a person's own human capital. The additional assumption of this framework assumes that there exists a linear relationship between education and (log) wages and a quadratic function with work experience to capture the concavity of the earning profile.

Early UK evidence (e.g. Harmon and Walker (1995, 1999); Chevalier and Walker (2002)) suggests relatively large returns to earnings, 15 percent to 20 percent for an additional year of schooling. Later studies report an estimate of 5 to 15 percent higher returns to an additional year of schooling (Hartorg and Oosterbeek, 2007). And, most recent studies (e.g. Devereux and Hart (2010); Grenet (2013); Buscha and Dickson (2016)) suggest relatively smaller returns, 3 to 8 percent. The disparity in the returns to education can be attributed to the role of the life-cycle effects, with the returns not being constant over time, and the usage of data from different periods.

Mincer (1974) using the 1960 US census data found that the returns to schooling were 10 percent and 8 percent for work experience. Psacharopolous and Layard (1979), using the General Household Survey in the UK, found the returns to be at similar level for schooling and experience at 10 percent. But there are large variations in the returns across countries, with US

estimates higher than those for Europe (Trostel *et al*., 2002), and across gender, where the returns are higher for women (8 to 12 percent, in comparison with 7 to10 percent for men in Great Britain) (Dearden, 1998; Chevalier *et al*., 1999).

The UK has the upper end of returns to education for men and women in Europe (9.6 percent for men and 12.2 percent for women) after Ireland, followed by Germany, Greece and Italy, whereas the Nordic countries (Norway, Sweden and Denmark) have the lowest average returns to education (e.g. Harmon *et al.'s* (2001) study, using the International Society Survey Programme (ISSP) for the year 1995). Also, the UK estimates are shown to be more stable over time than the US estimates (e.g. Trostel, Walker and Wooley (2001)'s work using the same dataset: 12.7 percent for British men compared to 7.4 percent in the US and 13 percent for British women compared to 9.6 percent for the US). But, still the OLS estimates are considered downward biased compared with the IV estimates that are in order of 15 percent (Chevalier *et al.*, 1999).

Comparable estimates of the returns to education over time are difficult to find in the UK and surprisingly few researches have been conducted into the private returns to education for this country, due to data constraints (Silles, 2007 p:391; Walker and Zhu, 2003 p:19; Buscha and Dickson, 2012). Hence, there is a great deal of heterogeneity in the rate of returns estimated across countries that is difficult to explain, although the estimates are generated using uniform procedures and comparable data across countries.

The coefficient on education is interpreted as the financial rate of returns to education, showing the cost of education to be only the opportunity cost of forgone earnings (Walker and Zhu, 2001 p:1). It is worth noting that this coefficient cannot reflect the effect of education on productivity when education is correlated with unobservable characteristics that are also correlated with wages (Harmon *et al*., 2000 p:2). Therefore, there is a concern that education may have a value in the labour market not just through increasing productivity of workers but

because of spurious reasons (Harmon *et al*., 2003 p:134). In addition, the human capital theory does not give a proposition about the relative magnitude of returns to education for entrepreneurs and how it differs for employees (Weick, 1996).

In this chapter, we follow the same approach used for testing the HCT. The analysis here uses the Mincer (1974) semi-log earning function for our division of workers; the always observed workers in paid employment and the sustained and the dabbled self-employed. This constitute regressing the natural logarithm of hourly wages for each type of workers on years of education and other factors that influence the human capital accumulation, along with the work experience gained over time. We are interested in finding out how the coefficients on the years of education variable vary between our division of workers and the rates found for the general definition of self-employed and employees in our sample.

4.2.2 Screening/Signalling Hypothesis and Returns

Similar to the Human Capital Theory, the Screening/Signalling hypothesis developed by Spence (1973) shows positive returns to education. Instead of impacting workers' productivity, education only plays the role of signalling productive ability in the labour market with incomplete information (Riley, 2001). By this reasoning, education provides additional information and helps employers identify suitable employees for specific jobs (Weiss, 1995). It serves as a credential which signals innate productivity, ability and motivation (Spence, 1973; Arrow, 1973). For this reason, the high levels of educational attainments for workers are associated with higher wages.

The theory also predicts that individuals who receive qualifications will earn more than individuals who receive the same number of years of education but without holding a degree (Silles, 2007). This is known as the sheepskin effect (meaning that credentials matter more than years of schooling). Nonetheless, the existence of the sheepskin effect should not necessarily be taken as in favour of the signalling hypothesis, as the estimates used in previous

econometrics have been limited due to lack of information and because of misinforming implications. This is caused by the complicated educational system between countries, especially in the case of the UK (Card and Krueger, 1992; Silles, 2007). Thus, the use of years of schooling to measure the sheepskin effect may lead to biased results on the true effect if individuals do not earn a degree and if others take a different amount of time to complete it.

Walker and Zhu (2003) did not find any validation of the signalling power in England and Wales, when analysing the effect of the rise in the school leaving age (RoSla) from 15 to 16 in 1973 using the Labour Force Survey (LFS). But Chevalier, Harmon, Walker and Zhu (2004), after rejecting the signalling theory, suggested that the "sheepskin" effects are important after controlling for years of education, using LFS data. This also supports earlier work by Chevalier and Walker (2002) using the BHPS and the General Household Survey (GHS) to estimate the returns to education for specific qualifications. They found that attaining GCSEs compared to no qualifications is associated with a 25 percent increase of wages, after controlling for years of education. An up-to date study by Dickson and Smith (2011), using data from the Quarterly Labour Force Survey for the years 1993 to 2000, found sizeable returns to academic qualifications when exploiting other institutional rules, e.g. the Easter Leaving Rule (determines exactly when in the school year people can leave school). The results of their analysis suggest that most returns to education are driven by qualifications, where 70 percent of the estimated returns are based on the RoSLA and the returns to academic qualifications increase the probability to employment by 40 percentage points.

Other studies for testing the signalling theory (e.g. Brown and Session (1999); Van der Sluis *et al*. (2008)) use the self-employed as control groups to test the relevance of the signalling theory because in their case no employer exists. These studies argue that the self-employed do not need any screening, since no information is needed for employers to hire them as they are their own boss. But this is not the case for paid workers, as their returns to education

include the sum of both effects; the human capital and the signalling effect. A downside to these studies is that the self-employed can use formal education as a signalling tool to screen their productivity and the levels and quality of their work for potential customers (Parker and Van Praag, 2006). Hence, the signalling theory does not provide clear predictions on the relative returns to human capital for employees and self-employed. Also, it reveals doubt on using the self-employed as control group to test the significance of this hypothesis.

In this study, we show that the differences between the sustained self-employed and the dabbled self-employed cannot be due to signalling against employers because in this respect these workers do not differ from each other. This also puts further doubt on using the self-employed as control group to test the screening hypothesis. However, we are interested in testing the presence of the sheepskin effect between our division of workers after controlling for years of education. This shows us if credentials matter more than years of education and how the levels of qualifications can be rewarded differently between workers and which group has the highest returns.

4.2.3 Personal Control Theory and Returns

The personal control theory predicts higher returns to human capital for entrepreneurs than wage earners. It claims that entrepreneurs have more autonomy, better control on the way they use their own human capital and are not constrained by other organisational rules and tasks (Benz and Frey, 2008; Van der Sluis and Van Praag, 2004, 2007; Douhan and Van Praag, 2009; Van Praag *et al*., 2009; Van Praag *et al*., 2013). This places them in a better position than employees when maximising their earnings.

Previous research examined the returns to education and the heterogeneity in returns for the formal wage sector but excluded self-employment due to data limitations and difficulties in measuring the self-employed income (Heckman *et al*., 2006; Veitch, 2007). Only recently have studies started to assess how the returns to education compare for entrepreneurs,

to consider the challenges in the empirical literature concerning the endogeneity of education and the self-selection problem into occupational choice (e.g. Fossen and Buttner (2013); Shane, (2006); Van der Sluis, Van Praag and Vijverberg (2008)).

The studies in the US tend to report higher returns to entrepreneurs than employees, 10 percent rate of returns in contrast to 7 percent (Evans and Jovanic, 1989; Evans and Leighton, 1989; Kawaguchi, 2003). The US discoveries were reconfirmed by the work of Van Praag, Van Witteloostujin and Van der Sluis (2013), and the work of Van der Sluis *et al.* (2013), while considering the endogeneity problem of education. Van Praag *et al.* (2009) also managed to indirectly support the personal control theory, while accounting for the endogeneity of education and self-selection, using the National Longitudinal Survey of Youth (1979-2000) for the US cohort. They showed higher returns to education for entrepreneurs, due to the benefit of having lower organisational constraints than paid workers. The indirect evidence is from the observations in cross-section studies (e.g. Blanchflower and Oswald (1998); Hundley (2001)). The panel studies (e.g. Taylor (1996); Benz and Frey (2008)), where it showed more satisfactory results for being entrepreneurs rather than employees, although the nature of the job requires working more hours, higher risk and more variation in the income earned. The direct evidence is attributed to more autonomy and control over their own work than wage earners (Benz and Frey, 2008).

In summary, these studies established higher returns to formal education for entrepreneurs than for paid workers, especially for male workers with most entrepreneurs being found as highly educated and more likely to run successful businesses that add great value to the economy (Van Praag and Van Stel, 2013; Maria Millán *et al.*, 2013). This was especially noticeable due to the increase in the proportion of self-employed between the years 2008 and 2012, attributed to the financial crisis, whereby Americans who lost their jobs were left with

no choice but to start up their own businesses (New York Times, US secretary of Labor, Robert Reich, 2010).

But, opposite results are found in Europe, where the returns to education for self-employed is lower than employees in Germany and Italy but are quite similar for the UK in Mainar and Gomez's (2011) work, using the European Community Household Panel (ECHP) data for the period 1994-2000. Hamilton (2000) reported in his study significantly lower returns for entrepreneurs than for employees. Also, the findings in Blanchflower and Shadforth's (2007) study using the LFS, Her Majesty's Revenue and Customs (HMRC) and various family resource surveys show that the median earnings for entrepreneurs are less than paid employees, with entrepreneurs more likely to be men, in the construction sector, in central London, working longer hours, but having higher levels of job satisfaction and happier.

The shares of entrepreneurs in the UK typically lag behind the US estimates, but still outperform other European countries like Germany (e.g. Rees and Shah (1986); Taylor (1996); Blanchflower and Shadforth (2007); Van der Sluis and Van Praag's (2007) study; Hart *et al*., (2015)). The GEM (2006) global report shows that 85 percent of entrepreneurs are driven by opportunity in the US, followed by 80 percent in the UK and 60 percent in Germany, whereas the Nordic countries are the highest; 90 percent (Bosma and Harding, 2007 p:15). Since 2012, there have been levels of improvement-driven opportunity motivated entrepreneurs, but still the percentages for the UK lie below the US; 43 percent versus 59 percent (Xavier *et al*., 2012 p:26).

The considerable higher returns for entrepreneurs in the US in comparison to other European countries like the UK can be attributed to the difference in ability of governments in preparing individuals for entrepreneurial activities (Van der Sluis *et al.*, 2008; Fossen and Buttner, 2013). Thereby, studies by Lazear (2004), and Doms *et al.* (2010) claim that the educational system in the US is more successful in teaching and training workers with the skills

to become entrepreneurs and adapting to different responsibilities. Whereas, the European educational system is more prompt in helping individuals to become more specialised in the wage employment sector rather than self-employment. On another note, Hamilton (2000) suggested that the non-pecuniary benefits are substantial for the self-employed even though they have lower initial earnings and earnings' growth than paid employees. Perhaps the lower earnings for the self-employed in UK are traded in for the non-pecuniary benefit of being their own boss.

Concerning the literature on the returns to work experience, studies on US data showed that the returns to experience are lower for the self-employed (Evans and Leighton, 1989; Shuetze, 2000; Williams, 2000-2001). Bruce and Shuetze (2004) obtained similar findings attributed to women and young business owners. As for the case for Germany, the returns to education and experience were found to be inconclusive, some results showed that the returns are lower for the self-employed (e.g. Williams (2002)) and others that are higher for this sector (e.g. Van Der Sluis *et al.*, 2007). A number of studies (e.g. Salop and Salop (1976); Lazear (1981); Lazear and Moore (1984); Dunn and Holt-Eaken (2000)) predicted a flatter earnings-experience profile for the self-employed, as wage earners earn higher wages than self-employed when they grow older. However, opposing results were found for the very few and successful entrepreneurs, called "the superstars" (Rosen 1981; Mainar and Gomez, 2011 p:83). In the case of the UK, the years of experience are clearly higher for the self-employed and the earnings' experience profile is found to be steeper than for the paid employees in the long run, showing the significance of their competitiveness in the labour market (Mainar and Gomez, 2011 p:92).

In summary, studies examining the magnitude of returns to education and experience for the self-employed and paid employees have been mixed and limited by numbers and the evidence in the UK is diverse and varied. The estimates of returns vary significantly, depending

on the data used, the assumption being made, with the empirical methodology used. Also, the results found do not offer any kind of comparison with other studies and only limited works have used data for more than a one year period. In this chapter, we use the self-employed as a proxy measure for entrepreneurs (like in Hamilton's (2000) study). We estimate the returns to education for the self-employed as whole and test for differences from the returns to paid employees. We also account for the endogeneity problem and self-selection bias into occupational choice.

4.2.4 Heterogeneity of self-employed and the returns to education

The main challenges in the literature in the returns to education is the endogeneity problem with the education variable due to unobserved heterogeneity and ability bias, along with the self-selection problem into the different labour market states (Ashenfelter, Harmon and Oosterbeek, 1999; Harmon, Oosterbeek and Walker, 2003, Shane, 2006; Dickson and Harmon, 2011). Additional problems arise when computing a single estimate of the rate of returns to a population as it does not take into consideration the heterogeneity between sub-populations (Henderson, Polacheck and Wang, 2011). This argument is especially relevant for the case of self-employed where self-employment compromises a wide range and types of employment activities.

The Global Entrepreneurship Monitor (GEM) distinguishes between two types of entrepreneurs; opportunity and necessity entrepreneurs, based on the different levels of control over the human capital and the different types of motivation towards work. Opportunity entrepreneurs pursue self-employment by their own will and are pulled to such an employment choice, perceiving it as a prospect to develop, to make the best use of their own skills and to earn more profits. Whereas, necessity entrepreneurs lack alternative employment options and are pushed to pursue this type of employment for their own survival (Reynolds *et al.*, 2002; Dawson and Henley, 2012; Sternberg *et al.*, 2006). Thus, by pooling these two types of self-

employed into one homogenous group of workers, the previous analysis conducted might show misleading results for policy makers and for prospect workers. And, the results might underestimate the value of education for opportunity entrepreneurs, at the same time providing false hopes for necessity entrepreneurs (Fossen and Buttner, 2013).

More advanced studies have extended the field of work on the returns to education for the self-employed and considered this heterogeneity (e.g. Fossen and Buttner (2013); Block and Wagner (2010) and Block and Sandner (2009); for the German household panel data).

Fossen and Buttner (2013) provided a validation to the extended personal control theory by looking at how earnings differ between necessity and opportunity entrepreneurs using the German Socio-economic Panel (SOEP) data. They followed their own general definition for the distinction between entrepreneurs and compared the result with Block and Wagner's (2010) own specific definitions for opportunity and necessity entrepreneurs. Fossen and Buttner (2013), used the registered unemployment history from the German Socio-Economic Panel (GSEP) data as a main criterion to classify entrepreneurs. The self-employed who were registered unemployed before entering self-employment were considered as necessity entrepreneurs, and the rest of self-employed were considered as opportunity entrepreneurs. This was considered the base of the general definition of opportunity and necessity entrepreneurs. The division procedure kept the data representative of the German population, along with controlling for workers accumulated years of prior unemployment to prevent the indication of necessity entrepreneurs to pick up on any potential effect of human capital differentiation over time (Arulampalam, 2008).

Their general definition was different from Block and Wagner's (2010) specific distinction. Where these latter refined the division criteria for the self-employed and limited the analysis to only workers who did not lose their wage employment for more than two years. Block and Wagner (2010) also considered the reasons behind why a former job has ended and

did not allow for more than two years' gap for the results to not reveal doubts on the reasons why a worker left their previous paid jobs. They excluded workers whose previous paid job contracts have expired and workers with consecutive self-employment spells, as it is hard to make any motivation judgment on the reasons behind why they become entrepreneurs. The results of their more refined restriction resulted in a very small sample size; only 1,529 self-employed were successfully identified compared to the 6,267 self-employed in Fossen and Buttner's (2013) general distinction.

Block and Wagner (2010) found the returns to be only 4.3 percent for opportunity entrepreneurs and not statistically significant from zero for necessity entrepreneurs, using random effect model and Generalised Least Squares estimates. However, these estimates are potentially biased because they did not take into account the endogeneity problem of education.

In terms of length in self-employment, Block and Sandner (2009) found that necessity entrepreneurs spend shorter periods in self-employment than opportunity entrepreneurs (less by 1.1 years). Plus, on average necessity entrepreneurs have fewer years of education than opportunity entrepreneurs but still higher than paid employees (Wagner, 2005).

Fossen and Buttner's (2013) results showed that necessity entrepreneurs had lower returns to education than opportunity entrepreneurs and wage earners by 3 percentage point, thus demonstrating less control and use of their own human capital because they did not choose to become entrepreneurs voluntarily. However, the personal control theory was not fully validated, after controlling for the self-selection bias into the different states of employment and taking into consideration the endogeneity problem of education. As a result, opportunity entrepreneurs did not enjoy any higher returns and had similar rate of returns to paid employees of 8.8 percent. Their analysis did not validate the screening hypothesis, by pointing out that the difference in the rate returns to education between opportunity and necessity entrepreneurs

cannot be due to signalling causes. But, their results revealed higher impact for opportunity entrepreneurs than Block and Wagner's (2010) findings.

It is worth noting that most of the work on the returns to opportunity and necessity entrepreneurs are based on German and US data and the current literature lacks reports on the UK. Germany's entrepreneurial activity is much lower than the US and the UK (5.6 percent for Germany, 7.3 percent for UK and 12.3 percent for US) (Global Entrepreneurship Monitor, Kelly *et al.*, 2011). Also, the evidence on the returns to entrepreneurs tend to be inconclusive and dependent on the methodology used (e.g. Williams (2003) for the case of Germany), and the results do not offer direct comparison with other countries (e.g. Parker and Van Praag (2006) for the case of Netherlands).

Unlike the GEM data, the BHPS and UKHLS do not provide us with this subjective information on how to classify entrepreneurs into necessity and opportunity entrepreneurs. Thus, distinct from Fossen and Buttner's (2013) and Block and Wagner's (2010) divisions between entrepreneurs, we follow different criteria to separate the self-employed workers in our sample. We rely on objective information and observations from recent labour market history to classify our group of workers. We look at the transitions of respondents over labour market status over time and the time spent in each employment type. We identify those who switch between self-employment and paid employment as dabbled self-employed, those who are observed most their employment time in self-employment as sustained self-employed and workers who are fully committed to paid employment during their total observed employment time as paid employees. We also restrict our workers with respect to the number of times they are observed in unemployment and inactivity (please refer to chapter 3 of this thesis for more detailed information about the exclusions, the rationale behind this distinction and how the division has been constructed). Our sample size consists of 1,146 sustained self-employed, 1,149 dabbled self-employed and 9,362 always employees. We estimate the returns to

education for our division of workers and directly compare how the estimates vary, whilst accounting for the endogeneity of education and the non-random self-selection.

4.2.5 Hypotheses for Dabbled and Sustained Self-employed

We derive our hypotheses about the returns to education for the sustained and dabbled self-employed based on the extension of the personal control theory, which originally looks at the differences in returns between entrepreneurs in general and paid workers (Douhan and Van Praag, 2009). The theory argues that entrepreneurs should enjoy higher returns than paid workers because they have better control and use of their own human capital and are not bound by business rules nor constraints. We also relate our research with Fossen and Buttner's (2013) and Block and Wagner's (2010) work on the extended version of the personal control theory, looking at how the returns differ between necessity and opportunity entrepreneurs and applying similar reasoning for our dabbled and sustained self-employed.

The enhanced personal control theory argues that opportunity entrepreneurs should enjoy higher returns than wage earners because of their own and better personal control over their employment status, and human capital. Because they have spotted specific business opportunities compatible with their own human capital and planned beforehand to engage in such work to make the best use of their own human capital/formal education and skills. On the other hand, necessity entrepreneurs would not be entrepreneurs if they had other alternative job options. They are pushed into entrepreneurship out of necessity and consider self-employment as a last resort; either because they were previously unemployed, as the general definition of Fossen and Buttner (2013) suggests or because they were laid off from previous paid employment, as Block and Wagner (2010) emphasise in their specific definition. Therefore, they do not have any planning advantage to develop any business idea or to make use of their own skills to the optimal point, and do not have full control over their own use of human capital, where they cannot exploit the benefits of the personal control theory. As a result, they have

lower returns to human capital than paid employees and opportunity entrepreneurs, and their opportunity costs are the unemployment transfer payments rather than the forgone earnings from wage employment (because this option was not a viable for necessity entrepreneurs to engage in).

Following a similar reasoning to the extended version of the personal control theory, we argue that because dabblers do not maintain for a longer period than sustainers in self-employment, hence they do not have sufficient time to develop any business ideas nor use their own skills efficiently. They are more likely to have lower returns to human capital than the sustained self-employed and are not able to enjoy higher returns than paid employees, because they are incapable of securing or ensuring for long in paid employment too. The lower returns to formal education might be explained by their oscillating pattern between these two different labour market states and might relate them to necessity entrepreneurs, who might be forced to engage in self-employment due to market conditions, and would have preferred paid jobs instead, if this option was viable.

Whereas, the sustained self-employed have more planning advantages than the dabbled self-employed because they continue longer in self-employment. The lengthier time spent in self-employment allows us to consider them to be more established, have better social connections, and more planning advantages. Their stability and persistence in this type of employment permit them to enjoy higher returns to their own human capital than dabblers and in a way to resemble opportunity entrepreneurs. We also expect them to have higher returns than the always employees because they are not bound by business rules, since they are their own boss and have more control over their work and better use of their personal human capital.

A further possible hypothesis is that the differing characteristics between dabblers, sustainers and always employees takes us to a different argument, whereby dabblers might be 'trying-out' both types of employment to see what best suits their skills and preferences. But

their agile way of working does not help us truly capture the effect of education on their earnings. Thus, the limitation of our study is that it does not allow us to observe this dynamic element and look at extent to which the various 'types' change. For that reason, we restrain from testing this hypothesis and only focus on the arguments mentioned above. To some extent we tackle this issue in the following chapter by looking at how the recession impacted differently our group of workers, and how dabblers have changed their form of work (from paid employment to self-employment, or vice versa) prior to and after the economic downturn. Thus, we hypothesise that:

1. Hypothesis 1: Sustained self-employed have higher returns to human capital than wage earners.
2. Hypothesis 2: Sustained self-employed have higher returns to human capital than dabbled self-employed.
3. Hypothesis 3: Dabbled self-employed have lower returns than wage earners.

4.3 Econometric Approach and Data

4.3.1 Data

4.3.1.1 BHPS and UKHLS

We use the same dataset as in previous chapters, the British Household Panel Survey, and its successor the United Kingdom Longitudinal Study. Both are representative of the UK population, observing respondents from years 1991 to 2014. The advantage of using panel data is the increase of precision in estimation (Cameron and Trivedi, 2009). We prefer using this dataset to other data sources; like the GEM because it provides us with more detailed socio-economic information, especially with respect to employment history, education and income. Thus, these datasets are one of the main instruments to measure social changes in Britain and are considered as national representative of the population by interviewing over 5,500 households and 10,000 individuals each year. They provide unique national information for

policy makers and the academic community and have been used and tested for plausibility in labour economy and other field of studies (Marè, 2006).

The unbalanced data allows us to take into consideration several business cycles and permits researchers to collect extensive information about respondents' work-life histories. These histories are supplemented annually by further spells of information and details of activity and inactivity during the date of the interview. Unfortunately, respondents do not always provide consistent information regarding their employment histories. Therefore, there are conceptual challenges in constructing consistent work histories from the BHPS and the UKHLS (Halpin, 2000; Marè, 2006).

Consistent histories require sequences of spells' start and end dates that generate consecutive non-overlapping spells accounting for respondent's entire history after leaving full time education. But there are difficulties in obtaining a sequence of such data, as date information may be partially or totally missing. Also, dates might be still present but can generate inconsistent histories due to negative durations, overlapping spells and gaps between spells (Marè, 2006 p:18). There are other alternative data sources to the BHPS for the spells count, like the Joint Unemployment and Vacancy Operating that produce the claimant count (JUVOS) and the LFS. Although these surveys are administrative sources, they lack information on individual characteristics, whereas our study is particularly sensitive to unobserved differences in individual characteristics. Thus, the BHPS and the UKHLS are the preferred data source for this study. Conversely, they are not administrative in nature, as all information collected is based on self-reporting and the labour market definitions based in them are not consistent with that of the International Labour Organisation (ILO).

Our objective in this thesis is to create a consistent Working-life history of respondents by combining all file histories from different subsets in the available information from the two merged datasets. However, the datasets created differ in detail in which spells are identified

and include negative duration values, overlaps and gaps. There are some cases where respondents' work-life histories involve overlapping spells, especially when workers have a second job. Also, the histories were recorded with errors creating some overlaps and gaps that do not exist. Some other difficulties we faced in deriving a consistent work-life history arise from the difference in the sorts of spells during which information are collected. Nevertheless, the reports are not always consistent because spells must agree on timing and type of activity, and when merged between the two-panel datasets, seam effects are created, leading to shorter spells and creating more transitions than what it occurs in workers' life histories. This is the case when we tried to merge the spells from the BHPS dataset (years 1991 till 2008) with the UKHLS dataset for the continuing BHPS members (years 2010 till 2014).

The results found are more likely to cause biases in the analysis of durations and transitions and possibly overestimating the returns to tenure (Paul, 2002). This caused us concerns when adapting a similar approach to Halpin's (2000) and Marè's (2006) methods. Another limitation in our approach is the dataset itself for the continuing BHPS members in the UKHLS. There is a low number of response rates for the continuing members on the spells start and end dates and their duration. Thus, achieving internal consistency will be at the expense of losing more information provided by our respondents. As a result, we shifted from Halpin's (2000) and Marè's (2006) approach and relied only on the available information for us from the yearly reported employment status during the period of investigation (from years 1991 till 2014, with year 2009 missing).

Another drawback when using survey data is the problem of missing data which is a long-standing problem that arises from non-responses, or partial responses to survey questions (Cameron and Trivedi, 2005). These gaps are results from non-responses and attritions from panels that happen frequently. In microeconometrics the standard and simplest approach to deal with missing values is to drop the observations and only analyse the reduced sample of

complete information. This might lead to less precise estimates and inference, as throwing away data means throwing away information and reducing efficiency in the estimation. Also, it can cause sample-selection bias in the regression especially when the retained observations are no longer representative value of the dependent variable in the regression (Cameron and Trivedi, 2010 p:46). Alternative to dropping missing observations is to impute these missing values, but these imputation methods have limitations. They might impact the marginal distribution of the data, distort the covariances and correlation between variables and provide conventionally estimated standard errors and biased tests statistics (Cameron and Trivedi, 2005 p:929). Thus, in our analysis we follow the norm of microeconometric studies and use only the original data available for us to work with (Cameron and Trivedi, 2010 p:47).

4.3.1.2 Earnings Variable

The earnings' regression in the analysis includes the reported earnings by paid workers and self-employed respondents of age 16 and above. Recalled from the prior chapter, the self-employed are workers who report self-employment as their primary working activity, Likewise for wage earners. Main job is defined as the job with the most hours worked, in the case that hours are equal between two or more jobs, the main job is the job with the highest pay.

The dependent variable is the log hourly gross pay. The BHPS and UKHLS question paid workers for their employment income before tax and national insurance contribution in the month prior to the interview. The self-employed workers are explicitly asked for their monthly net profit before tax, and their average income from the job. Net profit is the difference between revenues received from job and expenses encountered for the job. It is considered the standard measure for self-employed income. A drawback to this measure is that figures reported tend to be under-reported due to tax consideration (Hamilton, 2000; Levitt and Dubner, 2006, Feldman and Slemrod, 2007; Hurst *et al.*, 2010). Therefore, we cannot rule out the possibility that our group of self-employed workers might have understated their profits in

the surveys. This is one of the most popular claims in the literature, where self-employed earnings' measure suffers from imprecision because it is only based on net profit. However, the under-reporting is not a problem and the partial effect of education on earnings can still be identified if the extent of under-reporting is not systematically related to education (Van Praag *et al.,* 2009 p:26; Fossen and Buttner, 2013 p:71).

It is assumed that profit is a direct and unambiguous function of work effort, but sometimes "it becomes an uncertain function of work efforts when it is affected by varying possible outcomes like; changes in customers' preference, prices of competitors, availability of products, macroeconomic variables and so on (Douglas and Shepherd, 2000). Hence this what makes "self-employment a more riskier endeavour than paid employment (where employees typically receive salaries that may or may not be supplemented by commissions or bonuses)" (Le'vesque *et al*., 2002 p:195). For this reason, the empirical literature suggests that the variance of earnings for self-employed is three times larger than that for wage workers (Rees and Shah, 1986).

Another issue is the problem with the binary divide in employment, where the distinction between self-employment and employment is becoming harder to maintain. The data from the HM Revenue and Customs suggests that more than 5.5 million workers report income from self-employment, with one-third of them also reporting income from paid employment (Mian, 2016 p:1). Thus, there is a strong need to improve people's understanding of their employment status, as firms are hesitant in helping the self-employed to understand their rights and entitlements, because this might affect the employer and employee relationship (Nevin, 2017).

In this chapter, we attempt to make the earnings variable for self-employed workers more compatible with the earnings for paid employees and increase the number of observations by combining the self-employed profits with the reported average self-employed monthly

earnings from the business and standardise the combined pay variable for this group of workers. All pay variables are deflated using the year 2000 as base year and transformed to real pay by the following equations:

$$\text{paydeflator} = \frac{(\text{nominalpay})}{(\text{realpay})}. (4.1)$$

Here:

- $\text{nominalpay} = (\text{incomeinyeart} \times \text{hoursworkedinyeart})$. It is the yearly pay, but not adjusted for inflation.
- $\text{realpay} = (\text{incomeinbaseyearT} \times \text{hoursworkedinyeart})$. It is the yearly income after taking into consideration the effect of inflation.

With T equal to year 2000 and identified as base year, and t are the observed years in the study, from years 1991 till 2014 with missing year 2009.

Hence, real income is computed by the following equation:

$$\text{realincome} = (\text{nominalpay} \times \text{paydeflator}). (4.2)$$

Then, income is converted to hourly deflated pay by the following equation:

$$\text{hourpay} = \frac{\text{monthlypay}}{(52/12) * (\text{hoursworkedperweek} + 1.5 \times \text{overtimehours})}. (4.3)$$

Here:

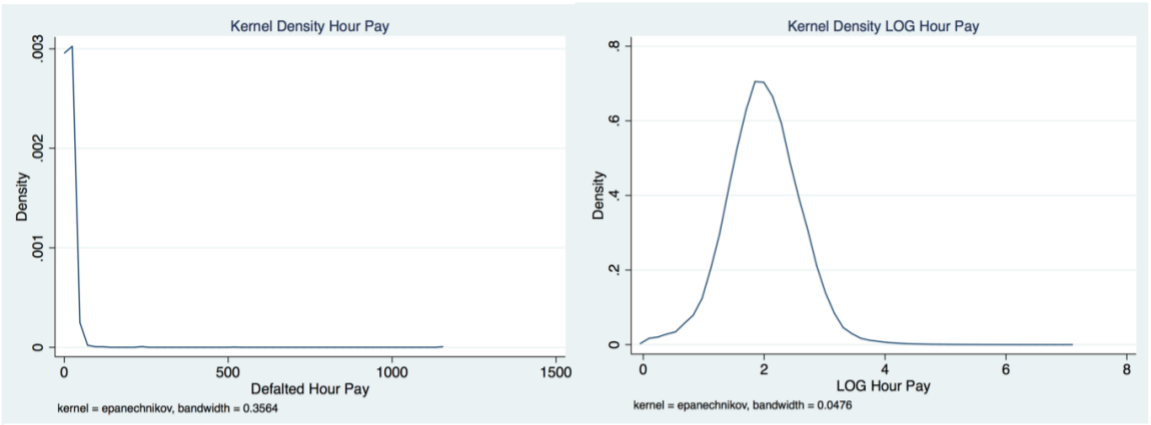
- "52" is the number of weeks per year.
- "12" is the number of months per year.

And "1.5 is the compensation of overtime hours worked more than the 40 hours normally worked per week on a full- time work basis for paid worker" (this is not the case for self-employed workers as they do not have any overtime hours to report and are not restricted by firms' rules and regulations).

Figure 4.3 below shows the kernel density diagram for the imputed combined pay variable for both paid employees and self-employed. The below figure suggests that the hour pay variable

is skewed (the median 7.245395< mean 8.885344 and Skewness 29.60627> 0), and with thick tails (kurtoses 2506.439>3). This suggests that the model has multiplicative instead of additive errors. And the standard solution is to transform the dependent variable into natural logarithm (Cameron and Trivedi, 2010 p:76).

Figure 4.3: Hour Pay and LOG Hour Pay



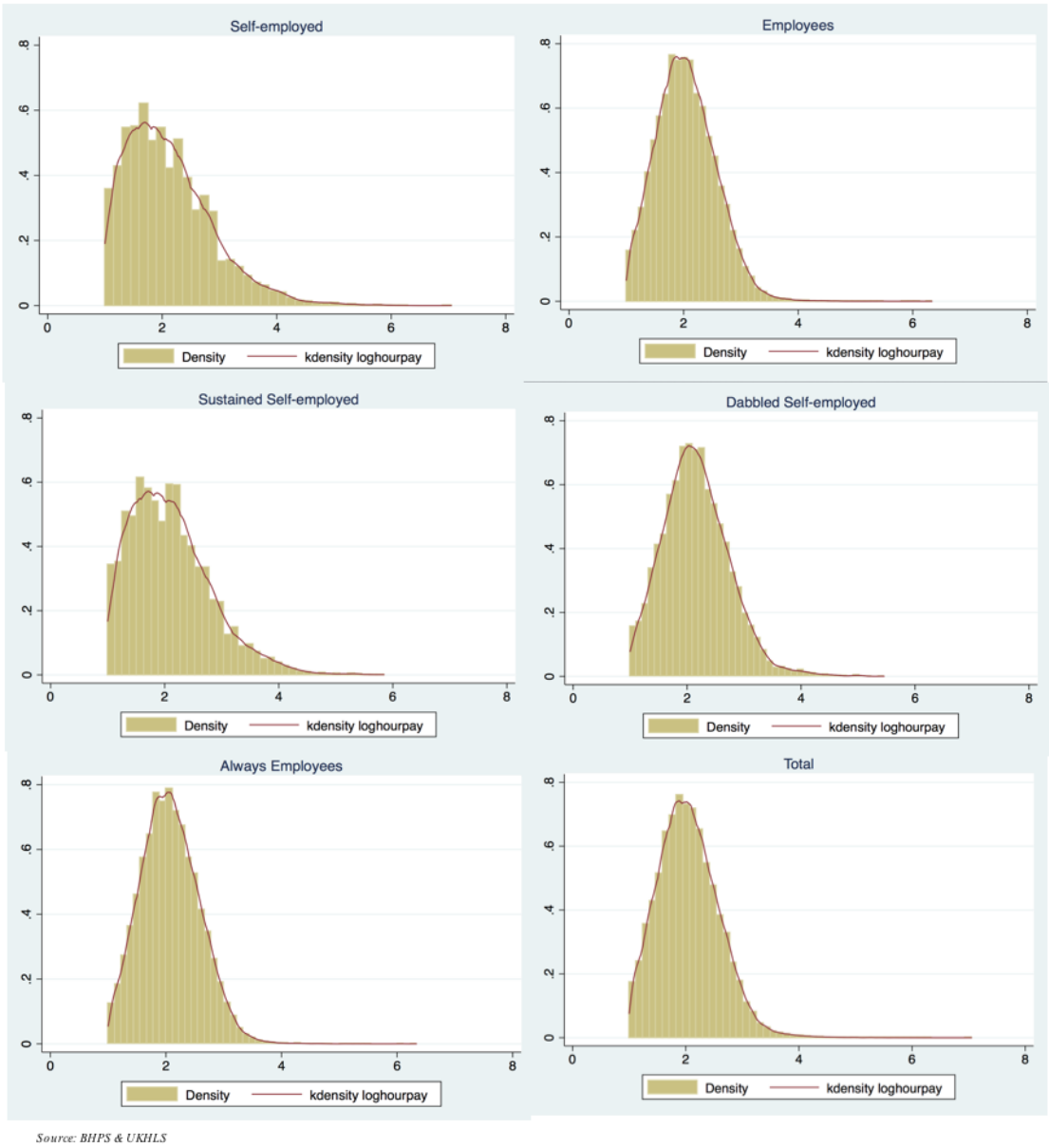
variable	N	mean	p50	sd	skewness	kurtosis
hourpay	135272	8.885344	7.245392	8.952561	29.60627	2506.439
loghourpay	135272	1.987959	1.980366	.6028109	.1384023	4.104103

Source: BHPS & UKHLS

Figure 4.4 compares the histogram and density for the log earnings between the combined and general group of self-employed and paid employees and our divisions of workers. The diagram shows that the self-employed as whole group and the sustained self-employed have a right skewed distribution for the pay variable with thick tails. This shows the volatility and the dispersion of the earnings variable for the self-employed, where the greater dispersion reflects more heterogeneity in this nature of employment due to different types of activities, from low ability workers to professionals. We notice that the employees in the general definition, along with the dabbled self-employed and the always employees have a similar normal distribution. This is a bit surprising, as we would expect the pay of the dabbled self-employed to be the mostly skewed and unevenly distributed out of three types of workers because of the volatility

of their working conditions and their oscillating pattern in comparison to the sustained self-employed and always employees.

Figure 4.4: Histogram and density for LOG Hour Pay



Source: BHPS & UKHLS

4.3.1.3 Education Variable

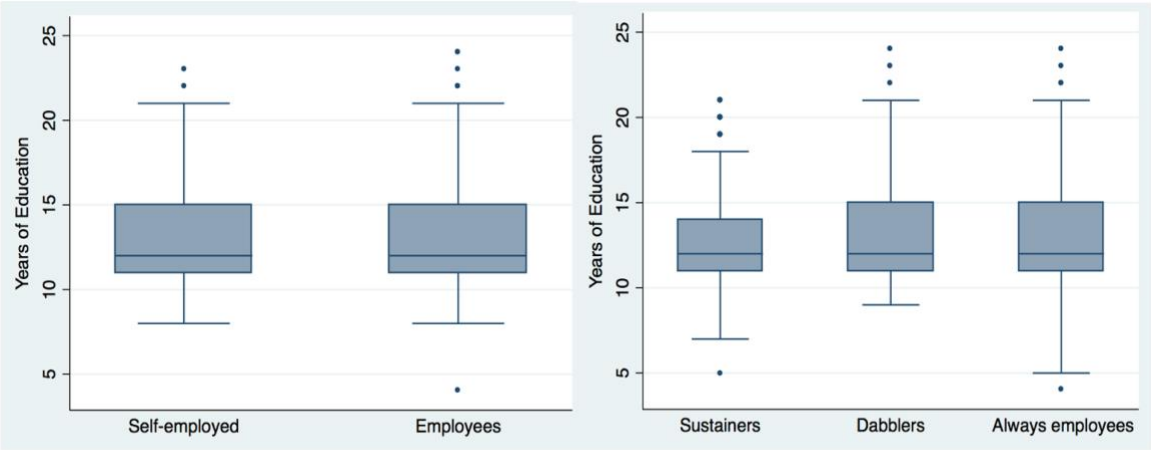
Education is the key explanatory variable in this chapter and is measured into years of schooling. It is equal to the number of years during which respondents start and finish schooling and/or further education (age started schooling minus age ended schooling and/or further education). Along with this, the prior labour market experience is computed and noted as the

potential experience; equal to respondents' age minus years of schooling and minus five years. These two variables account for the Human Capital accumulation for our workers.

We control for the human capital acquired and the human capital depreciation by restricting the numbers of times our division of workers are observed in either unemployment or inactivity. We further account in our analysis some key characteristics (described in the previous chapter) and examine their effect in the earning regression (like: age, gender, ethnicity, origin, marital status, partner working, presence of children and responsibility for children under the age of 16, any disability, English first language, fathers and mothers are previously paid workers or self-employed, total monthly income of the household and the total number of hours worked per week).

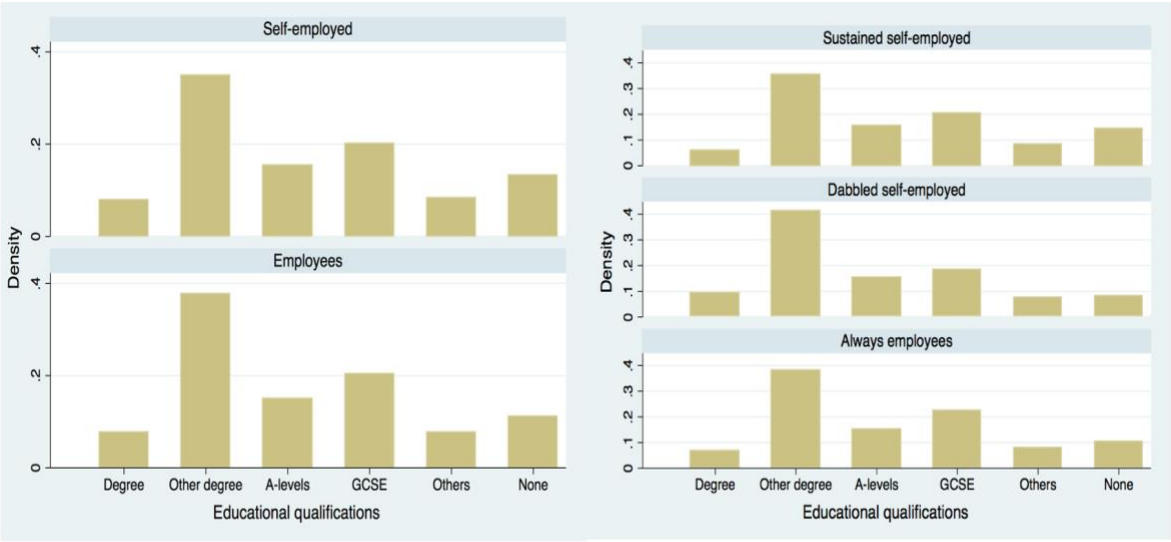
Figure 4.5 below visually presents the BoxCox demonstration for years of education and figure 4.6 presents the histogram distribution of the highest attained educational qualifications between our group of workers.

Figure 4.5: BoxCox Years of Education



Source: BHPS & UKHLS

Figure 4.6: Educational Qualifications Histogram



Source: BHPS & UKHLS

The BoxCox illustrations in figure 4.5 shows that the self-employed in general have similar years of education like paid employees. As for the case of dabbled self-employed, they have the highest computed years of education, followed by the always employees and lastly by the sustained self-employed. Similar findings were also shown in the histogram diagram in figure 4.6 using educational qualifications instead of years of education. The dabbled self-employed have the highest density for degree attainment (higher degree and other degree) followed by the always employees and lastly by the sustained self-employed. They also have the lowest density among those who do not hold any qualifications. The always employees report the highest density in GCSE achievements. Similarly, the sustained self-employed presents the same findings but report higher density in not having any qualification than the other two groups of workers. Worth to note that these observations were not noticeable when comparing between the two homogenous groups of self-employed and paid workers. Hence our division shows more variability in the data presented, with respect to educational attainments than the combined group of self-employed and paid workers.

4.3.2 Characteristics of Workers

Table 4.1 provides the summary statistics for the control variables used in the analysis with respect to the general definition of self-employed and paid workers. These two groups are treated as homogenous in their nature, and do not include any restrictions on the number of unemployment and inactivity spells, nor for the time seen in the sample. The sample consists of 15,285 employees and 2,601 self-employed workers. Table 4.2 shows how the statistics vary, using our restrictive sample that forms our divisions of workers; the dabbled self-employed (1,149), the sustained self-employed (1,146) and the always paid employees (9,362 individuals).

4.3.2.1 Gross Hourly Pay

In table 4.1, the self-employed exhibit a higher mean of gross hourly pay compared to paid employees (£9.966 vs £8.252 per hour). This is similar in table 4.2 for both subgroups of self-employed, with the highest mean of gross hourly pay for the dabbled self-employed (£9.630 per hour, followed by £9.432 for the sustained self-employed and £8.492 for the always employees). The t-test to the right-hand side of table 4.1 reveal that the differences in earnings between the general definition of self-employed and paid workers are significantly different at 1 percent significance level. Similarly, the t-tests in table 4.2 reveal the same results between the sustained self-employed and always employees, and between the dabbled self-employed and always employees at 1 percent significance level, but only at 10 percent significance level between the sustained and the dabbled self-employed (t-test equal to 0.057). The variance of the hourly pay is greater for the general group of self-employed and for both subgroups of self-employed workers than for employees. This reflects the greater risk associated within self-employment and is confirmed by the higher reported standard deviation for the self-employed in general (17.438 versus 6.313 for paid employees) and for the sustained self-employed (13.530 versus 8.573 for dabblers and 6.238 for the always employees). Also, this was

previously shown in the distribution of earnings in figure 4.4, where the self-employed in general and the sustained self-employed have a more rightly skewed distribution and thicker tails. However, the dabbled self-employed do not seem to suffer much from this high variation and are somehow like paid workers in their log earnings distribution. To further validate our results, we tested the difference in earnings distributions between groups (the general group of self-employed and paid employees, sustainers and dabblers, sustainers and always employees, and dabblers and always employees), using the Two-sample Wilcoxon rank-sum (Mann-Whitney) test. The results of the test between all groups in table 1 in appendix B of this thesis, reveal that the distributions of earnings among our group of workers are significantly different (prob > |z| = 0.000 between all groups).

4.3.2.2 Hours of work

The self-employed in general works on average more hours per week than paid workers (43.956 hours versus 37.903 hours). This is also reflected in table 4.2 for both subgroups of self-employed workers with sustained self-employed on average working more hours than dabbled self-employed (46.512 compared to 42.160 hours) and dabblers working more hours than wage earners (39.231 average hours per week for the always employees). All differences are statistically significant. Hence, the longer hours worked by the self-employed in general and in both subgroups of workers may partly be explained by the self-insurance against their higher income risk (Parker, Belghitar and Barmby, 2005). Figure 4.7 also presents similar findings in an Hbar format.

4.3.2.3 Gender

The share of female among the self-employed is much lower than paid workers (24.1 percent compared to 51.4 percent). The percentages vary between the sustained self-employed and the dabbled self-employed, but are still below the always employees, and all statistically significant at 1 percent significance level, as we have seen in the previous chapter. Perhaps, the gender

penalty is still persistent in self-employment where we are more likely to observe men in self-employment as opposed to women.

4.3.2.4 Marriage, Spouse employment and Household Take-home Income

The percentages of married respondents are higher for the general group of self-employed (82.3 percent) than paid workers (74.8 percent). This also applies for our division workers, firstly for the sustained self-employed (81.5 percent are married or living with partner), followed by the dabbled self-employed (79.5 percent) and lastly by the always paid employees (74.7 percent). The dabbled self-employed have the highest percentage for working partner (65.8 percent), followed by the always employees (64.8 percent) and then by the sustained self-employed (61.8 percent) (the percentages are different from the previous empirical chapter, because we removed the missing values in each variable). This might also explain why the dabbled self-employed report on average the highest monthly take home income for their own household (£3148.637 for dabblers, compared to £3091.039 for sustainers, and lastly £2929.602 for the always employees). Considerably, we might argue that the additional household income might provide a safety net to dabbling workers and might encourage their oscillating and riskier pattern. As for the combined/general group of self-employed in table 4.1, a lower percentage is depicted for self-employed with working partners (61 percent compared to 63 percent for paid workers). However, they report higher monthly take home income for their own households than paid workers (£2983.460 vs £2894.503 per month), but with much higher standard deviations.

4.3.2.5 Years of Education and Work Experience

Moving to the variable on the years of education, the dabbled self-employed report the highest mean for years of education between our division of workers (13.145 years for the dabbled self-employed compared to 12.884 years for the always employees and 12.879 years for the

sustained self-employed). This is also the case for our general group of self-employed, (12.721 years of education for the self-employed versus 12.695 years for the paid workers).

A similar scenario is found for the work experience variable but at a much higher volume, where the self-employed in general have a higher mean of gained work experience compared to paid employees (27.123 years compared to 22.378) and are on average older than employees (44.844 vs 40.073 years). This was only noticeable for the sustained self-employed, who are on average older (43.607 years) and have higher number of years of work experience (25.728 years). Whereas, we find that our groups of dabblers and always employees are on average in the same age category and have similar years of work experience (dabblers are on average 38.636 years old with 20.491 years of experience, and the always employees are on average 38.420 old with 20.536 years of experience, but the age difference between these two is insignificant).

The statistics shown fit well with our division's reasoning, where the sustained self-employed spend more time in self-employment than dabblers and are older. Therefore, it is reasonable to assume that on average they have more years of experience, and that dabblers have the lowest mean of years of experience, because of their oscillating pattern, where perhaps they might simply be the younger version of sustainers.

4.3.2.6 Inactivity and/or Unemployment Spells

We already controlled for the unemployment and inactivity experience for our division of workers and restricted to maximum 2 spells for workers, but we still included the statistics for this variable to find out which group cycles more in the unemployed/inactive state. This is shown in table 4.2 for our division and in table 4.1 for our general group of paid workers and self-employed. The percentages in table 4.1 indicate, that the wage earners are more seen in unemployment or in inactivity than the self-employed (32.7 percent compared to 28.6 percent), and the difference is statistically significant (equal to 0.006). As for our division of workers,

the statistics shows that dabblers are the highest in percentages to be cycling in the unemployment/inactivity states (55.2 percent of dabblers), followed by the always employees (40.04 percent of always employees) and the lowest for sustainers (30.01 percent of sustainers), and the differences between all three groups are statically significant (equal to 0.000).

4.3.2.7 Full time work and Second Jobs

When asked, 82.6 percent of self-employed report self-employment to be their full-time activity, and 78.9 percent of paid workers report this for paid employment status. Smaller percentage of self-employed workers (9.6 percent) report to have second paid job compared to higher values for paid workers with additional paid jobs (27.8 percent) in table 4.1. The percentages entail similar landing for our two subgroups of self-employed workers in table 4.2 (with 88.2 percent of sustained self-employed employed full-time, followed by 86.2 percent for the dabbled self-employed and lastly by 83.8 percent for full-time always employees). Like expected, the dabbled self-employed report the highest percentage for working in second paid jobs in our division (12.9 percent for dabblers compared to 10.8 percent for sustainers and 7.9 percent for always employees), with all differences statistically significant at 99 percent confidence level. Hence, we can link the dabbling pattern to the notion of hybrid entrepreneurs who are able to combine between self-employment and paid employment. The above indications show that there is a high proportion of the UK workforce with dual jobs. This is in line with the ONS (2017) statistics, reporting more than 1.2 million workers with second jobs in the UK.

4.3.2.8 Start own Work

We included additional control variables in our summary statistics tables, on whether respondents would like to start their own work. As predicted the self-employed in general report higher percentages than employees for wanting to start their own work. The results are evident because they already started their business. This is also the case for our two subgroups

of self-employed, with dabblers reporting higher percentages for wanting to start their own work, followed by sustainers and lastly by the always employees.

4.3.2.9 Correlation

Table 4.3 shows the Pearson correlation table for the control variables used in our analysis and table 4.4 reports their VIF values. All variables are significantly correlated, but there is no sign of multicollinearity between the explanatory variable as the total VIF value is less than 10 (equal to 1.57). Worth noting that the potential experience variable is omitted in the VIF tables because of multicollinearity. Hence, we restrain from using this variable in our analysis and use age as a proxy for work experience.

There is also high positive correlation between the marriage/cohabiting variable and if the spouse or partner is working (73.93 percent, significant at 95 percent confidence level). This is also the case when respondents are responsible for a dependent child under the age of 16 and if respondent has children (73.71 percent at 5 percent significance level). The high association between these variables are totally explainable, as respondents need to be cohabiting or married to report if partner is employed or not. Similarly, Respondents can only report they are responsible for a dependent child if they report to have children.

There is a positive and significant association between years of education and the hourly pay variable (23.9 percent at 95 percent confidence interval). This is also graphically presented by the local polynomial regression histogram in figure 4.8, where the hourly pay variable rises with the years of education up to its highest peak attained at 18 years of education for all workers, followed by a steep decline and then catches back for few workers with an overall 22 years of education.

There is a very high diminishing rate for the general group of employees and the always employees when years of education variable is lower than 10 years, as most paid jobs require workers to finish their primary and secondary degree for them to be able to work. We notice a

continuous rise in the log hour pay for sustainers with years of education up to 20 years of education, whereas for dabblers the pay drops after 18 years of education and increases back for very few workers with more than 22 years of education. Likewise, a similar pattern is observed for the paid workers and the always employees.

The hourly pay variable increases with age by 10.96 percent. This is significant at 95 percent confidence level (in table 4.3) but rises at a diminishing rate for all our group of workers. This pattern is observed in the scatter plot for all workers in figure 4.9. where the pay gradually decreases after the age of 60 for the general group of paid workers and the always employees, as it might be due to workers reaching the age of retirement and the issue of differential retirement according to education/pay levels. It may be the case that hourly pay declines after the age of 60, as from this age and onwards the only people observed are low educated/low paid and so it looks like pay declines after 60, when actually this is an artefact of sample selection. Whereas, we do not observe this pattern for the general and both subgroups of self-employed, perhaps there is no age penalty present in self-employed as they tend to continue working later beyond the age of 60, and so we get a different sample as compared with paid workers.

Negative association is reported in the correlation table between age and years of education by 29.74 percent and significant at 5 percent significance level. This is in line with the human capital accumulation that diminishes with ages because the most important skills are taught during early years of schooling.

Figure 4.10 shows the scatter plots between years of education and age for workers in the sample. As shown for all respondents, most workers report their years of education between the age of 20 and 60. For the combined group of self-employed, most values are recorded between 10 to 15 years of education, from 10 to 17 years for the sustained self-employed, and from 10 to 19 years for the dabbled self-employed. As for the general group of paid workers

the values mostly recoded are between 10 to 19 years of education, whereas for the more specific group of always employees the most recorded values are within a higher band, from 10 to 20 years of education.

Table 4.1: *Employees and Self-employed Descriptive Statistics*

	Employees		Self-employed		t-tests of equal means
	Mean	Sd dv.	Mean	Sd dv.	self-employed vs employees p-val.
Gross hourly pay	8.252	6.313	9.966	17.438	0.000
Years of Education	12.695	2.684	12.721	2.836	0.000
Work experience	22.378	12.269	27.123	11.871	0.000
Unemployment and Inactivity experience	0.327	3.495	0.286	0.853	0.006
Full time	0.789		0.826		0.000
Second job	0.278		0.096		0.000
Age	40.073	11.738	44.844	11.394	0.000
female	0.514		0.241		0.000
married/cohabitting	0.748		0.823		0.000
partner working	0.630		0.610		0.000
has child	0.389		0.411		0.000
child below 16	0.207		0.112		0.000
disable	0.047		0.039		0.000
Non-UK native	0.047		0.062		0.000
non-white	0.025		0.029		0.000
English language	0.847		0.831		0.000
father self-employed	0.135		0.248		0.000
mother self-employed	0.038		0.072		0.000
other household income	2894.503	1684.414	2983.460	2575.403	0.000
employs workers	0.000		0.305		0.000
hours worked per week	37.903	13.180	43.956	17.645	0.000
start own business	0.083		0.096		0.002
give up paid work	0.203		0.122		0.000
person-year observation	96,494		10,556		
number of workers	15,285		2,601		

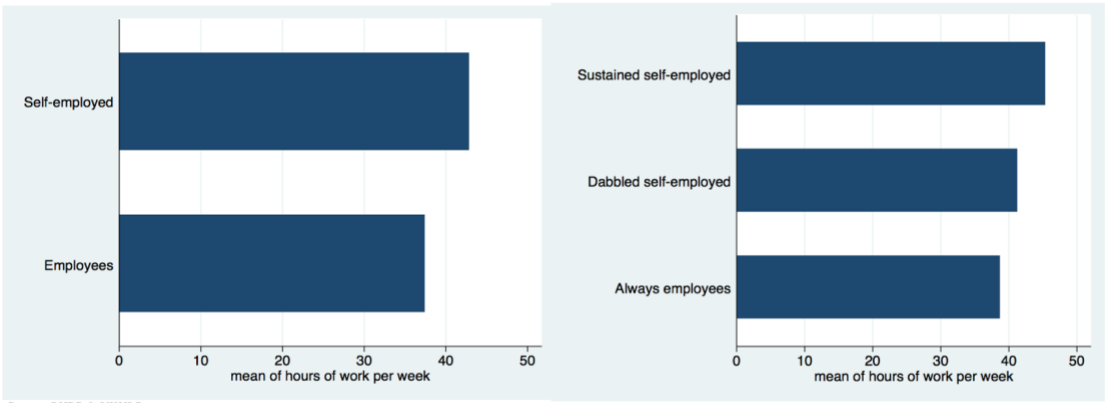
Source: BHPS & UKHLS

Table 4.2: *Division1 Descriptive Statistics*

	Sustainers		Dabblers		Always employees		t-tests of equal means		
	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.	Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Gross hourly pay	9.432	13.530	9.630	8.573	8.492	6.238	0.057	0.000	0.000
Years of Education	12.879	2.831	13.145	2.802	12.884	2.694	0.000	0.000	0.000
Work experience	25.728	11.240	20.491	10.307	20.536	11.293	0.000	0.000	0.000
Unemployment and Inactivity experience	0.301	0.610	0.552	0.748	0.404	0.671	0.000	0.000	0.000
Full time	0.882		0.862		0.838		0.000	0.000	0.000
Second job	0.108		0.129		0.079		0.000	0.000	0.000
Age	43.607	10.901	38.636	10.058	38.420	10.777	0.000	0.000	0.000
female	0.192		0.316		0.490		0.000	0.000	0.000
married/cohabitting	0.815		0.795		0.747		0.000	0.000	0.000
partner working	0.618		0.658		0.648		0.000	0.000	0.000
has child	0.435		0.478		0.409		0.000	0.000	0.000
child below 16	0.089		0.159		0.202		0.000	0.000	0.000
disable	0.032		0.039		0.044		0.000	0.000	0.000
Non-UK native	0.062		0.055		0.042		0.281	0.000	0.000
non-white	0.032		0.028		0.021		0.900	0.189	0.000
English language	0.788		0.903		0.799		0.000	0.045	0.000
father self-employed	0.267		0.182		0.133		0.000	0.000	0.000
mother self-employed	0.073		0.065		0.036		0.000	0.000	0.000
other household income	3091.039	2654.811	3148.637	1977.934	2929.702	1599.582	0.033	0.000	0.000
employs workers	0.304		0.041		0.000		0.000	0.000	0.000
hours worked per week	46.512	16.370	42.160	13.573	39.231	12.049	0.000	0.000	0.000
start own business	0.111		0.129		0.084		0.000	0.000	0.000
give up paid work	0.121		0.194		0.211		0.000	0.000	0.000
person-year observation	7166.000		11185.000		58340.000				
number of workers	1146.000		1149.000		9362.000				

Source: BHPS & UKHLS

Figure 4.7: Hbar mean of hours of work per week



Source: BHPS & UKHLS

Table 4.3: *Correlation table*

	Hourpay	Years of education	age	experience	female	married/ cohabitting	partner working	full time	second job	has children	child below16	disable	non-Uk native	English language	non-white	father self-employed	mother self-employed	hours workerd	other household income	employs workers	start own business	give up paid work
Hourpay	1																					
Years of education	0.2390*	1																				
age	0.1096*	-0.2974*	1																			
experience	0.0426*	-0.4083*	0.9930*	1																		
female	-0.0996*	-0.0263*	0.0318*	0.0405*	1																	
married/ cohabitting	0.0639*	0.0443*	0.1600*	0.0922*	-0.0168*	1																
partner working	0.0469*	0.1059*	-0.0169*	-0.0665*	0.0237*	0.7393*	1															
full time	0.0315*	0.0789*	-0.0418*	-0.1103*	-0.3544*	0.0250*	0.0139*	1														
second job	-0.0143*	0.0476*	-0.0379*	-0.0392*	0.0022	0.1192*	0.1299*	-0.1003*	1													
has children	0.0535*	0.0965*	-0.1070*	-0.1438*	0.0358*	0.4685*	0.4717*	-0.0823*	0.1052*	1												
child below16	-0.0305*	0.0610*	-0.0919*	-0.1163*	0.2645*	0.2971*	0.3429*	-0.3140*	0.0785*	0.7371*	1											
disable	0.1199*	-0.1035*	0.2202*	0.2395*	0.0043*	0.0482*	-0.0323*	-0.0229*	-0.0112*	0.0151*	0.0136*	1										
non-Uk native	0.0125*	0.0945*	0.0069*	-0.0167*	0.0164*	-0.0085*	-0.0097*	0.0066*	-0.0026	-0.0017	-0.0015	-0.0239*	1									
English language	0.0584*	0.0096*	0.0549*	0.0377*	0.0372*	0.3278*	0.2511*	-0.0086*	0.0841*	0.2059*	0.1609*	0.0976*	-0.1500*	1								
non-white	0.0095*	0.0570*	-0.0600*	-0.0647*	-0.0039*	-0.0125*	-0.0107*	0.0101*	-0.0035*	0.0176*	0.0132*	-0.0277*	0.3929*	-0.1261*	1							
father self-employed	-0.0366*	-0.0568*	-0.2702*	-0.1574*	-0.0108*	-0.1762*	-0.1322*	-0.0365*	-0.0051*	-0.0679*	-0.0405*	0.0085*	-0.0005	-0.1372*	0.0476*	1						
mother self-employed	-0.0242*	-0.1420*	0.1305*	0.2200*	-0.0243*	-0.0888*	-0.1337*	-0.0414*	-0.0243*	-0.1146*	-0.0903*	0.0509*	0.0361*	-0.0930*	0.0441*	0.2922*	1					
hours workerd	-0.0246*	0.0563*	-0.1023*	-0.1200*	-0.4199*	-0.0133*	-0.0371*	0.7569*	-0.0837*	-0.0752*	-0.3372*	-0.0272*	0.0082*	-0.0457*	0.0113*	0.0071*	-0.0111*	1				
other household income	0.3899*	0.2924*	-0.2644*	-0.2987*	-0.0687*	0.1788*	0.3344*	0.1177*	0.0845*	0.0978*	0.0309*	-0.0658*	0.0231*	0.0009	0.0183*	0.0086*	-0.0930*	0.1537*	1			
employs workers	0.0751*	0.0310*	0.0142*	0.0022	-0.0536*	0.1102*	0.0936*	0.0599*	0.0199*	0.0800*	0.0080*	-0.0045*	0.0043*	0.0360*	0.0089*	-0.0241*	-0.0154*	0.1411*	0.1038*	1		
start own business	0.0170*	0.0488*	-0.0481*	-0.0562*	-0.0475*	0.1204*	0.1401*	0.0300*	0.0836*	0.1277*	0.0481*	0.0073*	-0.0030*	0.0739*	0.0077*	-0.0056*	-0.0329*	0.0384*	0.0713*	0.0355*	1	
give up paid work	0.0510*	0.0589*	-0.0033*	-0.0218*	-0.0140*	0.2293*	0.2621*	0.0572*	0.0528*	0.1605*	0.0943*	0.0076*	-0.0182*	0.1454*	-0.0147*	-0.0479*	-0.0643*	0.0209*	0.1051*	0.0224*	0.2294*	1

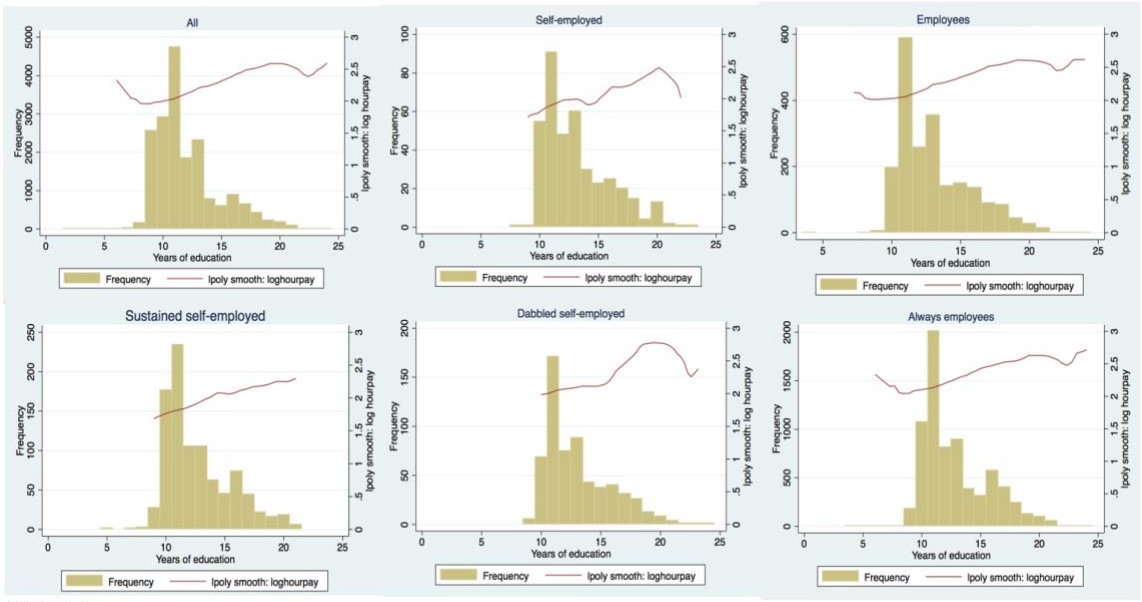
Source: BHPS & UKHLS

Table 4.4: *VIF Values*

Variables	VIF	1/VIF
child below 16	2.75	0.363739
married/cohabitting	2.63	0.38022
Average hours of work per week	2.55	0.392675
full time	2.44	0.409907
partner working	2.39	0.418404
has children	2.26	0.443228
female	1.76	0.567104
Age	1.3	0.767663
non-UK native	1.27	0.786336
non-white	1.25	0.797091
other household income	1.15	0.869311
father self-employed	1.12	0.895635
Years of education	1.1	0.905475
English language	1.1	0.910454
mother self-employed	1.09	0.921549
give-up paid work	1.06	0.944816
employs workers	1.05	0.956139
start own business	1.04	0.957501
disable	1.02	0.977545
second job	1.02	0.982691
Mean VIF	1.57	

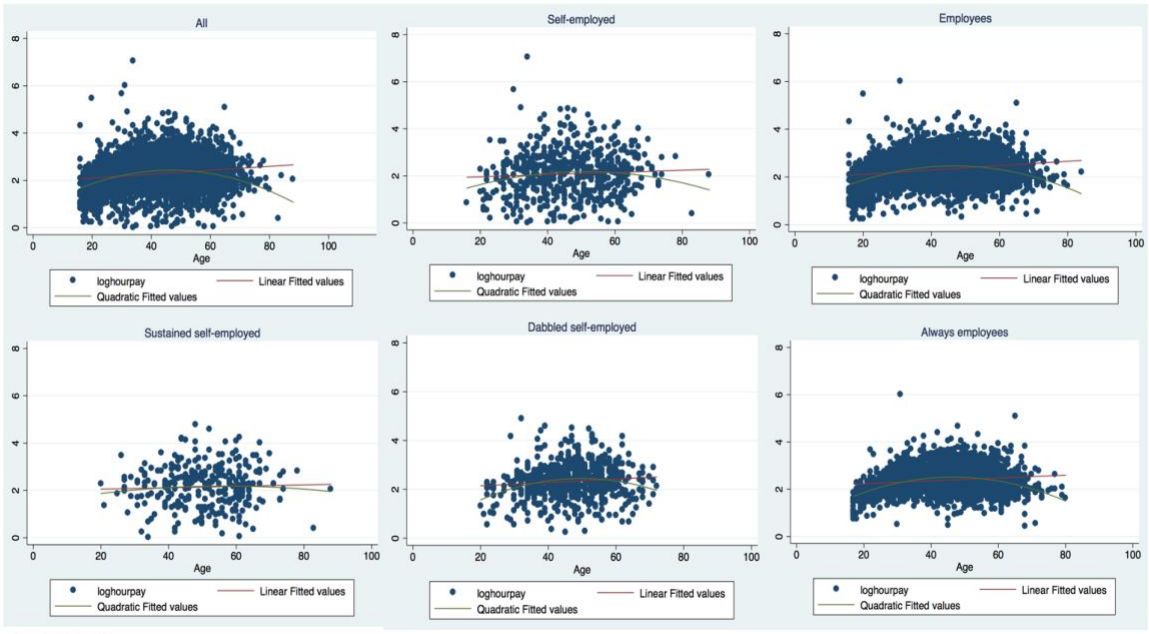
Source: BHPS & UKHLS

Figure 4.8: Lpoly graph of Years of education and log hourpay



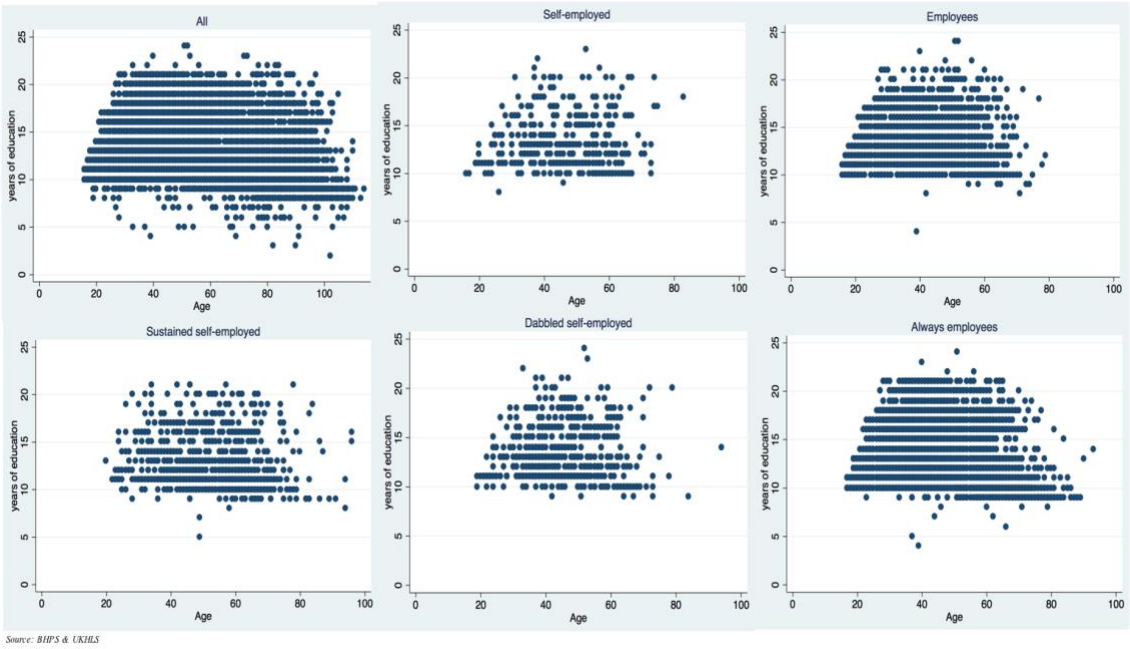
Source: BHPS & UKHLS

Figure 4.9: Scatter plot, linear and quadratic fit for log hour pay and age



Source: BHPS & UKHLS

Figure 4.10: Scatter plot of age and years of education



4.3.3 The Mincer Function

In 1958 Jacob Mincer created an important approach to understanding how earnings are distributed across the population. He extended the original human capital model to explain in his research why education enhances earnings and why earnings rise at a diminishing rate throughout a person life cycle. He tried to identify why the returns are smaller for those who are in an intermittent labour force, to explain why males earn more than females, why white workers earn more than black and why occupational distribution varies by gender (Polachek, 2007). Mincer (1974) showed that the returns to schooling are not related to schooling levels, since costs are only the costs of foregone earnings. Thus, any increase in the earnings per year of schooling is the rate of returns to investment in schooling. Also, the education coefficients do not actually report the education effect but only wage effects (Becker and Chiswick, 1966).

Using this method of analysis, the computed private rates of returns are underestimated due to the arithmetic necessity of the Mincerian function to assign forgone earnings to workers at all ages. Besides, it does not account for the non-monetary returns for education and the positive externalities. The Mincerian estimates are aggregate averages and have diminishing

returns on investments, where the higher level of average education in a sample, the lower the aggregate returns are, relative to the true returns on primary education (Weisbrod, 1962).

Henceforward, there are deficiencies in the Mincerian method that need to be noted, as it does not differentiate between educational levels, computes only private rate of returns to education, does not allow for non-monetary returns, assumes that the forgone earnings are the cost of education only and considers individuals to have an infinite time with a flat age-earning profile for the different levels of education (Psacharopoulos and Layard 1979). Also, it requires a large sample of individuals' observations rather than a pre-tabulated means of earnings. But, the advantage of the model is that it smooths out and handles low count cells in the age-earning profile matrix by the level of education.

Here, we use Mincer (1974)'s semi-log earning function to estimate the earnings returns to years of education for our division of worker.

The Mincerian's (1974) semi-log earning function for person i in year t (e.g. Harmon, Walker and Westergaard-Nielson (2001) p:3-5; Heckman *et al*. (2003); Borjas (2013) p:277; Fossen and Buttner (2013) p: 73) is:

$$\ln W_{it} = \beta_0 + \beta_1 educ_{it} + \beta_2 educ_{it} * sust_{it} + \beta_3 educ_{it} * dabb_{it} + \beta_4 sust_{it} + \beta_5 dabb_{it} + \beta_c' X_{it} + \beta_\lambda \lambda_{it} + c_i + \epsilon_{it}. \quad (4.4)$$

Where i =1…N equals to units under observation, t =1…. T equals to time for which data is collected. LnW_t is the dependent variable of natural logarithm of the deflated gross hourly wage at period t.$educ_{it}$is the years of education, $educ_{it} * D$ its interaction with the sustained self-employed and dabbled self-employed, where $sust_{it}$ and $dabb_{it}$ are dummy variables "D" marking sustainers and dabblers. X_{it} is a vector of control variables (see section 4.3.2 for more information about the variables), λ_{it} is a selection correction term (see section 4.3.4.5), β are the coefficients to be estimated, c_i is time invariant person-specific effect, which includes unobserved ability and ϵ_{it}; a time varying error term. β_1 is the coefficient that

measures the returns for the always paid employees, $\beta_1 + \beta_2$ is the sum of returns for the sustained self-employed and $\beta_1 + \beta_3$is the sum for the dabbled self-employed. We additionally estimate equation 4.4 but for our combined/general group of self-employed and paid employees by including a general self-employment dummy. This facilitates the comparison of the results in the extant literature. Hence, persons are considered as self-employed if they consider self-employment as their main activity and employees are identified as those who work at paid jobs (Carrasco and Ejrnaes, 2012; Borjas, 2013). As previously mentioned, this constitutes the general definition for our group of workers, without placing any restrictions on the number of times we observe workers in the sample and in unemployment and inactivity. Whereas, the sustained self-employed, dabbled self-employed and always employees follow the same division criteria established in the previous empirical chapter. In a robustness check we estimate separate earnings equations for the different divisions criteria; divisions 2, 3 4 and 5 and we compare how the results differ with our own division of sustained self-employed, dabbled self-employed and always paid employees.

4.3.4 Ordinary Least Squares, Fixed Effect, Random Effect, Instrumental Variable Method the Heckman Model and the Non-Linear model.

4.3.4.1 Ordinary Least Squares

For statistical inference, we control for the correlation of the regression model errors over years for our given respondents. The analysis starts by estimating a simple Ordinary Least Squares model, which is the dominant regression-based approach for the Mincerian equation (Card, 1999, 2001). But, the pooled OLS standard errors typically overstate the precision gained, resulting lower standard errors and larger t-statistic values (Cameron and Trivedi, 2009). They are only consistent when the model is appropriate and when regressors are not correlated with the error term. However, this is not always the case as the errors of given individual ‘i’ are positively correlated over time ‘t’, and for that reasons we use panel corrected standard-errors.

The panel-robust standard errors account for serial correlation and heteroscedasticity and are obtained without assuming any specific functional form for the correlation in the individual specific error term. Also, the nature of the survey data does not maintain the assumption of independence of sampled observations. Consequently, we relax the assumption of homoscedasticity and we cluster by PID (person identification number in the sample).

The cluster covariance matrix estimator permits the error variances to differ between clusters but not within and allows for correlation between the error terms in the same cluster. If these correlations are ignored this will cause biased and inconsistent standard errors.

Biased estimates can also result from unobserved individual heterogeneity such as ability, motivation and schooling quality which are difficult to measure. This is due to the omission of the variables in which data is available or when it is not observed. Thus, these factors may induce individuals to acquire more years of education and at the same time they can have a direct effect on earnings. For example, students with greater abilities are more likely to receive more schooling and receive more income. This could result in only a correlation between education and earnings without establishing any causal impact. One way to tackle this issue is by including additional regressors that try to measure worker's natural ability, such as the IQ test results or grades during schooling (Maluccio, 1998; Harmon *et al*., 2003). The downside in our datasets is that such additional information is not included, still controlling for omitted variables bias is necessary to have causal interpretation of parameter estimates (Cameron and Trivedi, 2009; see Harmon *et al.*, 2003).

Also, there is the issue of self-selection bias in occupation choice (see following section for further explanation). The estimates are corrected by accounting for potential selectivity bias problems due to the endogeneity of labour force participation and the endogeneity bias of education itself and its interaction with our group of dabbled and sustained self-employed.

Additionally, the OLS can provide biased estimates by comparing individuals that are not comparable in their observed characteristics. Matching Methods serve as a diagnostic test for making people more comparable, where the presence of personality characteristics might have an impact on earnings. These personality traits can be calculated into scores and serve as proxies to individuals' unobserved ability. A drawback in our study is the absence of these traits in our dataset but matching on observable covariates is still a way to make individuals in the treated and comparable group to be more similar in their observable characteristics. However, the method assumes that there are no remaining unobservable differences between the treatment and comparison group. Although, this reduces the omitted variable and bias coefficient problem and provide a more robust, the estimates obtained are less precise than the OLS (Sianesi, 2010; Almlund, Duckworth, Heckman and Kautz, 2011). Therefore, we are reserved from using this approach.

4.3.4.2 Panel data Models

4.3.4.2.1 Random Effect and Fixed Effect models

We are interested in the differences in returns between the sustained self-employed, dabbled self-employed and the always employees, meaning $\beta_1, \beta_2 \text{and} \beta_3$. These coefficients vary over time. We use the generalised least square to estimate the random effect model. The RE model can be viewed as a specialisation of the pooled OLS model. It allows the intercept, β_0 to be subsumed into the error term. Accordingly, equation 4.4 can be viewed as regression of $\ln W_{it}$ on the control variables X_{it} with a composite error term $u_{it} = c_i + \epsilon_{it}$. The RE model imposes that the composite error term u_{it} to be equicorrelated (Cameron and Trivedi, 2009). The OLS estimates will stay consistent under the RE model but will no longer be efficient if the RE is the true model.

We control for the unobserved ability bias that influences the number of years of education and individuals' earnings by employing Fixed Effect methods. Different from the

RE model, the FE model allows the correlation between the disturbance term $u_{it} = c_i + \epsilon_{it}$ and the time-variant independent variables; hence letting the unobserved individual heterogeneity to be correlated with regressors. Whereas the RE model does not permit such association to exist, and a strong assumption is made to treat the unobservable individual heterogeneity as independently distributed from the regressors. Compared to the FE model, the purely random effect allows consistent estimation of all time-variant and time-invariant parameters, but this model is not consistent if the FE model is the true model (Cameron and Trivedi, 2009).

Both models consider the characteristics of one person in the survey to be more similar over time when compared with other persons' characteristics and individuals' effects to be random.

The individual specific effect u_i is unknown and cannot be consistently estimated in short panel data, therefore it is eliminated by taking the expectation of $E\{\ln W_{it}, | c_i, X_{it}\}$ in respect to c_i, leading to (please refer to Chamberlain (1980, 1984), Wooldridge (2002) and Cameron and Trivedi (2009) for further explanation):

$$E\{\ln W_{it} | X_{it}\} = E\{c_i | X_{it}\} + X'_{it}\beta. \quad (4.5)$$

The RE model assumes that $E\{c_i | X_{it}\} = \alpha$, so $E\{\ln W_{it}, | X_{it}\} = \alpha + X'_{it}\beta$,and it is possible to identify $E\{\ln W_{it} | X_{it}\}$. However, this assumption is constantly viewed as unattainable in many microeconometric application (Cameron and Trivedi, 2009 p:702).

The FE model assumes that $E\{c_i | X_{it}\}$ vary with X_{it}, but it is unknown how it varies, this is why we cannot identify $E\{\ln W_{it} | X_{it}\}$. Accordingly, the FE only permits the identification of the marginal effect $\frac{\delta E\{\ln W_{it} | c_i, X_{it}\}}{\delta X_{it}}$, and even then for only time-varying regressors, so that the marginal effect for the variables; gender, race and ethnicity are not identified. This FE model is the preferred method in modern econometric literature to eliminate the potential ability bias in the model, as it allows to establish causal effect under weaker assumption in the panel data

(Cameron and Trivedi, 2009; Fossen and Buttner, 2013). The model transforms all variables into deviation from their own specific mean and eliminate the $u_{it}$from the equation. By doing so, it tries to reduce the serial correlation in the error term but does not totally terminate it (Cameron and Trivedi, 2005 p:705). However, the limitation of the FE model is that it cannot control for time varying unobservable characteristics that are correlated with the variable of interest.

4.3.4.2.2 Hausman test

We can formally evaluate the appropriateness of the model by using the Hausman test (Wooldridge, 2006). The Hausman test compares the coefficient vectors from the RE and FE estimators. If both estimates are consistent, we should not observe a significant difference between the two, whereas if one is inconsistent we would expect a significant difference between the models. We recall that the FE estimate is always consistent but inefficient under the null hypothesis that $\mathrm{Cov}\{X_{it}|c_i\} = 0$,whereas the RE is both consistent and efficient under this hypothesis. The null hypothesis of the Hausman test is in favour of the RE model. If we reject the null hypothesis, the RE is no longer efficient and we should use instead the FE model. Still, there are many caveats in the FE model, as it cannot predict the conditional mean, but only the changes over the conditional mean caused by the changes in the time-varying regressors over time. Even if the time-varying coefficients are estimated, these estimates may not be precise if the variations in the regressors are across workers rather than over time. Thus, for these reasons economists also estimate the RE model and rely sometimes on these estimates even if the causal impact is not established.

4.3.4.2.3 Limitations of FE model

The main limitation is that we cannot estimate time in-variant variables in the FE model, because they are absorbed in the individual specific effect like; race, gender and ethnicity, and are eliminated in the demeaning process. This especially applies for the coefficient β_1 on

education, where education does not change over time for our working sample. However, in our study, we encounter a group of workers with time-varying education during the observed timeline (during the twenty-three years span). These group of people are small in numbers compared to the sample size we are working with. Hence, when looking at their returns we assume that the changes in education are random on individual level and are not related to other things that may also affect wages. This is a strong assumption to follow, because those returns to education are from a non-randomly selected sample; this is for the particular group of workers with particular type of education, and so the returns are not necessarily generalisable, and are only used for robustness checks only. Hence, we run separate analysis for these groups of workers with time-varying years of education and estimate and compare the returns with those with unaffected years of education.

A similar caveat is also found when using the first-difference estimators, although it yields consistent estimates with the FE model, but does not identify the coefficients for time-invariant regressors. Consideration arises when using unbalanced panel data, where we would lose more than two observations if a single period is missing in the time-frame of the study, as this is the case in our study, where we have missing data for year 2009 (Wooldridge, 2006). Therefore, we restrain from using this estimate in our analysis.

OaXaca and Gleiser (2003) identified how it is still possible to consistently estimate the effect of time invariant regressors using a two-stage procedure. They considered the single equation model with an unbalanced dataset and time invariant regressors using the two-stage Generalised Least Square estimation model to consistently estimate the coefficient of the time invariant regressors. They demonstrated the equivalence between the GLS coefficient estimates and OLS coefficient estimates for the panel data model, noting that the estimated standard errors are different between the two procedures. Also, Plumber and Troeger (2007), proposed a three-step procedure for the estimation of the FE Model using a Fixed Effect Vector

Decomposition Estimator. This vector decomposition procedure allows to estimate time-invariant variables in an augmented FE model and is done through three stages. The first stage consists of running the FE model but without any time-invariant variables, the second stage is to decompose the unit effect vector into two parts; the time-invariant variables and the error terms, and the third and final stage is to re-estimate the first stage by using pooled OLS while including the time-invariant variables and the error term from stage 2 (Plumber and Troeger, 2007, p:1). They claimed that the model provides efficient estimators for the time-invariant regressors in the FE model. It is simple to perform and superior than the OLS and RE models in estimating time-invariant variable and from the Hausman and Taylor (1981) model in estimating time-invariant variables correlated with the unit effects. However, Green (2010) questions their approach and does not approve the claims presented above. He argues that the efficiency gains are illusive, as the FEDV estimator just reproduces identical estimators to the linear FE model, then substitutes them with an inappropriate and wrong covariance matrix, with the part of the parameter vector still unidentified. The estimator just turns the FE into RE model, conversely this can be simply done using GLS estimation, where all parameters can be identified, and estimators are efficient. As such, we restrain from using these methods.

We follow an additional approach and rely on the Instrumental Variable methods to deal with the unobserved heterogeneity that lead to omitted variable bias problem. By principle the endogeneity problem of the time-invariant variable "education" can be corrected using the IV methods, but in real practice it is very difficult to find valid instruments.

4.3.4.3 Instrumental Variable Method

4.3.4.3.1 IV Model

Because of the time invariant nature of education, most studies rely on Instrumental Variable methods to deal with the endogeneity bias problem. The endogeneity problem occurs when one or more of the variables included in the regression are correlated with the error term. The IV

technique can overcome the estimation bias of a linear model, but such method is not directly applicable if models include qualitative variables (Arendt and Holm, 2006; Carrasco, 2001). The IV is only applicable if the suspected independent variable and dependent variable are both continuous. If the model deals with categorical variables, the standard two-stage method provide inconsistent results for a nonlinear discrete model (Carrasco, 2001, p:385). Thus, we adopt this method, as it has the advantage of identifying also β_1 and not only the differences between the employment types.

The standard regression results assume that the regressors are not correlated with the error term and only the effect of the education regressors educ_{it} on $\ln W_{it}$ is direct via the term $\beta_1 \mathrm{educ}_{it}$. Hence there is no association between the error term u_{it} (where$u_{it} = c_i + \epsilon_{it}$). So educ and u_{it} are independent causes of $\ln W_{it}$. This is shown in the below path analysis diagram (refer to Cameron and Trivedi, 2009 p:95):

$$\mathrm{educ}_{it} \rightarrow \ln W_{it}$$

$$u_{it} \nearrow$$

But in some cases, there may be some association between educ_{it} and u_{it}, where the u_{it} term contains other factors than education that might have impact on wages such as ability. Which also might influence educational attainments (since higher ability might induce higher levels of education). This is shown in the below path analysis diagram:

$$\mathrm{educ}_{it} \rightarrow \ln W_{it}$$

$$\uparrow u_{it} \nearrow$$

Thus, there is both effects on $\ln W_{it}$; a direct one via $\beta_1 \mathrm{educ}_{it}$and an indirect one via u_{it} affecting educ_{it} which in turn affect $\ln W_{it}$. This creates biased and inconsistent estimates of β due to the endogeneity of the education variable educ_{it}.

A treatment approach is needed to generate only exogenous variation of educ_{it}. We use the IV method and include an instrument Z (here we use $\mathrm{fathereduc}_{it}$, if respondents' fathers

have educational qualification, schooling degree and above, in contrast to not being educated). This has the property that changes in Z(fathereduc_{it}) are associated with changes in educ_{it} but do not lead to direct changes to $\ln W_{it}$. Parents' level of education has strong influence on children's educational attainments and outcomes (OECD, 2014; Dickson, Gregg and Robinson, 2016). This is explained by the intergenerational link; where the characteristics that lead parents to acquire more education also impact the way they raise their children, where educated parents provide better childhood experience and educational environment for children to do better in school and reach higher educational attainment (Dickson, Gregg and Robinson, 2016 p:184).

The notation of the effect of fathers' education is shown in the following diagram:

$$\text{fathereduc}_{it} \rightarrow \text{educ}_{it} \rightarrow \ln W_{it}$$

$$u_{it} \nearrow$$

Hence, we introduce the father education variable as an instrument Z that is associated with workers' education but not with u_{it}. There still the case that Z will be correlated with $\ln W_{it}$ but indirectly througheduc_{it} which in turn determine $\ln W_{it}$. Z is said to be an instrument (R1) if it is not correlated with the error term u_{it}, $E\{u_{it}|Z_{it}\} = 0$,and (R2) if it is correlated with the regressor educ_{it}. These are the requirements for an instrument to be considered, but we cannot test the first requirement (R1) because $u_{it}$is unobservable. As such father's education should satisfy the exclusion assumption, where the supposition for parental education being a good instrument, the theory assumes that the effect of parental education works only through the children education and does not affect, for example, unobserved ability. This is in line with the validity condition, where parental education should not have any direct impact on children wages, hence father's education should not be correlated with any unobservables that also affect child's wages and do not work via education.

The equation below is the structural equation model, where it is assumed that the educ_{it} variable along with its interaction with sustained and dabbled self-employed is endogenous and the remaining regressors are not correlated with the error term u_{it}:

$$\ln W_{it} = \beta_0 + \beta_1 \text{educ}_{it} + \beta_2 \text{educ}_{it} * \text{sust}_{it} + \beta_3 \text{educ}_{it} * \text{dabb}_{it} + \beta_4 \text{sust}_{it} + \beta_5 \text{dabb}_{it} + \beta_c' X_{it} + \beta_\lambda \lambda_{it} + u_{it}. \quad (4.6)$$

The basic idea here is to replace the actual realised values of educ_{it} which are correlated with u_{it} by the predicted values of $\hat{\text{educ}}_{it}$ that are related to the actual educ_{it}, but not correlated with u_{it}. Thus, predicted values are formed by projecting educ_{it} on set of instruments; here we use father's education and its interaction with the dummy variables indicating if workers are denoted as dabblers or sustainers as instruments for educ_{it} .

To test the second requirement (R2) and ensure that the predicted values $\hat{\text{educ}}_{it}$ are related to the actual educ_{it},we express a reduced form equation of the endogenous variable $\text{educ}_{it}$with all exogenous variables. The reduced form equation (also, called the first-stage equation) for educ_{it} is:

$$\text{educ}_{it} = \delta_{11} + \delta_{12} \text{fathereduc}_{it} + \delta_{13} \text{sust}_{it} + \delta_{14} \text{dabb}_{it} + \delta_{1c}' X_{it} + \delta_{1\lambda} \lambda_{it} + \rho_{1it}. \quad (4.7)$$

Similarly, we use the same instrument and interact with the sustained and dabbled self-employed dummy variables to deal with the endogeneity problem of the education variable interacted with these two types of workers in equation (4.6). The endogenous variables are just identified and the reduced form equations for $\text{educ}_{it} * \text{sust}_{it}$ and $\text{educ}_{it} * \text{dabb}_{it}$ are:

$$\text{educ}_{it} * \text{sust}_{it} = \delta_{21} + \delta_{22} \text{fathereduc}_{it} * \text{sust}_{it} + \delta_{23} \text{sust}_{it} + \delta_{24} \text{dabb}_{it} + \delta_{2c}' X_{it} + \delta_{2\lambda} \lambda_{it} + \rho_{2it}. \quad (4.8)$$

$$\text{educ}_{it} * \text{dabb}_{it} = \delta_{31} + \delta_{32} \text{fathereduc} * \text{dabb}_{it} + \delta_{33} \text{sust}_{it} + \delta_{34} \text{dabb}_{it} + \delta_{3c}' X_{it} + \delta_{3\lambda} \lambda_{it} + \rho_{3it}. \quad (4.9)$$

To meet the second requirement, the estimated instrument coefficients; δ_{12}, δ_{22} and δ_{32} must be significant to have informative power, and to simplify the model (4.6) can be written in the following:

$$y_i = \dddot{X}_i\beta + u_i. (4.10)$$

Where the regressors $\dddot{X}_i$ combine the endogenous "X_i" and the exogenous "X_i'" variables and y_i is the dependent variable. z_i' combines all the instruments for the variables, where we regress y_i on $\dddot{X}_i$ using z_i' .

Hence, z_i' is the vector of IV, where it satisfies the conditional moment restriction and has strong informative power:

$$E\{u_i|z_i\} = 0. (4.11)$$

And

$$E\{u_i|X_i\} = 0. (4.12)$$

4.3.4.3.2 Limitations of the IV model

There are several problems with the IV approach, mainly because instruments used are found to be weak (those that are correlated with wage, but hardly correlated with education) and invalid (correlated with both wages and education), both leading to biased estimates (Imbens and Angrist, 1994; Bound, Jaeger and Baker, 1995; Angrist, Imbens and Rubin, 1996; Heckman and Li, 2004; Dickson, 2013). Also, The IV approach cannot relax the linearity assumption between education and log of earnings, but this is not a big issue if the non-linearity is explained by the ability bias in the model. However, Belzil and Hansen (2002) and Belzil (2006) show the non-linearity is not reflected in the omitted ability bias.

Another problem is the IV paradox itself, where we would expect the education premium to be lower using the IV method than the OLS approach when education is endogenous and when ability bias is the major problem. Card (2001) tried to explain the low

estimates by pointing out that the IV estimates are for a marginal person, whereas the OLS estimates are for an average person. Strangely, the evidence found shows the reverse scenario, where the IV estimators are somehow larger than the OLS estimates (Maluccio, 1998; Blundell *et al.*, 2000; Harmon *et al.*, 2003; Dickson, 2013). This may simply be due to measurement errors or the problem with the choice of instruments. Apart from that, the IV estimates may be upward biased than the OLS estimates because of unobserved differences between the characteristics of the treatment and comparison groups (Bound, Jaeger and Baker, 1995). As the IV estimates recovers the returns to education for the population group that is mostly affected by the intervention and the IV estimates capture the "Local Average Treatment Effect" (Dickson, 2013 p:477). As Card (1995) explained, the less educated are workers with lower returns to schooling (perhaps they are less able) or with higher discount rates (do not show much interest to education and come from poorer background). So, when an intervention is used as an IV instrument, it mainly affects those group of people, and reflect their marginal returns to schooling that might well exceed the returns of the whole population. In this case, the IV estimates provide better assessments on the returns to education for the affected group rather than the whole population (Card, 1999, 2001).

Difficulties also arise in interpreting the Instrumental variable method because of data limitation and complexity in finding a valid instrumental variable estimator that satisfies strict conditions; where instruments should not be correlated with other latent characteristics of individuals that may reflect on earnings that in return yield to biased estimates (Card, 1999 p:1821).

4.3.4.3.3 Instruments used in IV studies

The majority of IV studies rely on changes of compulsory schooling requirement as instruments to isolate the causal impact of education on earnings. These educational reforms induce certain groups of low educated people to increase their schooling relative to previous

cohorts. Angrist and Krueger (1991) used the presence of compulsory schooling law across US cohort for the years 1970-1980 Census, examining men born in years 1920-1929, 1930-1939 and 1940-1949. The idea behind the use of such law as instrument, is that person who are born earlier in the year will have smaller amount of schooling than persons born later in the same year, as they reach their minimum school leaving age. They estimated the returns for the marginal group hit by the treatment known by the Local Average Treatment Effect (Harmon and Walker, 2001 p:61). The OLS estimates show 6.3 percent estimate of return to schooling, whereas the IV approach show larger percentages, about 8.1 percent. But, Bound, Jaeger and Baker (1995) re-examined their work and found that the IV estimates may suffer for finite sample bias and might be inconsistent as well.

Card (1995) used an indicator of the proximity to college or university as instrument for schooling, using the US National Longitudinal Survey data for men, aged between 14 to 24 in 1966 and sampled as employees in 1976. The returns estimates were found to be around 7.3 percent using OLS and 13.2 percent for the IV methods. But these estimates were rather imprecise as one might argue that people who live long way from college are more likely to be in a low-wage labour market. Thus, the distance from schooling may be uncorrelated with the ability and wages and instead correlated with socio-economic characteristics.

In a series of papers Harmon and Walker (1995, 1999a, 2000) were the first to exploit the changes in the minimum school leaving age law in the UK, using the UK pooled Family Expenditure Survey, the UK General Household Survey and the UK National Child Development Survey, for men aged between 16 to 64. They used the changes in compulsory school leaving age law in the years 1947 and 1970's and other educational reform acts and peer effects as instruments for schooling. However, they did not control for cohort effect and their estimates were considered rather upward bias (in the range of 10 to 15 percent, compared with OLS estimates between 5 and 6 percent). Later work by Dickson and Smith (2011), using the

Quarterly Labour Force Survey and Dickson (2013) using the BHPS looked at the Easter Leaving rule, the 1973 raising of school leaving age RoSLA and smoking as instruments for schooling. The rationale behind choosing 'smoking' as an instrument is the perceived indication of time preference, where people who smoke have high discount rates and are more likely to stratify their current want at the expense of future (Evans and Montgomery, 1997; Harmon and Walker, 2001). Dickson (2013) found strong statistical indication for the variation in academic qualifications. The advantage of having multiple instruments is to test the validity of the preferred estimates. However, the RoSLA are affected by those who wanted to leave school early. In this situation, the IV estimates on returns to schooling report for those who are at the bottom of the schooling distribution and who were forced to stay longer. Hence, it provides little indication on the returns to schooling for the whole population.

In contrast IV studies based on family background do not suffer much from this problem. They have strong predictive power for education and are not only concerned with a specific subsample. Also, the IV estimates based on family background tend to exceed the OLS estimates by only smaller margin, where the bias from genetic and environment transmission, caused by the intergenerational mobility is removed (Dickson, Gregg and Robinson, 2016 p:187). This is when the use of parental education only generates variation in young people's education that is orthogonal to the unobservable when the variation in parental education is exogenous.

Dearden (1995, 1998) used family composition; the presence of siblings and parental education as instruments for schooling. Her study used the National Child Development Study data from the UK for men born between 3rd and 9th of March in 1958 and found that the returns to schooling compared with the OLS estimates are almost equivalent (4.8 percent in OLS estimates compared to 5.5 percent, using the IV method). Ermisch and Francesconi (2001) established a strong influence of parents investing in the education of their children. Maurin

and McNally (2008) found that increase in parental education significantly reduces the probability of children to be held back in their grades. Hoogerheid *et al*., (2012) argued that father's education might have a direct effect on earnings that does not work through education. Lam and Schoeni (1993) reported that fathers with university degree instead of being illiterate provide a 20 percent wage premium to children by delivering an improved learning environment and effective family connection in the job market. Dickson, Gregg and Robinson (2016), using the Avon Longitudinal Study of Parents and Children found that increasing parents' education, through the raising of the school leaving age (RoSLA) in England, which occurred in 1972; has a positive causal effect on children's outcome since the age of 4 and visible up till they take their high stakes examinations at the age of 16.

Walker and Zhu (2001) used separately spouse and parents' educational qualifications as instruments for schooling and found the IV estimates to be over 20 percent higher than the OLS estimates, with all three instruments yielding the same conclusion. Similar findings were shown in Trostel, Walker and Woolley's (2001) work using mother's and father's education, with strong correlation between the instruments used and the reported schooling. Conversely, Rischall (1999) questions the legitimacy of these instruments and Card (1999 2001) reveals doubt on using parental background (especially father's education) as identifying instruments because they are proxy for ability and directly affect schooling as well as wages. But, Hoogerheid *et al*., (2012) justified how using father's education in the SOEP data as instrument in earnings regression is viable when relaxing the strict exclusion restriction assumption, as the size and impact of the bias produced by the potential direct effect of this instrument on earnings is very small and minimal. Fossen and Buttner (2013) with the SOEP unbalanced data from 1998-2001 used fathers' education as instrument, and found strong prediction power on the schooling effect, however the instrument did not solve the problem of the time-varying entrepreneurial ability.

In our analysis here, we follow a similar approach to Hoogerhei, Block and Thurik (2012) and Fossen and Buttner (2013). We use father education as an instrument and its interaction with the dabbled self-employed and the sustained self-employed to account for the endogeneity of education and its interaction with our subgroups of self-employed and test for the plausibility of this instrument. For fathers' education the data is more restrictive; where there is no information regarding the age when parents left full time education, and not much on all the qualification achieved. Therefore, we construct (0, 1) qualification indicator, capturing whether fathers have received any qualification (schooling qualifications, further education or university degree), compared to none.

4.3.4.4 Non-random selection and the Heckman Model.

4.3.4.4.1 Non-random selection

Other than the endogeneity problem, we also look at the self-selection bias in occupation, where the earnings regression includes only persons who report earnings from either employment or self-employment, aged 16 and above. We exclude from the sample observation persons who are currently in education and vocational qualifications, in military or community service, farmers, retired workers, and civil servants because these are not confronted with the choice to enter the labour market and their earnings are not much determined by the market itself. We also exclude family members who help in the family business because in the sense they are not originally self-employed, as they did not initially start the business by themselves. Problem occurs when trying to estimate the earnings returns to education here, as some individuals who have received schooling are not working, thus are not observed and their returns are not computed (Puhani, 2000). Those people will have an offered wage y below their reservation wage y^*. Then, if schooling has a positive return on wages, individuals with low levels of schooling will be offered lower wages and will have less employment opportunities than those with more years of schooling. As a consequence, we might not be able to observe

all individuals with higher schooling if they are not working. This might leave us with estimating the returns to education for people with low levels of schooling who are offered high wages. Accordingly, the data in the survey would not be randomly selected and is incidentally truncated. This creates the sample selection problem where the OLS estimates are downward biased and the sample of working people is not representative of the population we are interested in (all people who have received schooling) (Puhani, 2000).

Moreover, there are problems with the self-selection bias, where workers self-select themselves into jobs for which they are best suited for. By that, the choice of work, either for the self-employed or paid workers is no longer random and can produce biased estimates (Ashenfelter, Harmon and Oosterbeeek, 1999; Card, 1999; Harmon, Oosterbeek and Walker, 2003; Shane, 2006; Dickson and Harmon, 2011; Henderson, Polacheck and Wang, 2011). However, we believe, whilst there are methods available to accommodate non-random selection into the various labour market states, across which we wish to compare the earnings returns; identifying a group of individuals who are on the margins of being self-employed or employees (dabblers), provides us with a group who are (necessarily) selecting into both states. Thus, sequentially capturing their returns to education, and comparing this to those for employees and those who sustain in self-employment, allows us to add significantly to understanding in this area. Hence, we are not addressing the choice of self-employment and dabblers.

But, selectivity is not the only the source of bias here, also the subject of research itself plays a part in this matter, where the selection bias result from the correlation between the errors and the dependent variable (Winship and Mare, 1992 p:329). Hence the comparison of returns between workers would lead to biased estimates due to the [potentially unobservable] inter- and intra- differences within workers in self-employment and between paid employment, rather than providing insight into the different returns that an individual can expect from being

self-employed, compared to being a paid employee (Ashenfelter, Harmon and Oosterbeek, 1999; Harmon, Oosterbeek and Walker, 2003, Shane, 2006; Dickson and Harmon, 2011; Henderson, Polacheck and Wang, 2011).

4.3.4.4.2 The Heckman Selection Model

The Heckman (1974, 1978, 1979) model was developed to handle the selection problem by treating the selection problem as an omitted variable and correcting for the bias in the estimation of the outcome equation by explicitly using information from the model of sample selection; the inverse Mills ratio λ. This method is implemented via two-step of limited information maximum likelihood (LIML) method, using simple least square algorithm and has become the standard estimation procedure for the empirical wage equation (Puhani, 2000). To explain the model, we can write two equations; the regression wage equation and selection equation for individuals who are working (see Wooldridge (2002) chapter 17; Greene (2007) chapter 24 and Green's (2006) working paper).

The regression wage equation is:

$$y_i = \beta x_i' + \varepsilon_i. (4.13)$$

where y_i is wage variable, x_i is a vector of explanatory variables, all of which are exogenous in the sample, and $\varepsilon_i$is an error term.

The selection is determined by the following equations:

$$s_i^* = w_i'\gamma + u_i. (4.14)$$

$$S_i = \begin{cases} 1 \text{ if } s_i^* \geq 0 \\ 0 \text{ otherwise} \end{cases}. (4.15)$$

Note that the selection equation indicates that the wage y_i is only observed when individuals are considered working $s_i = 1$ and earn their income from either self-employment or wage employment. The selection model also assumes that the error terms $u_i$and $\varepsilon_i$are correlated and have a nonzero correlation ρ. The vector w_i is assumed to contain all variables in the vector x_i plus some additional variables that are always observed regardless of whether y_i is observed.

The assumption made above are under the following conditions:

- Observability $x_i w_i\ s_i$ and the exogeneity of x_i and w_i.
- $u_i, \varepsilon_i \sim$ bivariate normal $[0, 0, 1, \sigma_e, \rho]$ this implies that:

$$E(\varepsilon_i|u_i) = \beta_\lambda u_i. \quad (4.16)$$

where β_λ measures the covariance between ε_i and u_i.

The sample selection bias occurs when some individuals are not included in the sample, and when ε_i and u_i are correlated, meaning that β_λ is different from zero.

To check the following we derive the expression $E(y_i|w_i, s_i = 1)$ where:

$$E(y_i|w_i, s_i) = E[E(y_i|w_i, u_i)|w_i, z_i]. \quad (4.17)$$

Hence, when using (4.13) we obtain:

$$E(y_i|w_i, s_i) = \beta x_i' + \beta_\lambda h(w_i, s_i). \quad (4.18)$$

Where $h(w_i, s_i) = E(u_i|w_i, s_i)$. Because we observe the wage for the selected sample only when $s_i = 1$, and we only need to find $h(w_i, s_i = 1)$. Thus, the model assumption implies that:

$$E(u_i|w_i, s_i = 1) = E(u_i|u_i - w_i'\gamma) \quad .(4.19)$$

where:

$$E(u_i|u_i - w_i'\gamma = \frac{\emptyset(-w_i'\gamma)}{1-\phi(-w_i'\gamma)}. \quad (4.20)$$

u_i follows a standard normal distribution, $-w_i'\gamma$ is a constant, $\emptyset$denotes the standard normal probability density function, and ϕ is the standard normal cumulative density function. Thus:

$$E(u_i|u_i - w_i'\gamma = \frac{\emptyset(w_i'\gamma)}{\phi(w_i'\gamma)} = \lambda(w_i'\gamma). \quad (4.21)$$

And $\lambda(w_i'\gamma)$ is the inverse Mills ratio. Therefore, the fully parametric expression value of y_i, conditional on observable variables w_i that accounts for the selection sample $(s_i = 1)$is:

$$E(y_i|w_i, s_i = 1) = \beta x_i' + \beta_\lambda \lambda(w_i'\gamma). \quad (4.22)$$

We address the potential selection in time-varying observable using Heckman's (1979) two-step selection correction. We first estimate a binary equation models for each year separately

and in the second equation we introduce the inverse Mills ratio λas an additional regressor in equation 4.4. The participation equation includes the same control variables included in the vector X_{it} , with additional two variables for better identifications; the gross labour income from other household members and indication if respondent's father was previously self-employed.

We use the sum of the gross monthly income from other households as it might influence their decision to enter labour market. This is especially relevant for the case of respondents with working partner. Indeed, the additional income might provide a safety net for workers and might discourage them to work. But this variable does not have impact on the productivity of workers, consequently not on respondents' earnings conditional to working. This variable may vary over time and is used in the analysis here to correct for the self-selection in the FE model.

The second variable used in the selection model is the dummy variable indicating if respondents' fathers were self-employed back at the age of 14. This variable is a time-invariant variable that helps control for the self-selection problem in the IV and the OLS model. Also, it helps predicts the participation precisely for the self-employed (Taylor, 1996), where Taylor (2001) identified that self-employed fathers increase the probability of their children to enter self-employment. According to Karagiannaki (2017), parental wealth may allow access to better jobs through connections and social network and can also provide necessary capital for business start-ups, thus influencing children's self-employment prospects. This can translate into labour market advantage for children by allowing them to sustain longer and fund more costlier job searches which could result in better job matches and ensure more secure employment and higher wages. However, Fairlie and Robb (2007) argued that father's self-employment history does not influence own sibling's performance. While the existence of positive relationship between family background and children's outcome is well-established in

findings (Blanden *et al.*, 2004; Chevalier *et al.*, 2005), the characteristics of the intergenerational transmission process and the extent to which this relationship is causal is still an ongoing debate (Karagiannaki, 2017 p:1).

Although we consider the self-selection bias for respondents who are working in self-employment and paid employment, the non-random selection is also present between our division of workers, where we believe that having a group of workers [the dabblers] who are at the margin between self-employment and paid employment, provide us with a group who (necessarily) selecting into both states. Thus, the education variable with its interaction with sustained self-employed and dabbled self-employed in equation 4.4 would be considered endogenous. This is because the choice of division within self-employment might depend on unobserved ability specific to self-employment which is time-invariant, included in the error term in u_i and eliminated in the Fixed Effects estimation. At the same time the division between the dabblers and sustainers is also captured by the time spent in self-employment (similar to the case of necessity and opportunity entrepreneurs in Fossen and Buttner's (2013) work). Yet, we could not find any convincing instrument for the time-variant ability to be able to combine the FE and IV estimation which would generate consistent estimation of the coefficients and their interaction terms over time. The FE IV model could not be run in this study as the instruments used are time-invariant and could not work in the panel context with FE model , however we leave this potential issue for future research.

4.3.4.5 Non-Linear Model

Other than the problem of the endogeneity of education and self-selection bias into occupation, the basic Mincer model assumes a linear relation between the log of wages and the years of schooling. Evidence (e.g. Card and Krueger (1992), Mincer (1997), Belzil (2006)) suggests that this relationship is becoming more complex, where the returns to education are becoming increasingly convex. The non-linearity assumption is a response of the increase in the relative

demand for human capital and due to the presence of the "sheepskin" effect that focuses on levels of educational achievements (Belman and Heywood, 1991; Jaeger and Page, 1996). Henceforth, achieving credential education (schooling or university degree) has become more important than non-credentialed education. Mincer (1974), Pscacharopoulos (1985, 1994) and Harmon and Walker (1999a) identified diminishing returns to education. Card and Krueger (1992) found increasing returns at low levels of education, and Heckman *et al*. (2003) suggest the same findings, but with returns diminishing at high levels of education. Whereas Heckman and Polacheck (1974), Card and Krueger (1992) and Card (1995, 1999) argued that the returns to schooling are constant. Thus, the general nature of possible non-linearity in the returns to education is still an unclear matter (Trostel, 2005 p:192).

In the analysis, we include a quadratic term in years of education to allow for more flexible specifications. Also, we consider the possibility of non-constant returns to education, where the log wages are a nonlinear function of education levels. We split the education variable into dummies for different levels (no qualifications, university degree, A-levels, GCSE and other qualification), reference to the dummy variable indicating no qualification and control for the number of years of education. We expect the nonlinearities to differ between the always employees and dabbled and sustained self-employed and between the general/combined group of self-employed and paid workers, where we employ the non-linear extension of the standard Mincer wage equation using OLS approach only, because there are no instruments available for the extra education terms. Hence for each group separately, we estimate the following extended semi-log earning function for person i in year t:

$$\ln W_{it} = \beta_0 + \beta_1 \text{degree}_{it} + \beta_2 \text{Alevels}_{it} + \beta_3 \text{GCSE}_{it} + \beta_4 \text{otherqual}_{it} + \beta_c' X_{it} + \beta_\lambda \lambda_{it} + c_i + \epsilon_{it} \quad (4.23)$$

4.4 Empirical Results

In this section, we first examine the regression results for the general/combined group of self-employed and paid workers and then for our division; the sustained self-employed, the dabbled self-employed and the always employees. Later we consider the possibility that the returns to education are not constant, and the log earnings is a nonlinear function of years of education, with such non-linearity may exist between our division of workers. Hence, we repeat the regressions using an additional quadratic term for the years of education and the corresponding interactions with sustained and dabbled self-employed. In addition, we run the analysis using highest reported educational qualifications, while controlling for years of education and we check how the results vary when using credentials instead. This is then followed by some sensitivity analysis, looking at how the results differ when using different divisions criteria (divisions 2, 3, 4 and 5).

4.4.1 Linear results

The results in table 4.5 refer to the general/combined group of self-employed and paid workers mentioned above and table 4.6 refers to our division of workers with the restrictions criteria. The estimated coefficients for the control variables used in the analysis are consistent with the expectations and are similar in most specification columns. The unemployment/inactivity experience is shown to decrease earnings in table 4.5 for the whole sample and this aligns with the Human Capital Theory and Human Capital depreciation. Women have significantly lower earnings, similar to those who are non-UK natives in both tables and in all specifications. As for those who consider themselves as disabled, the results differ in the OLS specification (S1) (found positive) and RE specifications (S4) (found negative) in both tables, which is counter-intuitive. Similarly, in the case of full time jobs, significant negative larger values are shown using the FE estimations (in S3) and RE models, and significant lower positive values when using the OLS and IV (in S2) methods, hence this tells us about the selection into full-time

work. For the language variable, significant positive values are shown in table 4.5 for the combined group of workers in the OLS and IV specification, and in table 4.6 for our division of workers, but are insignificant. The ethnic background variable does not have any significance presence in most specifications (only positive in the RE estimates for the general group of workers and significant at 10% significance level). Respondents who are either married or cohabiting and have children enjoy higher returns from those who have second jobs and are responsible for dependent child under the age of 16. As for our workers with employed partners, the results shown are insignificant in both tables and in all specifications.

The FE specification in column S3 in both tables is one of the preferred methods, followed by the IV specification in column S2 because it controls for the unobserved ability, including the self-employed ability and the extent which ability is time invariant for our group of workers in the sample. This is done by removing c_i from equation 4.4, thus the serial correlation in the error term is greatly reduced but not totally eliminated (Cameron and Trivedi, 2005 p:705). Also, the non-significance of the lambda coefficient in the FE model in both tables 4.5 and 4.6 suggests that the selection into occupational choice is controlled by the FE model. Whereas, the OLS, RE and IV estimates report significant positive values for the lambda coefficients in both tables suggesting a positive selection into employment on the basis of earnings.

4.4.1.1 Fixed Effects Estimates

The specification S3 shows that the FE model explains 29.2 percent of the variation in earnings returns in table 4.5 for our combined group of paid and self-employed workers and 30.7 percent in table 4.6 for our division of workers, which is considerably reasonable. Strangely, the years of education variable is not eliminated in both tables and the Fixed effect estimates show negative returns to earnings, with respect to its mean deviation. Hence this shows that we have a group of workers with varying years of education over the study. This is conceivable, since

we observe the same number of people for a consecutive twenty-three years, thus we would expect that some would acquire more years of education over the period of investigation.

The results in table 4.5 shows that for paid workers with changing years of education, the coefficient on the education variable is negative (1.9 percentage point decrease, significant at 99% confidence level). Similar results are also found in table 4.6 for the always employees (a negative 1.0 percentage point from the mean deviation, and significant at 90% confidence level). As for the returns to education for the self-employed, in general they are lower than paid workers (-0.7 percentage point difference) but insignificant. Whereas, opposite results are found for the case of sustained self-employed, with returns higher than the always employees (by 2.5 percentage points difference) but insignificant, and lower education returns for the dabbled self-employed (-4.8 percentage points difference), significant at 99% confidence level. The returns for dabblers are not only lower than the employees, they are strongly negative as their returns are approximately -6% (-0.010+(-0.048)) impact on wages per year; a 6 percent decrease in earnings). The lower returns for the dabblers are only found in the FE and RE models, where the FE changes in education are non-random, perhaps suggesting that this specific group of workers is responding to negative labour market experience and might reflect more than the value of the education itself.

We cannot draw any conclusion nor validate hypothesis 1 from the FE estimates between the differences in earnings returns for the sustained self-employed and always employees. As for the earnings returns between both subgroups of self-employed, we can partially support hypothesis 2, where the difference between the earnings returns for dabblers and sustainers is statistically significant. Although, the interaction of the years of education coefficient with sustainers is positive non-significant, the interaction with dabbler is negative significant and the difference between both groups is statically significant with p-values equal to 0.0018. Hence the earnings returns between sustainers and dabblers are statistically different.

Furthermore, we can fully support hypothesis 3, where the returns to additional years of education for the dabbled self-employed are significantly lower than the always employees, by 4.8 percentage points difference.

Time invariant variables like gender and ethnicity are eliminated in the FE model. Age is used as a proxy for experience and increases earnings at a diminishing rate in both tables. In table 4.5; workers who are married/cohabiting, and with children have higher returns, compared with non-UK natives, full timers, with second jobs, with partners employed, and responsible for dependent children under the age of 16. Similar findings are also shown in table 4.6 for our division of workers.

But the estimates in Specification S3 in both tables identify the marginal returns for only time-variant regressors and their deviation from the mean. Usually, education is considered as a time-invariant variable and is eliminated in the FE model. In our case, the analysis shows group of respondents with varying years of education over time (over the twenty-three years span). We conduct a separate analysis between respondents with years of education changing over time from those who don't. The estimates are found in the below table 4.7 for the combined group of self-employed and paid employed and table 4.8 for our division of workers. There are 19,819 out of 79,456 observations for the general self-employed and paid employees; around 25 percent of our sample, in which education is time variant and is not eliminated in the FE model. The same percentage is also found in table 4.8 for our group of sustainers, dabblers and the always employees (15,334 out of 53,936 observations have time varying years of education). But in both tables and in the two specifications used (FE model with time-invariant education and FE model with time variant education), the results entail similar stories with the signs and direction of coefficients for the control variables (other than the ones for the education variable) on the earning variable.

With the number of years of education varying between the observed 23 years, the analysis in table 4.7 shows that the self-employed in general have lower returns to additional years of schooling than the paid employees by 0.1 percentage point difference, but insignificant. Whereas, the results in table 4.8 differ between the two subgroups of self-employed. Sustainers have higher returns to additional years of schooling than the always employees by 2.9 percentage point difference, still insignificant, whereas dabblers have significantly lower returns than the always employees by 4.8 percentage point difference, at 5 percent significance level. Hence this shows that dabblers are getting much lower returns for the same years of education compared to the always employees, also in support of our hypothesis 3.

4.4.1.2 Random Effects Estimates

Concerning the RE estimates in the S4 specification in tables 4.5 and 4.6, the findings report positive returns for the combined/general group of paid workers and are in the range of 6.4 percent increase in earnings for additional years of education and similar percentages (6.5 percent) for the always employees, both significant at 99 percent confidence interval. The RE model explains 16.3 percent of the variations in the log earnings variable for our general group of self-employed and employees and 14.7 percent for our division of workers. These estimates are lower than the FE R-squared statistics, but still show similar pattern of results, insisting on the significant lower returns for additional years of education for our dabblers compared to the always employees, by 2 percentage point difference, at 99 percent confidence level. Different from the FE estimates, the RE estimates show lower returns for the sustained self-employed, by 0.6 percentage point difference, but with no significant values. Hence, we cannot draw any valid inference to back-up hypotheses 1 and 2, where the returns for the sustained self-employed are higher than the always employees and the dabbled self-employed. But there is

robust evidence for hypothesis 3 for the lower returns of dabbled self-employed in comparison to the always employees.

4.4.1.3 Ordinary Least Square Estimates

The specifications in column S1 in tables 4.5 and 4.6 refer to the pooled OLS estimates with standard errors robust to heterogeneity and clustered at individual level. The results explain 23.7 percent of the earnings variations for the combined group of workers, and 21.5 percent for the earnings variation in our division. However, they are potentially affected by the ability bias and are shown here for comparison only.

4.4.1.4 Specification Tests

The RE estimates are more reliable than the OLS specifications because the Breusch and Pagan Lagrangian multiplier test (see table 2 in appendix B) confirms the presence of the Random Effect in both cases (general self-employed and paid workers, and our division of workers) with p-values equal to 0.000. Whereas, the Hausman (1978) test (see table 3 in appendix B) in both cases shows that the difference is systematic between the FE and RE estimates (with Prob-Chi2 =0.000) and in favour for the FE model instead.

The Durbin-Wu-Hausman test for endogeneity (see table 4 in appendix B) in both cases concludes that the years of education variable is endogenous and there is a significant difference between the coefficients using the OLS and the IV models (p-values equal to 0.000). Also, the coefficient of λ_{it}which controls for the non-random selection into the working population is significant in all specification, except for the FE model. This shows that the problem of non-random selection into work is present in our dataset and based on unobservables, where we were unable to depict. For robustness check, we have removed the selection coefficients λ_{it} and rerun the analysis for our general group of workers and our division. The results are shown in the below tables 4.9 and 4.10 and are almost identical to the S3 FE specifications in tables 4.5 and 4.6. Hence, once the fixed unobservables are taken

account of, there is no relationship between unobservable determinants of employment and earnings, because the unobservable determinants of selection are time-invariant. This is why the selection term λ_{it} has no effect on the regression analysis for our preferred estimation model (the FE model).

4.4.1.5 Instrumental Variable Estimates

The S2 specifications in tables 4.5 and 4.6 account for the endogeneity of education using the Instrumental Variable method and the selection into employment (via lambda) but not the selection into self-employment based on time-invariant unobservables. However, this is less of an issue for dabblers as these workers are necessarily selective in employment and self-employment. We use fathers' education as instrument, a dummy variable indicating if respondents' fathers hold any educational degree as opposed to none to tackle the endogeneity problem of education. As explained in earlier sections, our reasoning is that educated fathers are more likely to induce their children to follow a similar path and acquire at least similar or even higher levels of educational qualifications. Thus, it has an indirect impact on wages through affecting children's years of education only. We also tried to include mothers' education as additional instrument, but the results showed to be weak, hence we did not report the estimates using the over identified IV model.

The point estimate from the IV regression in S2 in table 4.5 for paid employees (the reference group) is 15.3 percentage point increase in earnings returns for an additional year of schooling (highly significant at 1 percent significance level), almost doubled to the OLS estimates (6.9 percent) in table 4.5, which is reasonable and align with the range of estimates found in previous literature (e.g. Walker and Zhu (2001), Trostel, Walker and Woolley's (2001), Hoogerheid *et al*., (2012), and Fossen and Buttner (2013)) using parental education as instruments. Similar estimates are also presented in table 4.6 for the always employees, where the returns to extra year of education are 15.1 percent for this specific group (compared to 6.5

percent for the OLS estimates) and are highly significant at 1 percent significance level. The difference between the returns to education for the general self-employed and paid employees in table 4.5 based on the IV estimation are larger than the OLS estimation and with opposite signs. The self-employed earn 0.7 percentage point more than the paid employee, however the values are not significant. A similar case is found for our division, where the returns for both subgroups of self-employed are higher than the always employees (0.3 percentage point more for the sustained self-employed and 5 percentage points higher for the dabbled self-employed), but not statistically different, based on the cluster robust standard errors and are not consistent with the FE estimates as the confidence intervals do not overlap. Thus, we cannot fully support or draw any conclusion on the hypotheses 1, 2 and 3 using this method of estimation.

The first stage F statistics of the excluded instruments and Sheas partial R^2 are shown at the bottom of table 4.6 for our division of workers and for the general group of self-employed in table 4.5. Most of them report F statistics that are larger than or close to the rule of thumb value of 10 (Staiger and Stock, 1997). However, this relies heavily on the assumption of conditional homokedasticity of the error term. Stock and Yogo (2005) formalized Staiger and Stock (1997) procedure, where the tests can be used with multiple endogenous regressors and multiple instruments. They provide critical values that depend on the number of endogenous regressors, the number of instruments, the maximum bias and the estimation procedure. Hence the hypothesis of weak instruments is rejected if the statistics are larger than the critical values found in the SY stat table (a measure of the "strength of identification or the predictive power of the excluded instrument). The critical values in table 5 in appendix B for the combined group of self-employed and paid employees are larger (critical values equal to 16.87 for 10% maximal IV size, 9.93 for 15%, 7.54 for 20% and 6.28 for 25%) than the Stock and Yogo (2005 p:101) critical value table for weak instrument test based on the Two-Stage-Least-Square size (significance 5%, for n=2 and k=2, where n is the number of endogenous variables and k is

the number of instruments excluded, with critical values equal to 7.03 for 10% maximal IV size, 4.58 for 15%, 3.95 for 20% and 3.63 for 25%). Hence this rejects that the father education instrument and its interaction with the self-employed dummy are weak instruments. However, we were unable to obtain the critical values for the Stock and Yogo test for our division, but the Wald test based on the two-stage least square estimator rejects the null hypothesis of weak instrument, where the reported F statistics greatly exceed the critical values of the test statistics (see table 5 in appendix B). This suggests that the instrument used (fathers' education) is not weak.

There is also high correlation between the instruments used (father's education plus its interaction with the self-employed, the dabbled and sustained self-employed dummy variables) and the years of education variable (years of education plus its interaction with the self-employed, the dabbled and sustained self-employed dummy variables), suggesting that the instruments used are strong (see table 6 in appendix B). The first stage IV results in table 7a in appendix B show the impact of fathers' education on years of schooling and in table 7b the impact of fathers' education with the interaction with self-employed. The estimate of the first stage regression with the dependent variable years of education in table 7a reports a very high significant impact of fathers' education on years of schooling (coefficient is equal to 1.090 and significant at 1 percent significance level), but not very strong predictive power (the $R^2$and the adjusted R^2 from the first stage regression are around 11 percent). Whereas in table 7b the estimate for fathers' education and the interaction with self-employed dummy has a very strong predictive power (the $R^2$and the adjusted R^2 from the first stage regression are 95.09 percent) and a significant positive impact on the years of education and its interaction with the self-employed (coefficient is equal to 1.629 and significant at 1 percent significance level). Similar results are also shown in appendix B in tables 8a, 8b and 8c for our division. The estimate of the first stage regression in table 8a with the dependent variable years of education reports a

significant impact of fathers' education on years of schooling (coefficient is equal to 1.082 and significant at 1 percent significance level), but not very strong predictive power (the $R^2$and the adjusted R^2 from the first stage regression are around 8.8 percent). For the estimate for fathers' education and its interaction with the sustained self-employed dummy in table 8b the instrument is highly significant (coefficient is equal to 1.413 and significant at 1 percent significance level), with strong predictive power (the $R^2$and the adjusted R^2 from the first stage regression are equal to 95.17 percent), and similar case is also shown in table 8c for fathers' education and its interaction with the dabbled self-employed dummy (coefficient is equal to 0.900 and significant at 1 percent significance level, and the $R^2$and the adjusted R^2 from the first stage regression are equal to 94.96 percent).

However, the IV model only explains 9.2 percent of the variation of earnings for the general group of self-employed and paid workers, and 2.4 percent for our division of workers, suggesting loss of precision due to IV. We were not able to combine the IV and the FE methods as it requires transforming all variables into their mean deviations, and because the instruments used are time-invariant, based on fathers' qualifications (have a degree versus no degree). Hence the FE and IV estimators could not work in the panel context with the FE model and does not solve the issue of time-variant entrepreneurial ability. Hence, we rely only on our FE estimates that show lower earnings returns to years of schooling for the dabbled self-employed in comparison to always employees by 31.37 percent in relative terms, with the difference highly significant at 1 percent level.

4.4.2 Robustness checks

4.4.2.1 Non-Linear results

To gain further understanding of our results we consider the possibility that the returns to education are not constant over time and that the log of wages has a nonlinear function of years of education. Such nonlinearity may exist between the self-employed and paid employees and

among our division of workers. Hence, we repeat the analysis using only the OLS estimates as there are no instruments available for the extra education term. We include a quadratic term for years of education, along with its interaction with the self-employed dummy in table 4.11 and with the sustained self-employed and dabbled self-employed dummies in table 4.12.

The quadratic specifications in table 4.11 confirms the same findings found in table 4.5 of the OLS specification. The model explains 22 percent of the variations in the log wage regression. The analysis show that the general group of self-employed have lower returns than paid employees, but the percentages are negatively higher (-13.6 percentage points difference), and insignificant. The log wage estimates for the general group of employees are the percentage increase in earnings for an additional year of schooling and are 27.1 percentage point increase, significant at 1 percent significance level. In the quadratic model the predicted changes in hourly earnings when education increases by 1 year, from 11 to 12 years for employees is positive and equal to 2.64 percentage point significant increase in earnings. As for the general group of self-employed, the returns decrease when education increases by 1 year from 11 to 12 by 13.1 percentage point, but the values are insignificant.

The results in table 4.12 are also similar to the OLS estimation (S1) in table 4.6 for our division, however they are larger in numbers. The model explains 21.2 percent of the variation in the log earnings regression. The quadratic specifications show that the sustained self-employed have much lower returns than the always employees by 11.1 percentage point difference, as well as the dabbled self-employed by 8.1 percentage points difference, but the estimates are insignificant. Hence, we could not find any robust evidence in support of our three hypotheses (hypothesis 1(about the higher returns for sustainers compared to employees), hypothesis 2 (the lower returns of dabblers compared to sustainers), nor hypothesis 3 (the lower returns of dabblers compared to always employees)). In this model the predicted changes in hourly earnings when education increases from 11 to 12 years for the always employees are

exactly similar to the general group of paid workers in table 4.11 and equal to 2.64 percentage point significant increase in earnings. For sustainers, when education increases by 1 year from 11 and 12, the earnings returns decrease by 10.7 percentage point, and for dabblers by 7.8 percentage point decrease in earnings returns, both being insignificant. In addition, there is no evidence of nonlinearity in the differences between the general group of self-employed and paid employees and among our division of workers, because the interactions of education squared coefficient, with their respected dummy indication variables are jointly insignificant.

To explore possible nonlinearity further, we rerun the analysis using education levels (highest reported educational qualifications), while controlling for years of education. We check how the OLS estimates differ between our amalgamated group of workers in table 4.13 and for our division of workers in table 4.14. The educational dummies are split into 5 categories, using no qualifications as a reference category. We look at how the returns are rewarded differently between higher degree, A-levels, GCSE, other qualifications and missing values for qualifications. Strangely, the results found in both tables 4.13 and 4.14 are not consistent with the linear approximations estimated in the OLS regressions above and report larger standard errors. The results in table 4.13 show that the degree variable is significantly positive for the general group of self-employed (24.3 percentage point increase in earnings for self-employed holding a degree comparison to none), as well as the years of schooling (5.2 percentage point increase in earnings for additional years of schooling), both significant at 99 percent confidence level. Also, the general group of employees have significantly higher positive returns for their degree (43.4 percentage point increase in earnings returns for employees holding a degree in comparison to none and significant at 99 percent confidence level), and positive but lower earnings returns for years of schooling than the general group of self-employed (4.3 percentage point increase in earnings for additional years of schooling). Other qualifications compared to none have a significant impact on both workers but higher

for the self-employed than employees (significant 29.9 percentage point increase in earnings returns for the self-employed and 12.9 percentage point increase for wage earners, significant at 1 percent significant level). There are a few additional insights concerning our division of workers in table 4.14, where dabblers report the highest increase in earnings returns for holding an educational degree than sustainers and always employees. The earnings returns increase by 47.2 percentage point for dabblers, 43 percentage points for the always employees and 19.6 percentage points for sustainers, all significant at 1 percent significance level. In regard to A-levels compared to no qualification, the dabblers report higher significant increase in earnings returns than the always employees (47.2 percentage point increase for dabblers compared to 25.8 percentage point increase for the always employees), whereas no significant values are depicted for sustainers, and similar case is also shown for GCSE levels. Whereas, for other qualifications, sustainers report the highest increase in their earnings returns (27.8 percentage point increase), followed by dabblers (22.6 percentage points), and lastly by the always employees (12.5 percentage point increase), all significant at 1 percent significance level. Surprisingly, this is also the case for the years of schooling variable, where sustainers report the highest increase in earnings returns for additional years of schooling (4.7 percentage point), followed by the always employees (4 percentage points), and lastly for dabblers (3.6 percentage point), significant at 1 percent significance level. Hence, when controlling for educational qualification and years of schooling we find dabblers to have the highest increase in earnings returns for holding a degree, whereas for the years of schooling they show the lowest increase among our division of workers. Although our findings are intriguing and in line with our main hypotheses in regard to years of schooling, the OLS estimates are potentially affected by the ability bias. Hence, the results presented do not provide complete validation of the presence of the sheepskin effect in our study, as the estimated coefficients for the qualification variables

are not jointly significant for all our workers. Thus, we do not rely heavily on these estimates and are unable to find strong support of nonlinearity.

4.4.2.2 Different Division Criteria

Finally, to check the robustness of the results for our two subgroups of self-employed workers and the always employees, and to revalidate the use of our initial division criteria, we repeat the analysis using different division criteria to compare the results. Table 9 in appendix B provides the regressions results for the sustained and dabbled self-employed and always employees for division 2. Respectively, table 10 in appendix B for division 3, table 11 for division 4 and table 12 for division 5. The results in all four tables, using the preferred FE estimation model (S3) confirm with the initial findings of our division in table 4.6 and can only validate hypothesis 3, where dabblers have lower earnings returns to their years education than the always employees.

Table 4.5: *Main Earnings Regressions for Self-employed and Paid workers*

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.069***	0.153***	-0.019***	0.064***
	(0.002)	(0.010)	(0.005)	(0.002)
educ * self-employed	-0.001	0.007	-0.007	-0.003
	(0.008)	(0.026)	(0.008)	(0.007)
Self-employed	-0.251**	-0.365	0.000	-0.252**
	(0.095)	(0.333)	(.)	(0.085)
Age	0.044***	0.029***	0.102***	0.080***
	(0.003)	(0.004)	(0.003)	(0.002)
Age squarred	-0.000***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.166***	-0.177***	0.000	-0.150***
	(0.011)	(0.013)	(.)	(0.011)
Married/Cohabitting	0.028*	0.048**	0.054***	0.026*
	(0.014)	(0.017)	(0.011)	(0.010)
Partner employed	0.013	-0.000	-0.011	-0.002
	(0.011)	(0.013)	(0.007)	(0.008)
Full time job	0.071***	0.041**	-0.124***	-0.091***
	(0.011)	(0.013)	(0.009)	(0.009)
Has second paid job	-0.065***	-0.081***	-0.030***	-0.048***
	(0.012)	(0.014)	(0.008)	(0.008)
Has children	0.052***	0.038**	0.034***	0.037***
	(0.012)	(0.014)	(0.009)	(0.009)
Responsible for dependent child under 16	-0.044**	-0.048**	-0.108***	-0.088***
	(0.015)	(0.018)	(0.012)	(0.012)
considered disable	0.102***	0.009	-0.001	-0.009
	(0.012)	(0.016)	(0.010)	(0.008)
Non-UK native	-0.064*	-0.178***	-0.147***	-0.108***
	(0.028)	(0.036)	(0.012)	(0.028)
English first language	0.034*	0.047*	0.014	-0.022
	(0.016)	(0.018)	(0.085)	(0.017)
Non-white	0.023	-0.019	0.000	0.063*
	(0.040)	(0.049)	(.)	(0.031)
total numbers of waves in unemployment and inactivity	-0.022***	-0.015***	0.000	-0.042***
	(0.001)	(0.002)	(.)	(0.001)
λ	0.096***	0.057***	-0.000	0.028***
	(0.006)	(0.008)	(0.005)	(0.005)
Constant	0.092	-0.710***	-0.662***	-0.731***
	(0.052)	(0.112)	(0.107)	(0.049)
R^2 (overall model)	0.237	0.092	0.292	0.163
educ				
1st stage F statistic		146.426		
Shea`s Partial R^2		0.043		
educ * self-employed				
1st stage F statistic		41.9186		
Shea`s Partial R^2		0.0731		
person-year observations	79,456	79,456	79,456	79,456

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 4.6: *Main Earnings Regressions for Division 1, Sustained Self-employed, Dabbled Self-employed and Always employees.*

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.065***	0.153***	-0.010*	0.065***
	(0.003)	(0.015)	(0.005)	(0.003)
educ * sustainers	-0.004	0.003	0.027	-0.006
	(0.010)	(0.041)	(0.027)	(0.010)
educ * dabblers	-0.002	0.050	-0.048***	-0.020**
	(0.006)	(0.049)	(0.014)	(0.006)
sustained self-employed	-0.246*	-0.348	0.000	-0.379**
	(0.128)	(0.537)	(.)	(0.127)
dabbled self-employed	-0.008	-0.716	0.000	0.230**
	(0.074)	(0.647)	(.)	(0.086)
Age	0.060***	0.040***	0.109***	0.091***
	(0.004)	(0.006)	(0.003)	(0.003)
Age squarred	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.150***	-0.155***	0.000	-0.179***
	(0.014)	(0.017)	(.)	(0.015)
Married/Cohabitting	0.004	0.022	0.046***	0.018
	(0.018)	(0.022)	(0.013)	(0.013)
Partner employed	0.018	0.010	-0.006	0.002
	(0.015)	(0.017)	(0.009)	(0.010)
Full time job	0.076***	0.043*	-0.139***	-0.094***
	(0.015)	(0.019)	(0.013)	(0.012)
Has second paid job	-0.049***	-0.069***	-0.005	-0.021*
	(0.015)	(0.018)	(0.009)	(0.009)
Has children	0.070***	0.060***	0.031**	0.039***
	(0.014)	(0.017)	(0.010)	(0.010)
Responsible for dependent child under 16	-0.073***	-0.077***	-0.097***	-0.099***
	(0.019)	(0.023)	(0.014)	(0.014)
considered disable	0.112***	-0.020	-0.009	-0.029**
	(0.014)	(0.024)	(0.011)	(0.010)
Non-UK native	-0.082*	-0.222***	-0.153***	-0.092*
	(0.037)	(0.050)	(0.015)	(0.037)
English first language	0.016	0.033	-0.002	-0.043*
	(0.017)	(0.021)	(0.080)	(0.019)
Non-white	0.035	-0.048	0.000	0.037
	(0.057)	(0.075)	(.)	(0.038)
λ	0.092***	0.046***	-0.003	0.018**
	(0.008)	(0.010)	(0.006)	(0.006)
Constant	-0.162*	-0.911***	-0.695***	-0.952***
	(0.072)	(0.177)	(0.124)	(0.064)
R^2 (overall model)	0.215	0.024	0.307	0.147
educ				
1st stage F statistic		56.063		
Shea`s Partial R^2		0.037		
educ * sustainers				
1st stage F statistic		10.602		
Shea`s Partial R^2		0.055		
educ * dabblers				
1st stage F statistic		10.001		
Shea`s Partial R^2		0.0026		
person-year observations	53936	53936	53936	53936

Source: BHPS & UKHLS

*Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-*statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 4.7: *Fixed Effects estimates for Self-employed and Paid workers*

Specifications estimation methods	FE Education is time-invariant	FE Education varies
educ	0.000	-0.018***
	(.)	(0.005)
educ * self-employed	-0.022	-0.001
	(0.014)	(0.009)
self-employed	0.066	-0.279*
	(0.178)	(0.120)
Age	0.116***	0.098***
	(0.005)	(0.003)
Age squarred	-0.001***	-0.001***
	(0.000)	(0.000)
Female	0.000	0.000
	(.)	(.)
Married/Cohabitting	0.065**	0.050***
	(0.021)	(0.012)
Partner employed	-0.031*	-0.006
	(0.015)	(0.009)
Full time job	-0.147***	-0.119***
	(0.019)	(0.011)
Has second paid job	0.011	-0.042***
	(0.014)	(0.009)
Has children	0.042*	0.034***
	(0.018)	(0.010)
Responsible for dependent child under 16	-0.096***	-0.110***
	(0.024)	(0.014)
considered disable	-0.013	0.002
	(0.029)	(0.011)
Non-UK native	0.000	-0.146***
	(.)	(0.013)
English first language	0.000	0.015
	(.)	(0.085)
Non-white	0.000	0.000
	(.)	(.)
Total numbers of waves in unemployment and inactivity	0.000	0.000
	(.)	(.)
λ	0.002	-0.000
	(0.010)	(0.006)
Constant	-1.232***	-0.587***
	(0.100)	(0.113)
R^2 (overall model)	0.272	0.299
person-year observations	59,637	19,819

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level and λ is the selection *correction term.*

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.8: *Fixed Effect estimates for Division 1, Sustained Self-employed, Dabbled Self-employed and Always employees*

Specifications estimation methods	FE Education is time-invariant	FE Education varies
educ	0.000	-0.008
	(.)	(0.006)
educ * sustainers	0.000	0.029
	(.)	(0.027)
educ * dabblers	0.000	-0.048***
	(.)	(0.014)
sustained self-employed	0.000	0.000
	(.)	(.)
dabbled self-employed	0.000	0.000
	(.)	(.)
Age	0.118***	0.106***
	(0.006)	(0.004)
Age squarred	-0.001***	-0.001***
	(0.000)	(0.000)
Female	0.000	0.000
	(.)	(.)
Married/Cohabitting	0.049*	0.041**
	(0.025)	(0.016)
Partner employed	-0.033*	0.005
	(0.016)	(0.011)
Full time job	-0.163***	-0.131***
	(0.023)	(0.015)
Has second paid job	0.018	-0.013
	(0.016)	(0.011)
Has children	0.057**	0.025*
	(0.019)	(0.012)
Responsible for dependent child under 16	-0.105***	-0.094***
	(0.028)	(0.017)
considered disable	-0.006	-0.008
	(0.028)	(0.012)
Non-UK native	0.000	-0.149***
	(.)	(0.017)
English first language	0.000	-0.002
	(.)	(0.080)
Non-white	0.000	0.000
	(.)	(.)
λ	-0.003	-0.002
	(0.011)	(0.007)
Constant	-1.175***	-0.636***
	(0.117)	(0.137)
R^2 (overall model)	0.280	0.317
person-year observations	38,602	15,334

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustering at the individual level and λ is the *selection correction term.*

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.9: *Fixed Effects Earnings Regressions for Self-employed and Paid workers (with no selection term)*

Specifications estimation methods	(S1) FE no selection term
educ	-0.019***
	(0.005)
educ * self-employed	-0.007
	(0.008)
self-employed	-0.187
	(0.102)
Age	0.102***
	(0.003)
Age squarred	-0.001***
	(0.000)
Female	0.000
	(.)
Married/Cohabitting	0.054***
	(0.011)
Partner employed	-0.011
	(0.007)
Full time job	-0.124***
	(0.009)
Has second paid job	-0.030***
	(0.008)
Has children	0.034***
	(0.009)
Responsible for dependent child under 16	-0.108***
	(0.012)
considered disable	-0.001
	(0.010)
Non-UK native	-0.147***
	(0.012)
English first language	0.014
	(0.085)
Non-white	0.000
	(.)
Total numbers of waves in unemployment and inactivity	0.000
	(.)
Constant	-0.662***
	(0.106)
R^2 (overall model)	0.292
person-year observations	79,456

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level .

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.10: *Fixed Effect Earnings Regressions for Division 1, Sustained Self-employed, Dabbled Self-employed and Always employees (with no selection term)*

Specifications estimation methods	(S1) FE no selection term
educ	-0.011*
	(0.005)
educ * sustainers	0.027
	(0.027)
educ * dabblers	-0.048***
	(0.014)
sustained self-employed	0.000
	(.)
dabbled self-employed	0.000
	(.)
Age	0.109***
	(0.003)
Age squarred	-0.001***
	(0.000)
Female	0.000
	(.)
Married/Cohabitting	0.046***
	(0.013)
Partner employed	-0.006
	(0.009)
Full time job	-0.139***
	(0.013)
Has second paid job	-0.005
	(0.009)
Has children	0.031**
	(0.010)
Responsible for dependent child under 16	-0.097***
	(0.014)
considered disable	-0.009
	(0.011)
Non-UK native	-0.152***
	(0.015)
English first language	-0.002
	(0.080)
Non-white	0.000
	(.)
Constant	-0.690***
	(0.123)
R^2 (overall model)	0.307
person-year observations	53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level .

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.11: *Main Earnings Regressions for Self-employed and Paid workers (non-linear function of years of education)*

Specifications estimation methods	OLS
educ	0.271***
	(0.022)
educ * self-employed	-0.136
	(0.082)
self-employed	0.665
	(0.547)
education squared	-0.007***
	(0.001)
educ squared *self-employed	0.005
	(0.003)
Age	0.048***
	(0.003)
Age squarred	-0.000***
	(0.000)
Female	-0.189***
	(0.011)
Married/Cohabitting	0.020
	(0.014)
Partner employed	0.027*
	(0.012)
Full time job	0.092***
	(0.011)
Has second paid job	-0.053***
	(0.012)
Has children	0.064***
	(0.012)
Responsible for dependent child under 16	-0.059***
	(0.016)
considered disable	0.046*
	(0.022)
Non-UK native	-0.061*
	(0.029)
English first language	0.004
	(0.015)
Non-white	-0.010
	(0.040)
λ	0.095***
	(0.006)
Constant	-1.387***
	(0.152)
R^2 (overall model)	0.220
person-year observations	75,761

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustering at the individual level and λ is the selection correction term.

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.12: *Main Earnings Regressions for Division 1, Sustained Self-employed, Dabbled Self-employed and Always employees (non-linear function of years of education)*

Specifications estimation methods	OLS
educ	0.271***
	(0.030)
educ * sustainers	-0.111
	(0.096)
educ * dabblers	-0.081
	(0.063)
sustained self-employed	0.476
	(0.644)
dabbled self-employed	0.525
	(0.431)
education squared	-0.007***
	(0.001)
educ squared* sustainers	0.004
	(0.003)
educ squared* dabblers	0.003
	(0.002)
Age	0.060***
	(0.004)
Age squarred	-0.001***
	(0.000)
Female	-0.154***
	(0.014)
Married/Cohabitting	0.013
	(0.019)
Partner employed	0.015
	(0.015)
Full time job	0.072***
	(0.016)
Has second paid job	-0.047**
	(0.015)
Has children	0.065***
	(0.014)
Responsible for dependent child under 16	-0.078***
	(0.019)
considered disable	0.054
	(0.030)
Non-UK native	-0.080*
	(0.037)
English first language	0.015
	(0.017)
Non-white	0.039
	(0.056)
λ	0.077***
	(0.007)
Constant	-1.559***
	(0.214)
R^2 (overall model)	0.212
person-year observations	51,124

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustering at the individual level and λ is the selection correction

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.13: *Main Earnings Regressions for Self-employed and Paid workers (Educational Qualifications)*

Specifications	OLS	
	Self-employed	Employees
Degree	0.243***	0.434***
	(0.053)	(0.014)
A-levels	0.094	0.279***
	(0.061)	(0.016)
GCSE	0.057	0.196***
	(0.053)	(0.014)
Other Qualification	0.299***	0.129***
	(0.076)	(0.016)
Missing Qualification	0.112	0.296***
	(0.187)	(0.039)
Years of schooling	0.052***	0.043***
	(0.009)	(0.002)
Age	0.030*	0.051***
	(0.014)	(0.002)
Age squarred	-0.000	-0.000***
	(0.000)	(0.000)
Female	-0.276***	-0.164***
	(0.054)	(0.010)
Married/Cohabitting	0.103	0.004
	(0.061)	(0.013)
Partner employed	-0.004	0.030**
	(0.037)	(0.011)
Full time job	-0.499***	0.133***
	(0.047)	(0.010)
Has second paid job	-0.017	-0.075***
	(0.054)	(0.011)
Has children	0.019	0.085***
	(0.044)	(0.011)
Responsible for dependent child under 16	-0.075	-0.060***
	(0.065)	(0.015)
considered disable	0.135*	0.142***
	(0.056)	(0.012)
Non-UK native	-0.121	-0.051
	(0.100)	(0.027)
English first language	0.118	-0.038**
	(0.060)	(0.014)
Non-white	0.164	-0.064
	(0.150)	(0.035)
λ	0.121***	0.113***
	(0.035)	(0.006)
Constant	0.603*	-0.046
	(0.279)	(0.044)
R^2 (overall model)	0.113	0.33
person-year observations	8,003	71,453

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clusterd at the individual level and λ is the selection correction term.

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

Table 4.14: *Main Earnings Regressions for Division 1, Sustained Self-employed, Dabbled Self-employed and Always employees (Educational Qualifications)*

Specifications	Sustained self-employed	Dabbled self-employed	Always employees
Degree	0.196**	0.472***	0.430***
	(0.075)	(0.046)	(0.020)
A-levels	0.011	0.325***	0.258***
	(0.079)	(0.055)	(0.023)
GCSE	0.015	0.189***	0.186***
	(0.069)	(0.049)	(0.020)
Other Qualification	0.278**	0.226***	0.125***
	(0.090)	(0.055)	(0.024)
Missing Qualification	0.419*	0.509***	0.252***
	(0.164)	(0.132)	(0.054)
Years of schooling	0.047***	0.036***	0.040***
	(0.012)	(0.006)	(0.003)
Age	0.059**	0.059***	0.057***
	(0.018)	(0.010)	(0.003)
Age squarred	-0.001**	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Female	-0.247**	-0.152***	-0.132***
	(0.086)	(0.039)	(0.013)
Married/Cohabitting	0.109	0.012	-0.013
	(0.079)	(0.045)	(0.018)
Partner employed	-0.015	-0.011	0.025
	(0.046)	(0.031)	(0.016)
Full time job	-0.380***	-0.036	0.113***
	(0.072)	(0.035)	(0.015)
Has second paid job	0.059	-0.052	-0.091***
	(0.065)	(0.028)	(0.015)
Has children	-0.011	0.074*	0.091***
	(0.054)	(0.032)	(0.014)
Responsible for dependent child under 16	-0.108	-0.092	-0.070***
	(0.096)	(0.048)	(0.019)
considered disable	0.224**	0.128**	0.156***
	(0.071)	(0.040)	(0.015)
Non-UK native	-0.160	-0.034	-0.065
	(0.130)	(0.093)	(0.036)
English first language	0.171*	-0.004	-0.031*
	(0.067)	(0.061)	(0.016)
Non-white	0.178	0.063	-0.029
	(0.179)	(0.107)	(0.054)
λ	0.056	0.080***	0.102***
	(0.041)	(0.021)	(0.007)
Constant	-0.007	-0.074	-0.084
	(0.370)	(0.187)	(0.062)
R^2 (overall model)	0.101	0.229	0.333
person-year observations	5,248	8,986	39,702

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clusterd at the individual level and λ is the selection correction term.

* Significance of the coefficient at 10% level

** Significance of the coefficient at 5% level

*** Significance of the coefficient at 1% level

4.5 Conclusion

Our empirical results show that dabblers have lower earnings returns for their years of education than paid workers, although on average we see this group of workers reporting higher

number of years education than employees and the highest levels of educational attainments in our sample. Hence, they seem to suffer from some form of labour market disadvantage, when we consider their earnings returns to education and account for the selection in occupational choice and the endogeneity in education.

As for the sustained self-employed, we were not able to provide any robust evidence on the magnitude of their returns, nor validate our own hypotheses based on the extension of the personal control theory, because the estimates found were insignificant. Furthermore, we were unable to depict any differences in the earnings returns between the general group of self-employed and paid employees. Whereas, our division clearly showed that the two subgroups of self-employed are different from each other and from paid workers, with respect to their observed socio-economic and demographic characteristics and their earnings returns. Thus, when pooling the returns for these two subgroups of self-employed into one measure, the results provided do not yield the exact values on the earnings returns for the self-employed. This provides wrong interpretations for academics and gives misguided information for policy makers on the returns in self-employment.

Still, with the empirical work so far, we could not establish if dabblers are simply the younger version of the sustained self-employed and the lower returns are simply the start-ups pay before being founded in self-employment or are simply the consequence of their oscillating pattern. We hope to find further explanation on this, in the following empirical chapter of the thesis and look at the impact of recession on the transition behaviours of our group of workers.

Chapter 5: Flow and Transitions Prior and After the Economic Downturn

5.1 Introduction

Following up on the previous empirical work in chapters three and four of this thesis, we focus in this last empirical chapter on the onset of the 2008 financial crisis on our group of workers. We look at their transition behaviour prior to and after the economic downturn to provide insight on the effect of the crisis and the drivers of growth into self-employment. We observe the short-term, long-term trends and fluctuations in self-employment, the changes in the nature of jobs, and the demand and supply of workers in the market, the growth in self-employment in the UK labour market following the recession and the policies adapted as a response to the crisis. Our main aim is to find out if the transition behaviour of our division helps us explain the overall changes in growth in self-employment that occurred during recent years in the UK labour market, and if the recession (2008) impacted behaviours of our workers.

The analysis here is descriptive in nature and follows three approaches. In the first approach, we look at the transitions of all our respondents in the labour market throughout the observed years (years 1991 till 2014, missing year 2009), in which we study their flow in and out of self-employment and compare with the ONS findings. We also observe the stock of measure of our formed subgroups of self-employed (the sustained and the dabbled self-employed) and look at the way they do or do not behave the same in response to shocks in the labour market. We then re-categorise our division of workers for the years 1991 till 2002, and we observe their transition behaviour before the start of the recession, between the years 2003 and 2007. This constitutes somehow our 'counterfactual' flow, as what we would expect to happen in a situation when the labour market is booming. We then compare the findings with the second approach in this study, where we re-define the division criteria of our dabbled and sustained self-employed and the always employees for the years 1991 till 2007 and check how their transition behaviour changes after the crisis, between the years 2010 and 2014.

We chose to study the movement of workers between labour market states, especially for the self-employed between these two different periods of time (from 2003 to 2007, and from 2010 to 2014), for five consecutive years in a row to have a more objective assessment on business creation and success. The drawback in our study is that we have missing values for the year 2009, and for that reason we choose to exclude both years 2008 and 2009 during which the crisis occurred, as we are interested in examining the effect prior and after the economic downturn.

By doing so, we wish to gain a better insight into understanding the growth in self-employment in the UK, and the structural changes that occurred in the economy, especially regarding our division of workers. Our main attention focuses on the flow of dabbled self-employed and their responses to shocks in the labour market, because they have proven to be unique in their dabbling pattern, their socio-economic and demographics attributes and their returns to formal education. We may find that dabblers are simply younger versions of those who become sustained self-employed. In this way, one can see this work in line with Urwin and Buscha (2012) who use LFS data to analyse the 'entrepreneurial pipeline' (where do the self-employed come from?) and with the recent ONS (2014) studies on self-employment; which suggests that the rise in self-employment is maybe due to longer duration of workers in self-employment. We are also interested in looking at the persistence of the sustained self-employed in self-employment and their ability to overcome the challenges faced by the economic downturn, as this will convey to us if they are well embedded and established in self-employment.

On the other end, we may find that the dabbled self-employed workers control a sequential portfolio of working people, possibly making the most out of self-employment and paid employment jobs, when the time and conditions allow them to do so, or simply 'trying out both types of employment to see what best suit their skills. Potentially capturing this

contemporary form of work in a more refined way than a simple dichotomy between paid employment and self-employment, and linking our findings to the pull motives, the propensity pull hypothesis and the entrepreneurial pipeline.

We are also keen on exploring the deviations of wage earners during the economic downturn. Do we see any new up-coming trend from paid employment towards self-employment? Perhaps we may also witness a similar cycle-in and out behaviour among paid workers in self-employment. However, this might be a result of the undesirable effects of the crisis where we witness the rise of insecure, and temporary work among workers who concluded that is better to accept the insecurity in pay and work, rather than becoming unemployed. Nevertheless, we might also find that some workers, have opted out of work to remain in education and to ride out the economic downturn, while others became demotivated or retired.

This chapter proceeds as follows. Section 2 explores the trends of self-employment in the UK labour market, prior to and after the recession, the labour market policies, the changes in the job nature and in the demand and supply of labour, the effect of the 2008 financial crisis on the UK labour market with the up-to-date policies adapted as a response to the crisis and its impact on workers and on the economy. Section 3 describes and presents the different approaches used in this chapter. Section 4 reports and discusses the findings and section 5 provides a conclusion for this chapter.

5.2 Literature

5.2.1 Self-employment in the UK

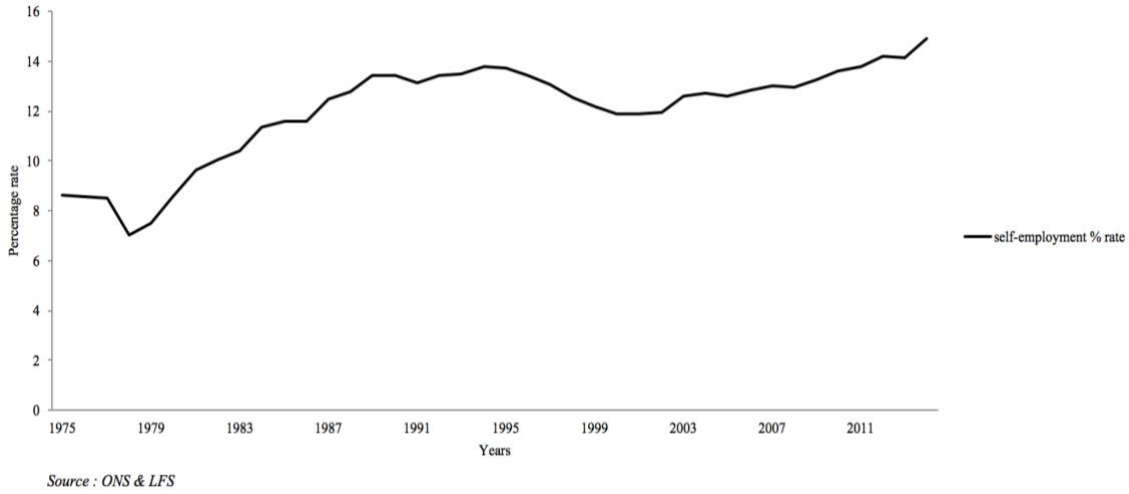
In the 1960s the UK started with a comparably low self-employment rate of 6 percent, increased to 8.5 percent in the mid 1970s, and experienced the largest rise among several OECD countries in the 1980s, to reach 13 percent (Taylor, 2004; Startienne and Remeikiene, 2008, 2009; Mickaitis *et al*., 2009; D'Arcy and Gardiner, 2014). The 1980s was described as

the decade for entrepreneurs during which Britain had the number of self-employed workers nearly doubled, from 1.8 million in 1979 to 3.4 million in 1989 (Meager, 1993, 1998, 2007; Meager and Bates, 2004; Taylor, 2004). Such fundamental increase was only attributed to the United Kingdom as opposed to other European countries, but despite the 11 percent peak in self-employment rates, it was still below the European Union countries average of 14 percent (Eardley and Corden, 1996). The figures continued to rise in 1996 to reach 13.8 percent of the labour force and account for at least one out of ten workers in the UK labour market (Blanchflower, 2000; Meager, 2007). This increase was not anticipated, and according to the Office of National Statistics (ONS), it was inconsistent with the economic conditions of the country, where self-employment rates "grew independently from the economic cycle" in the UK labour market (Meager and Bates, 2004 p:137; Lindsay and Macaulay, 2004; Meager, 2007 p:2). In the late 1990s and early 2000s these figures started to drop back, during which the period was characterised by a rapid growth of paid employment jobs (Lindsay and Macaulay, 2004). The statistics started to soar again during the years 2001 and 2003 at a faster pace as opposed to the initial increase during the late 1980s (Meager, 2007; D'Arcy and Gardiner, 2014). Then, the growth in self-employment became an international trend, particularly after the slow recovery from the 2008 financial crisis, where it reached its peak to 15 percent of total employment in 2014 (ONS, 2013, 2014).

Figure 5.1 below, extracted from the ONS and Labour Force Survey (LFS), between the years 1975 and 2014 confirms with the above findings showing an upward trend in self-employment percentage rates in the 1980s. Where the UK experienced a large increase in the proportion of self-employed to the total number of employees in the labour force. This was followed by a decrease in the late 1990s, a rise back since 2002, with a higher, predominant, and a continuous growth after the year 2008. This unanticipated growth in self-employment, after decades of declines and stagnations in the economy is striking, as the UK self-

employment rates continuously grew independently of the economic cycle and uncommonly from other Western European countries (Meager, 1998; Taylor, 2005; Hatfield, 2015).

Figure 5.1: Self-employment rates in the UK (1975-2014), ONS and LFS



Source : ONS & LFS

The total rise in complete employment since 2008 was predominant among the self-employed. Largely between the years 2008 and 2012, the number of self-employed workers rose because of their continuity in self-employment along with seeing an upcoming trend from newcomers. During that period, almost 650,000 new self-employed were added, allowing the total number to reach 4.5 million in 2012 and 4.6 million in 2014, accounting for nearly half of the increase in total employment since the recession (ONS, 2014; Deane, 2016). According to D'Archy, and Gardiner (2014), between the pre-and post-recession periods, around 72 percent of the increase in self-employment rates was attributed to the rise of newcomers, while the remainder was due to a decline in workers leaving self-employment. As such, UK self-employment rates fell at an almost equal rate to the European Union average of 15.2 percent, represented in table 5.1 below (D'Arcy and Gardiner, 2014 p:1; ONS, 2014). This latest increase in self-employment rates is considerably the highest at any point in time during the past four decades.

Table 5.1: *Self-employment rates for countries within the European Union in 2014 (*ranked from the highest to the lowest percentages*)*

EU 5 out of 28 Countries	*Percentage rate*
Greece	32.0
Italy	23.6
Romania	20.4
Portugal	20.1
Poland	18.4
Cyprus	17.5
Czech Republic	17.5
Spain	17.2
Ireland	16.9
Netherlands	16.1
Slovakia	15.5
United Kingdom	15.0
Croatia	14.5
Malta	13.6
Belgium	13.5
Finland	13.5
Slovenia	13.0
Bulgaria	11.6
Austria	11.3
Lithuania	11.2
France	10.9
Latvia	10.8
Germany	10.5
Hungary	10.5
Sweden	10.3
Estonia	9.4
Denmark	9.0
Luxembourg	8.1
European Union average rate	15.2

Source: Eurostat, European Labour Force Survey

As shown in the table above, self-employment rates tend to be high in Southern and Eastern Europe, and low in Western and Northern Europe (Hatfield, 2015). This can be explained by the prominence of agriculture and the service-based sectors, along with the informal work in these former countries, as self-employment is considered a route out of unemployment for states with poor labour market conditions (EEOR, 2010). According to the

figures of the ONS for the year 2014 in table 5.2, the UK had the third largest percentage rise in self-employment, after Slovenia and Estonia, across the EU. Whereas, these rates declined in Northern and Western Europe, in contrast to paid employment jobs that experienced a rise throughout the same period (Hatfield, 2015). These countries are characterised by strong and active labour market policies and having lower prevalence for the informal job market (Packard *et al*., 2012). The UK has been an exception to this cluster of countries, where self-employment accounts now for one in every seven persons in employment, reaching a higher level than those attributed to the 1990s peak (ONS, 2014, 2015).

This recent rise in self-employment rates in the UK was unique, being the only country from Western Europe where it significantly contributed to its labour market recovery (Hatfield, 2015). Following these trends, self-employment has become an important feature in the UK labour market, accounting for more than one third of the growth in employment since the late 2000s and reflecting the market capacity in the economy (Tatomir, 2015).

Table 5.2: *Self-employment rates for countries within the European Union between the years 2009 and 2014 (*percentage change over period, ranked from the highest to the lowest*)*

EU 28 Countries	*2009* *In persons (Thousands)*	*2014* *In persons (Thousands)*	*Change from 2009 to 2014* *In Percenatge*
Slovenia	95	116	22.8
Estonia	47	57	20.3
United Kingdom	3,828	4,549	18.8
Netherlands	1,137	1,325	16.5
Czech Republic	790	862	9.1
France	2,629	2,799	6.5
Lithuania	140	146	4.2
Luxembourg	19	20	4.2
Austria	452	466	3.3
Malta	23	24	3.0
Sweden	465	478	2.8
Latvia	93	95	1.6
Germany	4,210	4,237	0.6
Finland	322	324	0.7
Slovakia	361	362	0.2
Belgium	618	608	-1.7
Denmark	245	240	-2.0
Bulgaria	350	337	-3.7
Italy	5,434	5,234	-3.7
Poland	2,994	2,863	-4.4
Ireland	334	318	-4.5
Cyprus	66	63	-4.8
Spain	3,078	2,917	-5.2
Romania	1,823	1,710	-6.2
Hungary	465	427	-8.1
Greece	1,356	1,117	-17.7
Portugal	1,171	891	-23.9
Croatia	306	221	-27.7
European Union average rate	32,849	32,806	-0.1

Source: Eurostat, European Labour Force Survey

5.2.2 Policies

Government policies are important to consider when looking at self-employment transitions between workers (Zissimopoulos and Karoly, 2007), as the changes in self-employment over time are due to factors that are mainly attributed to changes in public policies like tax rates, pension schemes, social security benefits and start-ups policies (Blau, 1987; Schuetze, 2000; Bruce, 2002).

In the 1980s there was a great shift of focus for policy makers to promote "an enterprise culture" and to "allow self-employment and entrepreneurship to flourish", by increasing the inflows into self-employment and facilitating new business formation (Cowling and Mitchell, 1997 p:427; Parker, 2004 p:105). In 1981, the Loan Guarantee Scheme was set up by the government to help guarantee 80 percent of loans up to £100,000, hence removing the collateral constraints for new business owners and existing small firms, followed by the introduction of the Enterprise Allowance Scheme in 1983 to help encourage the unemployed to set up their own businesses. This was done by providing each person with a sum of £40 and up to £100 of weekly allowance, in their first year in self-employment (Cowling and Mitchell, 1997 p:428). Consequently, both schemes were proven to be efficient in increasing the inflow of workers entering self-employment from the beginning of the 1980s till the mid 1990s (Cowling and Mitchell, 1997; ONS, 2014). In parallel, the market experienced a large shift from manufacturing to service-led employment, and an increase in the banking, finance and service sectors, construction, education, health and public administrative industries (Lindsay and Macaulay, 2004).

Several academics linked this sudden increase to the election of the Thatcher Government in 1979 and the adoption of the New Enterprise Allowance Scheme that targeted and encouraged self-employment activities, by offering financial support to the unemployed and others wanting to become self-employed (Meager, 1996; Taylor, 2004; D'Archy and Gardiner, 2014). However, evidence on the implemented governmental policies in the 1980s concluded that these strategies were efficient in increasing the inflow into self-employment but didn't stop the increase of outflow (Martinez-Granado, 2002). No single factor could explain the sudden and unusual increase in UK self-employment growth during the 1980s, but all arguments were linked to the government policies adapted that encouraged the start-up of new

businesses and helped the unemployed to become self-employed (Acs *et al*., 1992; Meager, 1993, 1996; Meager and Bates, 2004; Taylor (2004) for evidence from the LFS).

A more detailed analysis tends to invalidate the view of the 1980s' "British entrepreneurial spirit" renaissance (Parker, 2004 p:105). Blanchflower and Oswald (1990), using the British Social Attitude Survey, found that the proportion of employed respondents who were thinking of becoming self-employed did not change between the years 1983 and 1989. Also, Blanchflower and Freeman (1994) questioned the effect of "enterprise culture" as only the transitions from unemployment and inactivity into self-employment increased during the 1980s and not from paid employment. Both studies claimed that only the changes in the personal characteristics and the favourable development in the macroeconomic environment could explain the rise in self-employment rates in the UK.

In the 1990s there was a slight fall in self-employment rates due to recession, where inflow rates and outflow rates were relatively high, especially among the long term unemployed, with flows of people leaving self-employment growing faster, between the years 1996 and 2001 (Bryson and White, 1996; Cowling and Mitchell, 1997; Weir, 2003; Meager, 2007). Self-employment percentage rates began declining, as many self-employed workers switched to paid employment, due to changes in the tax revenue. The 1996 Inland Revenue Initiative targeted and pushed workers away from self-employment into paid employment, along with the actions taken by legal authorities to try to eliminate the bogus self-employed in the construction sector (Green, 1998; Briscoe *et al*., 2000; Knight and Mckay, 2000; Weir, 2003; Meager, 2007; ONS, 2014). Policy makers raised a big concern on the extent which the self-employed were engaging in worse terms and conditions than employees, and the risks of being exploited by employers seeking to reduce their costs and social obligations (Parker, 2004). This period was also characterised by a decline among the self-employed who specialise

in craftsmanship and related occupations, and a notable fall in managerial self-employment (Meager, 2007).

On the other hand, government schemes and stimulating supportive policies were established to promote entrepreneurial activities "as a way out of unemployment" (Block and Sandner, 2009 p:2), by assisting the underprivileged, like the unemployed living off their benefits, workers at risk of losing their jobs, and individuals outside the labour force who were unable to secure paid work (Meager, 1996; Carrasco, 1999; Taylor, 2004; Bergmann and Sternberg, 2007; Urwin and Buscha, 2012; D'Arcy and Gardiner, 2014). Such policies aimed to support these individuals to set up new businesses by facilitating their financial accesses and helping them develop new and essential skills that allow them to sustain in this type of job market (Carrasco, 1999). Hence, self-employment rates started to rise back at the beginning of 2000, further increased in 2011 and onwards when the New Enterprise Allowance Scheme, the welfare reforms, the work program, the benefit cap and the Business Start-up Scheme for young entrepreneurs were introduced by the government (D'Arcy and Gardiner, 2014; ONS, 2014). This was done by issuing loans, weekly allowance, providing mentoring support and help for self-employed workers in the labour market. These policies aimed to complement a long-term structural change in the UK labour market by promoting higher demands for entrepreneurial activities. But much of the existing support focused on the long-term unemployed rather than workers with entrepreneurial insight (Urwin and Buscha, 2012), as in the case of Germany, where the state used its funds to promote all types of business start-ups (like the State-Owned Bank SME, KFW Mittel-Standsbank). This was evident with the federal employment agencies (Bundes-agentur fur Arbeit) that focused on helping the unemployed to become self-employed, supporting necessity entrepreneurs and not opportunity entrepreneurs (Meager, 1996; Bergmann and Sternberg, 2007, Block and Wagner, 2010). In the US, the rate of necessity entrepreneurs increased by 8 percent, between the years 2007 and 2009, then decreased back

by 3.5 percent and in European countries the numbers reached much higher levels (Kelley, Singer and Herrington, 2011).

The UK adapted similar schemes to promote self-employment activities, especially among the youth (Meager *et al*., 2003). This type of government policies has been popular lately because of the effect of the 2008 financial crisis, whereby the government promoted entrepreneurship as a way out of unemployment, especially among young workers (Greene, 2013). But these schemes could quickly fail as the set-up of businesses by unemployed and inexperienced workers do not last long in the market (Meager, 1996). The policies would only be delaying the transition into unemployment and "encouraging the launch of poorly functioned and ill prepared businesses" that would not survive in the market for a long period of time (Dawson *et al*., 2009 p:3-4).

Additional policy initiatives were introduced by the British government towards encouraging entrepreneurship, like the extension of the 10 percent entrepreneurial tax relief rate, the introduction of the Enterprise Finance Guarantee Scheme and the New Enterprise Allowance to support the self-employed rather than paid employees (Hatfield, 2015 p:11), making self-employment a more appealing prospect to workers and policy makers in the UK. However, Macaulay and Lindsay (2004), using the LFS in the early years 2000s, found no empirical evidence that the changes in the tax system could explain the increase in self-employment rate during that period.

Still, there is limited access for training and development for the self-employed in the UK. Only very few receive taught learning activities in comparison with other European countries, like Sweden, which has adopted several measures to foster entrepreneurship among the disadvantaged groups of workers (like women and immigrants) (Hatfield, 2015). This has been done by providing advisory services, training and mentoring programs, along with individually tailored guidance for individuals with language difficulties and non-native

speakers who would like to set up their own work (EEOR, 2010). Thus, for the newly established self-employed to sustain in the job market, they must be equipped with the appropriate training skills and linked to certain levels of innovations to guarantee business continuity. The unemployed and the misfit workers must have access to the appropriate advice; the necessary training programs and the financial resources to help them survive in self-employment (Cowling and Mitchel, 1997; Hatfield, 2015).

Parallel to that, barriers were enforced to limit small start-up firms to grow and to take on new staff (Urwin, 2011). This is done by exerting additional costs, like the rise in the cost of the National Insurance Contributions (NICs), the increase in the Product Market Regulation (PMR), the extension of the Employment Protection Legislation (EPL), the heavily charged complying tax system for new start-ups firms, combined with the large burden from existing regulation and the surge in the administrative reporting work for the self-employed set by the introduction of the Universal Credit (UC) (Nicoletti and Scarpetta, 1999; Lindsay and Macaulay, 2004; Redston, 2004; Cahuc and Koeniger, 2007; Meager, 2007; Chittenden *et al*., 2010; Urwin, 2011; Urwin and Buscha, 2012; ONS, 2014). As such, the UK stands out across Europe as the country with the lowest percentage of self-employed who employ staff (17 percent), through which small businesses are being squeezed out of the market (Urwin, 2011; Hatfield, 2015 p:12; Deane, 2016).

But the UK ranking for the ease of starting-up a business has reached higher ranks over previous years (ranked from 50 in 2014 to 45 in 2015) (World Bank Group, 2015), implying fewer difficulties for workers to set up their own businesses and better developed regulations to make self-employment a more prevailing option. This is because of the highly-deregulated structure for capital ownership by which the UK market was and still is characterised (Cowling and Mitchell, 1997). This allowed a rapid growth in home ownership, with fast growing housing price inflation and easing of equity withdrawals. All facilitating the rise of financial

capitals and increasing the flexibility and ease to establish new businesses (Meager, Kaiser and Dietrich, 1992; Taylor, 1996; Blanchflower *et al.*, 2003; Meager, 2007). It is also due to the favourable UK tax system for the self-employed, with the changes in the reform capital gain tax, the reduction rate for cooperation taxes for small companies, the liberal regulatory regime, and the deregulated capital markets (Crawford and Freedman, 2010).

Except, the main potential barrier for business start-ups is the access to finance (OECD, 2009; Urwin, 2011 p:61). Looking at the supply and demand side for funding for small businesses and self-employed, bank loans are considered an important source of capital for most UK businesses, and to some are the only access to finance (Cosh and Hughes, 2003; Roper *et al*., 2006). Yet, with the financial crisis being the main contributor to loss of confidence in the market, many risk-averse financial institutions became hesitant to lend monies to small or start-up businesses. This is due to the perceived risk and the high rates of failure associated with self-employment, along with banks' objective to improve their lending portfolio image (Urwin, 2011). This has been a potential strain for Small Medium Enterprises growth and contributed to 54 percent of its volume fall. Where the lending practices continued to be low, even with the introduction of the "Funding-For-Lending" Scheme in 2012 by the Treasury and Bank of England, offering funds to banks in an aim to boost credit in the real economy (OECD, 2009 p:49; Small-Business Lending, 2015 p:34). The core problem with the low numbers of lending arises with the risk-scoring methods used by these organisations, relying only on the defaults of banks and insurance sectors, while not being able to make accurate predictions and models to estimate correctly the self-employed business success and failure (Aker, 2004; Parnitzke, 2005; Kraft *et al.,* 2002). Thus, the main indicators for such expectations are mostly based on unobservable characteristics which the academic literature is still experiencing difficulties in distinguishing (Urwin, 2011).

From what is described above, the sets of existing policies do not help expose the real motives and reasons behind why people choose to engage in self-employment. This is especially a concerning matter when looking at the UK economy, which is characterised by its unusual structure, that favours self-employment entry on one side and limits its growth on the other (Meager, 2007). Thus, this creates debates on the implication of the high levels of self-employment rates in the UK economy, since the triggers to enter such occupations are still ambiguous. A report from the department of Business Innovation and Skills (2016) highlighted the present need to gain a better understanding of the self-employed, especially after their outgrowing number. And the urge to review policy aims to benefit all members in self-employment, along with providing self-employed workers with support, especially in areas where there is discrepancy with the aids and rights offered to support paid employees (BIS, 2016). However, the complex nature of self-employment poses considerable challenges for the development of efficient economic policy measures (Simoes and Crespo, 2015).

Hence, in this chapter we aim to study the transition behaviours of the self-employed workers, and observe their inflow and outflow rates in self-employment, prior to and after the economic downturn to have a better understanding on the effect of economic and external factors, along with studying the effect of individual attributes and earnings returns on workers' movement especially within self-employment.

5.2.3 Changes in demand and supply of workers, in nature of work and the Gig economy.

5.2.3.1 Changes in the supply and demand of workers

Aside from policies, changes occurred in the demand and the supply side of labourers, workers have increased their propensity to contract out, and firms have changed their fragmentation strategies by decreasing their reliance on sole suppliers and starting to benefit from a wider array of smaller dealers and flexible workforce (Meager, 2007; Mickaitis *et al*., 2009), as this helps enhance the work processes within businesses. This caused an increase in the outsourcing

between large firms and employees, for those whom we consider as freelancers or self-employed without employees (Urwin and Buscha, 2012). Correspondingly, the growth in self-employment mainly occurred in the construction sector due to the increase in the franchising and privatisation of public services, and in the sub-contracting, by which self-employment was denoted as "disguised wage employment" (Winch, 1998; Nisbet and Thomas, 2000; Meager, 2007).

Recently, there have been changes in the attitudes towards people starting their own jobs, where self-employment is perceived as a more fashionable state than paid employment and a route to fulfil one's own dreams (Urwin, 2011). Also, self-employment is being viewed as an alternative to retirement, with workers entering self-employment after the recession being older and more qualified than their predecessors (D'Arcy and Gardiner, 2014; Nevin, 2017). What is more, it is becoming more common for younger workers, since the number of workers who have paid jobs has fallen since the year 2000 (Nevin, 2017).

5.2.3.2 The Gig economy

Nevertheless, the digital era changed Britain's labour market radically, by changing employment relationships, shifting away from business organisations that make employees to new types of companies that directly link customers with specific service providers, on so called "on-demand economy or sharing economy" (Todoli'-Signes, 2017, p:194). This level of outsourcing would not be possible without the presence of technology, where these high-tech businesses rely on their online platforms to allow clients to directly find workers to perform the requested jobs. This makes it easier for workers to access paid work and to connect to people who want the tasks to be done with people who are doing the work. These platform-owning companies classify workers as independent workers or self-employed and this new specific business model has been termed as the Gig economy (Todoli'-Signes, 2017).

The gig economy has made it very easy to control when, where and how much workers choose to work (Nevin, 2017). The flexible nature of the gig economy does not only benefit the workers, but also employers as they only pay when the job is done, and do not incur staff costs. These changes in the work nature boost growth and deliver more opportunities for both workers and consumers. But on the other hand, they are aligned with less job security in the market. There is a concern that these new types of businesses might be initiated to escape from employment laws and paying off social security contribution especially in concern to minimum wage and collective wage agreement (De Stefano, 2016).

5.2.3.2.1 Critiques of the Gig economy

Many arguments were against the classification of gig workers as self-employed, as companies who own these online platforms impose rules and monitor workers, in return workers provide their labour without adding any special value to the job nor possibility of entrepreneurial development (Sprage, 2015; Roger, 2015, p:5; Todoli'-Signes, 2017, p:200). However, they have more flexibility in terms of working hours, schedule and the way how and where they perform their tasks. According to the Resolution Foundation (2017) presentation, the gig jobs that have seen the highest rates of growth over the last decade are in the wage sector, especially in administrative position, banking sector and advertising. Cherry (2009, 2016) argued that the only reason why these workers are not classified as employees is because of the misunderstanding and the novelty of the digital world, where it is very difficult to implement all existing employment laws on this new business model. Yet, out of the 3 million people who found new jobs since 2008, 45 percent were classified as self-employed (Nevin, 2017). The rise in self-employment along with the public profile of these new companies in the gig economy has initiated some debates about whether the distinction between self-employment and employment is clear and whether employment practices and regulations are keeping track on the changing nature of work (Mian, 2016; Nevin, 2017). There is a perception that this

distinction is letting firms take advantage between these two statuses and obtain tax or regulatory advantages.

The opinion on the gig economy seems to be polarised, on one end it is claimed as the new world of flexibility, choices and pattern of work. On the other end, gig workers are seen to be poorly paid, have insecure jobs, degrading working conditions, and do not add great value to the economy (Wong, 2017). The UK Leadership Institute suggests an hourglass characterisation of workers in the gig economy, where on the top it compromises with the highly skilled workers that are relatively well paid and indeed expect work flexibility. Whereas, at the bottom end of the hour glass we have temporary, part-time, fixed term zero-hour contracts which are insecure and low paid (Wong, 2017). Research from CIPD (2017) estimated that 1.3 million of UK working adults are in the gig economy, with 14 percent being self-employed because they are unable to find traditional employment and nearly two-thirds of them believe that the government should regulate to guarantee basic employment rights and benefits (Wong, 2017 p:8).

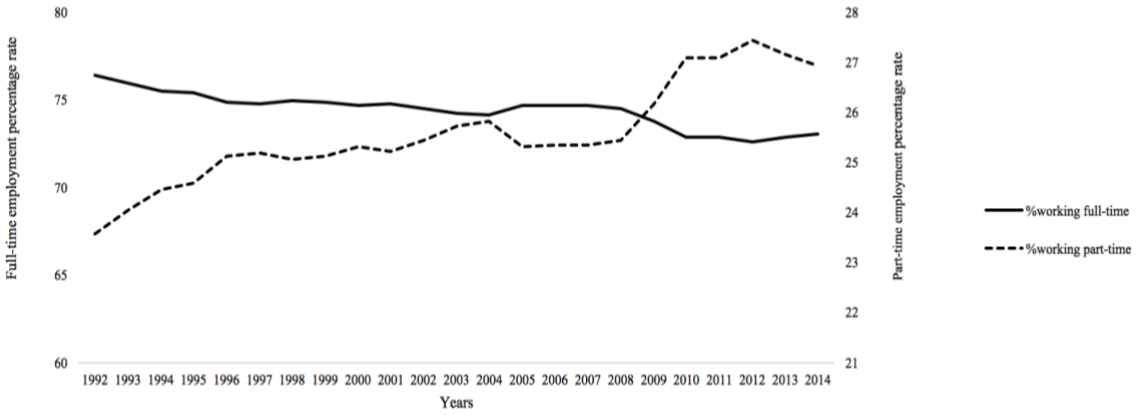
5.2.3.3 Changes in Nature of work (full-time and part-time jobs and precarious work)

On another note, full time and stable job contracts are now fewer than one in four jobs and the statistics are not improving (ILO, 2015). Figure 5.2 below from the ONS confirms the above statement, showing a downward trend in full-time employment percentage rates throughout the years (started with 78 percent of workers in full-time employment in year 1992, gradually decreased by 3 percent at the beginning of year 2000, rose back to 75 percent in year 2007 prior to the economic crisis, and fell to 73 percent from years 2008 till 2012). Where the fall in full-time jobs was opposed by the rise in part-time jobs (as shown in figure 5.2, on the right y axis, where there is a continuous upward trend in part-time employment percentage rate from 24 percent in year 1992, up to 27.5 percent in year 2012, with the predominant upswing during the economic crisis). But, the rise in part-time at the expense of full-time work can reflect that

employment may have been somehow protected by greater adjustment in hours worked than in previous recessions (Gregg and Wadswirth, 2010, p:36)

Continuation of past trends from the World Employment Social outlook (2015) suggests that the incidence of stable employment relationships will present even smaller fractions of total number of jobs in the coming years. Thus, this changing pattern of work is more likely to influence trends in aggregate demand, economic growth, employment and productivity that lead to a vicious circle of weak global demand and slow job creation.

Figure 5.2: Total Employment, Full-time and Part-time percentage rates in the UK (years 1992-2014) ONS



Source : ONS

Indeed, there is an increase in the diversification in forms of works, and workplace organisation but not many considerations have been given to the quality of jobs, or workers' income security. There is a shift from the standard employment model, where workers earn a wage and have a stable job, to short term contracts and irregular hours. Waged jobs have been on a downward trend, whereas own work and other forms of jobs outside the scope of the traditional employer-employee relationship are on the rise. In addition, fewer than 45 percent of waged employees are employed on a full time and permanent basis, and this share appears

to be declining (ILO, 2015). This suggests that the rise of precarious employment is associated with unstable and insecure employment conditions, and workers lacking social protection and full employment rights comparable to those who are in stable employment (Kalleberg, 2009, 2011).

The literature on the rise of precarious employment provides a variety of theories and different explanations, mostly related to demographic changes, education, skills, the job and work characteristics along with the institutional changes (Brady and Bierget, 2017). Where there are certain characteristics, especially for workers who carry demographic vulnerability that are closely aligned with precarious employment like, immigrants, marital status, family structure (single mothers) and age (Kalleberg, 2009, 2011; Brady *et al*., 2010).

New labour market entrants also face many challenges because of their lack of experience and weak bargaining power and as a result, temporary contracts are offered to young workers (Kahn, 2007). On the other hand, older workers who have been already established in their work exert additional pressure on the new labour market entrants and worsen their bargaining position.

Other than that, the rise in precarious employment can be caused by the changes in education and skills with the mismatch between workers' education composition (the labour supply) and the skills requirement of the labour market (the labour demand) (Kalleberg, 2007). Where the proportion of university graduates has proportionally increased in the UK, by almost 40 percent, between the years 1991-2008 (Oppedisano, 2012 p:205). Educational expansion provides more skilled workforce, but the larger share of highly educated workers increases the pressure of low educated workers to take on precarious jobs (Gebel and Pfeiffer, 2010). Because "The increasing demand for higher education reduces the supply and changes the composition of unskilled, secondary school graduates, and may therefore affect the labour market outcomes" (Oppedisano, 2014 p:205). This is also highlighted by the skill-biased

technological change that was associated with new computer technologies, where it increased the demand of skilled workers but also lowered the demand for low education workers (Acemoglu and Autor 2011; Card and DiNardo 2002).

The literature documents a separation between high skilled and low skilled jobs in precarious jobs and one of the result of the shift is the rise of these unstable jobs (Goos and Manning 2007; Goos *et al*., 2009; Oesch and Rodriguez Menes, 2011). Hence with this issue covered it is worth noting that the medium skilled workers are the ones mostly affected and have seen the largest drop in work (Brady and Bierget, 2017 p:13).

Also, the job and work characteristics can explain the rise in precarious jobs (Kalleberg, 2009, 2011). Over recent decades, there has been a decline in occupations characterised by stability and "standard" employment while there has been a growth in disproportional and low-wage jobs (Eichhorst *et al*., 2015). Hence, the rise of precarious employment could be the consequence of broader long-term changes in occupations, industries and work (Brady and Bierget, 2017 p:13). Another explanation is that the rise of precarious employment is focused on institutional changes, by rules, laws and political parties (Campbel, 2004; Fligstein, 2001; Pierson, 2004). These channels constrain and regulate the behaviour and define the actions of firms and workers (Fligstein, 2001).

As a response to all of the above stated, the government acted on the changing pattern of work by adapting and extending the reach of employment regulations. There has been a significant improvement in the areas of legislation regarding self-employment, part-time work, fixed term employment and agency work. Still, the insufficient legal framework does not fully reflect the nature of jobs in the market. Hence, there is a clear need for carefully designed approaches based on specific labour market conditions and outcomes (Brady and Bierget, 2017 p:27).

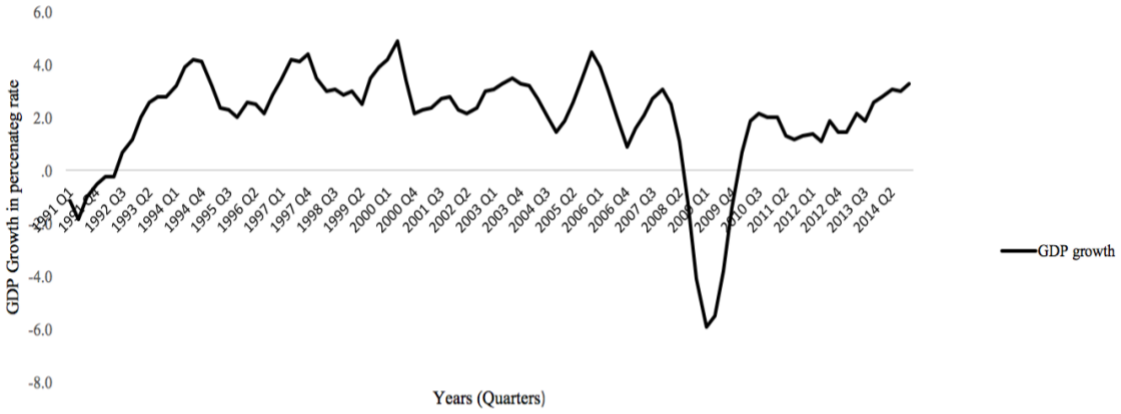
We acknowledge that the changes in the supply and demand of workers, along with changes in the nature and structure of work, are not necessarily caused by the onset of the 2008 financial crisis and are the result of long term structural changes. We believe that the advantage of our datasets (the BHPS and the UKHLS) allows us to observe and to follow the same people for over twenty-three consecutive years (from years 1991 till 2014, year 2009 missing). This gives us better insight on the changes that occurred in the labour market, especially with regards to our division of workers, and helps us capture the effect of the long-term trend.

5.2.4 The 2008 Financial Crisis

5.2.4.1 GDP

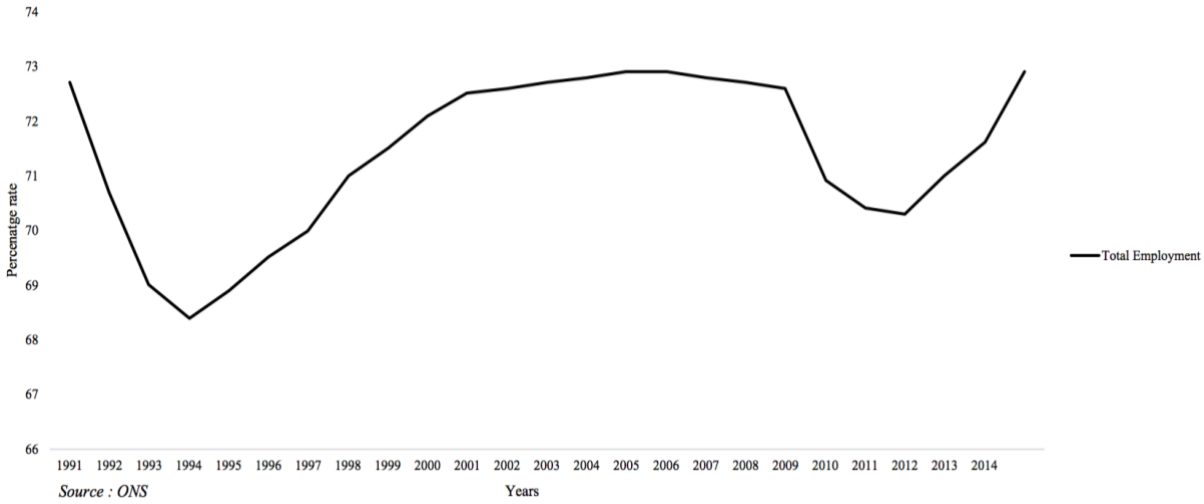
The 2008 financial crisis was the deepest in several decades, it started in the second quarter of 2008, where GDP fell over 6 percent, for over six successive quarters and was far worse than the recessions of the 1980s and 1990s (Jenkin, 2010; Gregg and Wadsworth, 2010). In the previous two, the employment fall was larger than the GDP fall and was only halted 12 to 14 quarters after the recession. The picture of this latest crisis has been striking, GDP has fallen remarkably worse and this is shown in the below figure 5.3 from the ONS. The fall in GDP growth started in the first quarter of year 2008 from 2 percent to null by the beginning of 2009 and then had dramatically fallen further to reach a negative 6 percent in the last quarter of year 2009. However, the sharp decline in GDP growth during the economic downturn was counter-faced by a much more stable and smaller fall in employment levels, just 2 percent from the pre-recession levels. This is shown in the below figure 5.4 from the ONS (from 72 percent in 2008 to 70 percent in 2012).

Figure 5.3: GDP Growth in the UK labour markets, years (1991Q1-2014Q2) ONS



Source: ONS

Figure 5.4: Total employment growth in the UK labour market, years (1991-2014) ONS



Source : ONS

Before the economic downturn, the UK had a comparably strong growth in real GDP, and the highest among the G7 economies (Canada, France, Germany, Italy, Japan, UK and US), and the OECD averages (Jowett *et al*., 2014). Following the crisis (between mid 2008 and 2009), the UK growth in the period of the recession had been slower than other major economies and lower than that of the OECD total. The depth of the UK downturn combined with the slow growth since recovery has resulted in the UK lagging behind many economies in returns to its pre-downturn peak (Jowett *et al*., 2014).

The recessions in the early 1980s and 1990s resulted from the contraction of the monetary policy, trying to bring down inflation. With respect to the latest recession, inflation remained at low levels and monetary policy has been loosened. Instead the recent crisis reflected the fall in the credit cycle and the accessibility to finance (Jenkin, 2010 p:36). For many, the global financial crisis was something beyond prediction, and most people never imagined it coming. It was beyond the ability of regulators to foresee such a decline, however there were clear signs and only matter of time for it to happen (FCIC, 2011 p:3).

5.2.4.2 Unemployment levels

Unemployment rates increased by 2.6 percentage point to reach 7.8 percent, equal to 2.46 million unemployed. Even so, it continued to rise after GDP started to increase, but it appears to have stabilised a lot faster than in previous recessions (Jenkin, 2010 p:36). Prior to the crisis, there has been a steady decline in unemployed workers from 3.02 million in 1993 to just 1.4 million in 2006. The numbers picked up slightly in April 2008 to 1.6 million because of the tightening credit conditions of firms and households, accompanied with the collapse of Northern Rock and other building societies that led the economy into steep recession (Jenkin, 2010). In the second quarter of 2008, there were 1.47 million unemployed and by October 2011 the numbers reached 2.68 million, then declined to 2.33 million in the mid of 2014. In comparison with other advanced economies, the UK entered the crisis with comparable level of unemployment rates 5.1 percent in the first quarter of 2008 to reach a substantial peak in last quarter of 2011 8.3 percent, a larger increase than most G7 countries, but not more than the US (Coulter, 2016; Fragouli and Giannakovitis, 2017).

5.2.4.3 Inactivity rates

Inactivity rates did not fluctuate as much as employment and unemployment. It has been low at 19.3 percent and high at 23.3 percent between the first quarter of 2008 and the last quarter of 2011. Before the recession, there were 7.86 million individuals out of the labour force and

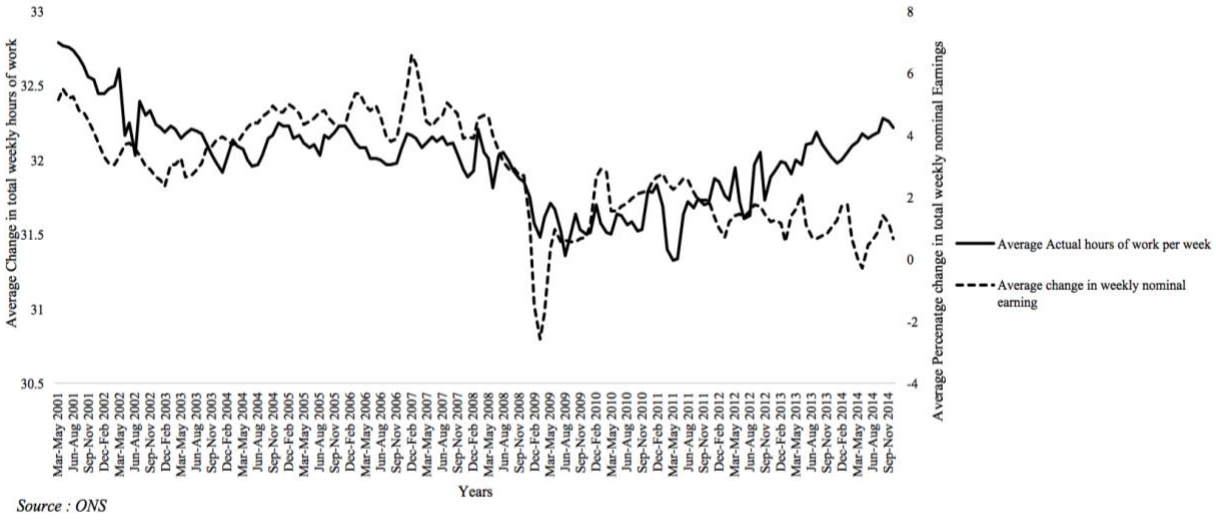
in the final quarter of the recession there was 8.01 million. Students are the most important factor accounting for this increase, where the number of inactive for study reasons grew by 224,000 during that period. This is probably due to earlier reforms acts since 1997 to increase the participation rates in higher education, and to many young workers opting out of the labour market to remain in education during periods of recession (Jenkin, 2010 and Coulter, 2016). Fittingly, the inactivity rates excluding for study reasons fell, but there was an increase in those inactive because of long term sickness and discouraged workers as they believed that no other jobs were any longer available. The Institute of Fiscal Studies points out that the proportion of working age population who are economically inactive today is the lowest since 1991, contrary to previous recessions where inactivity increased sharply for individuals looking for jobs (Disney, Jin and Miller, 2013). This probably means that people are more willing to take work at given real wages and are less responsive to the fall in real wages.

5.2.4.4 Employment levels, Nominal wages and hours of work

Despite the 2008 recession being deeper and more prolonged than the earlier crisis, unemployment rates rose by less than expected and have fallen back more rapidly ever since. The economic recovery was accompanied by a notable rapid job creation. At the end of 2014 employment was at its highest level; at 31 million, 73.2 percent and above than 1 million more than the pre-crisis peak in 2008 (Coulter, 2016 p:197). But behind this good performance, there has been a sharp fall in real wages, hours of work and productivity that resulted an escalation in labour market polarisation and inequality (Taylor, Joweet and HArdie, 2014). This resulted a cumulative fall in real wages by 6.1 percent, the biggest fall in the G7 (Jowett *et al*., 2014). Figure 5.5 below from the ONS reports the three months' average changes in total weekly hours of work and nominal wages between years 2001 and 2014. The graphical presentation below endorses the above findings, where nominal wages experienced the biggest fall during the economic downturn, and more profoundly in year 2009 (over 6 percent decrease in nominal

earnings). A similar pattern of decline is also shown for the average weekly hours of work (decline from on average 32.25 hours of work in a week between December and February in 2008 to 31.25 between June and August in 2009). Still, real wages have not picked-up even when unemployment rates have fallen and the number of workers moving job to job has increased since 2012 and are now close to the pre-crisis level (nominal earnings between September and November in 2014 are still below December and February peak levels in 2007 by 8 percent). Whereas, we can see so far (between December and February 2014) the hours of work have managed to catch-up to its pre-crisis levels.

Figure 5.5: Three Months Average Changes in total weekly Hours of work and nominal Earnings in the UK, years (2001-2014), ONS



5.2.4.5 Part-time and Full-time work

But much of the employment growth has occurred in part-time (from 25.3 percent of the workforce in 2008 to 27.3 percent in 2010) and temporary jobs (from 5.4 percent in 2008 to 6.3 percent in 2010), whereas the percentage of workers in full time jobs fell on average from 74.5 percent (between 2006 and 2008) to 73 percent between (2009 and 2013) (Rodriguez, 2015; Coulter, 2016 p:197). It was only after April 2012 that the UK saw a rise in full time job

creation. Data from the LFS and recent research by the Resolution Foundation with the Centre of Economic Performance at the LSE shows that the main employment rise was concentrated in high skilled occupation (10 percent increase), with very slight growth in medium skilled occupation (1.6 percent) and a decline in low skilled work (by 2.4 percent) (Coulter, 2016 p:209). This provides clear indication that the UK labour market has been increasingly polarised by employment levels and skills deficiencies (OECD, 2013).

5.2.4.6 UK versus US

The difference between the UK and US is that employees in the UK enjoyed more job stability than in previous recessions but sacrificed wages and hours of work, whereas US firms did the opposite, allowing employment to take the hit while maintaining productivity (Coulter, 2016). The trends point out the different economic conditions across countries and their response to the crisis. This has inevitably shown the flexibility of the UK labour market as being behind its good employment performance during recession, especially with its low level of employment protection (scored an average of 1.2 (scale 1 to 5) compared with the OECD average of 2.1) (OECD, 2013). Qualitative analysis by the World Economic Forum identifies the UK as having the fifth most efficient labour market out of 148 countries, after the US, where the US had the least strict market protection in 2008 followed by Canada and the UK (Jowett *et al*., 2014). The measure looks at the flexibility in wage determination, hiring, firing, redundancy costs and other labour market factors.

5.2.4.7. Self-employment

The very high share of the rise in the number of people in work is due to growth in self-employment with the total number of workers rising from 3.7 million in September 2008 to 4.4. million in early 2014. Self-employed now accounts 15 percent of the total labour market (3 percent higher than the levels in year 2001). The growth in self-employment was noteworthy as it accounted for one-third of the net rise in employment since 2001 (Coulter, 2016 p:197).

The ONS (2014) attributed the rise mainly to the fall in number of people leaving self-employment, a marked increase of those who are at or near retirement age, reporting themselves as self-employed due to the decline in the value of their pension annuity and fall in asset prices, maybe encouraging older workers to delay full retirement. Furthermore, a noticeable rise from young entrants and unemployed workers, manifested by the set of government policies adapted to promote an entrepreneurial culture, such as the New Enterprise Allowance, a benefit subsidy for those starting a business and the work programmes and the government flagship welfare to work scheme.

But little evidence was found to support these claims; though the recession pushed some people into self-employment it did not play a major factor in the increase in self-employment. Tatomir (2015), using the LFS data found that the job losses during the recession did not correlate well with the subsequent increase in self-employment and the increase was mainly due to cyclical factors. These factors played a reflecting role to the changes in the long-term trend before the crisis (like the industrial and technological changes connected with the gig economy, changes work, the supply and demand of labour, and changes in the demographic trends; the ageing of the workforce and the growing female participation in self-employment (Tatomir, 2015).Thus, rather than indicating a good recovery of the economy, the high levels of self-employment rates show suspicion of unstable grounds, and raise a concern on the reasons behind why people engage into self-employment (either to reduce their liabilities or to promote entrepreneurial activities), where the newly established businesses are doomed to failure if people involve into such work for the wrong reasons (Cantillon, 1775; Parker, 2004).

5.2.5 Policies after the crisis

The UK also experienced political changes after the general election in 2010, during which the Conservative party won after thirteen years of Labour governing (Rodriguez, 2015). The coalition government has undertaken wide programs of reforms affecting the labour market, to

mitigate the high levels of unemployment rates and to reduce the public debt. These reforms have been the most widely spread policy interventions used by government in recent years to address the effects of the economic crisis (ILO, 2015). The difference between the new deals created by the Labour government and the work programs of the coalition government underlines the differences in the goals of the main political party and the governments themselves. Where active Labour market policies prior to 2010 increased its spending on labour market services, out of work income and maintenance support, especially for the young unemployed, the coalition government emphasised deficit reduction, the simplifications and amalgamation of the new deals proposed in the Work Program for more efficiency, better compliances, less fraud and cost reduction, while still targeting young and the long term unemployed (OECD, 2013; Rodriguez, 2015). The legislative changes expanded the understanding of employment protection legislations, increased the emphasis on apprenticeship and on policies in favour of entrepreneurship, among youth and vulnerable groups. The most common labour market policy reform aims to promote self-employment to reduce unemployment and to foster entrepreneurship (Cueto, Mayer and Suarez, 2017 p:1). This is done by providing access to mentoring and financial support, guidance on how to develop business ideas and offering early stage of financial sustenance (Rodrigues, 2015).

Furthermore, in 2013 the European Commission launched the Entrepreneurship Action Plan 2020 that aimed to ease the creation of new businesses, to remove the obstacles to entrepreneurship and to create a more supportive environment for existing entrepreneurs to allow them to grow (ILO, 2015 b p:1). The action plan takes on mainly three areas of intervention; the first addresses entrepreneurial education and provides support for business creation and growth, to increase people's involvement in the business and the quality of entrepreneurial learning (European Commission, 2012; Fragouli and Giannakovitis, 2017). The second area is aimed at creating a framework that contributes to efficiency and enhancing

the development of the impact. This is accomplished by removing existing barriers and providing more support for the self-employed in different phases of the business cycle, through facilitating their financial access, reducing their regulatory burden and tax compliance cost and providing training support, coaching and networking with peers. The final and most important element is to create a social culture that supports entrepreneurs in Europe and nurtures the new generation of entrepreneurs (European Commission, 2012).

Despite the coalition government's success in keeping good employment records and the European Commission's aim in promoting an enterprise culture, the UK capital market was deep-seated by the problems in productivity growth, the lack of support for the high-skilled workers that distorted the balance between skill levels and increased inequality even more (ILO, 2014; Rodrigues, 2015). Hence, the up-skilling attempt of the labour force appears to be thrown in reverse, where UK workers are still less productive than what they were before the incident of the financial crisis.

Hence, we attempt in this chapter to capture the effect of the 2008 financial crisis on the transition behaviours for our division of workers, and to assess whether our data reflects the true changes that occurred in the labour market recently. Our focus remains on the flow in and out of self-employment only, prior and after the economic downturn in years 2008-2009. Later, we leave the assessment of policy implications for future work.

5.3 Approach

Our main aim in this last empirical chapter is to observe the transition behaviours of our respondents, especially for our subdivision of self-employed workers in the sample. We want to check how well the results help us explain the overall changes that occurred in self-employment after the economic downturn in the UK labour market. As previously mentioned, the analysis here is exploratory and descriptive in nature, where at the beginning we look at the pattern of growth in our sample, the flow of workers in and out of self-employment, and

observe the stock of measure of our previously established division of sustained self-employed, dabbled self-employed and always employees, at the existing point in time in our study(between years 1991 till 2008 from the BHPS and 2010 till 2014 for the continuing BHPS members in the UKHLS), and compare with the ONS findings.

We then re-categorise the same division criteria for our sustained self-employed, dabbled self-employed and always employees, but only between the years 1991 till 2002 and we observe their transition behaviour in the labour market states (paid employment, self-employment, unemployment and inactivity) before the start of the recession (pre-crisis), between the years 2003 and 2007 (from our BHPS sample), and after the crisis (post-crisis), between the years 2010-2012 ((from our continuing BHPS sample in the UKHLS). This re-categorisation is labelled in this chapter as approach 1 and the division criteria for this approach is as follows:

- All workers must be observed for more than one-third of the specified time frame (from 1990 till 2002, total observed period is twelve years), more than four waves.
- All workers cannot be observed more than two waves in inactivity or unemployment.
- Sustained self-employed are seen 55 percent and more of their total employment in self-employment.
- Dabbled self-employed are observed less than 55 percent of their total employment in self-employment.
- Always employees are observed during their total employment time only in paid employment.

Following this division criteria, we have 1,404 workers who are identified as sustained self-employed, 792 dabbled self-employed and 11,184 always employees. The reason for such re-classification is to constitute somehow our 'counterfactual' flow, as what we would expect in

respect to labour market transitions to happen when the labour market is booming, as before the crisis occurred, and what changes after the crisis. Hence, we look at the changes of behaviours for a consistent set of people in each group that is being compared post-crisis as well as pre-crisis.

We also create an additional re-classification for the sustained self-employed, dabbled self-employed and always employees, but between the years 1991 and 2007, and observe their labour market transitions after the recession, between the years 2010 and 2014 (for our continuing BHPS members in the UKHLS). This additional re-categorisation is named in this chapter as approach 2 and is used for comparison only. The division criteria for approach 2 is as follows;

- All workers must be observed for more than one-third of the specified time frame (from 1990 till 2007, total observed period is seventeen years), more than six waves.
- All workers cannot be observed more than two waves in inactivity or unemployment.
- Sustained self-employed are seen 55 percent and more of their total employment in self-employment.
- Dabbled self-employed are observed less than 55 percent of their total employment in self-employment.
- Always employees are observed during their total employment time only in paid employment.

This allows us to identify a higher number of self-employed workers; 1,425 workers as sustained self-employed, 1,089 dabbled self-employed and 11,360 always employees, where we are look at their changing transition behaviours between the different labour market states only after the recession and compare with the post-crisis transitions' findings of approach1. Hence, we acknowledge that the people defined in approach 2 are different groups to those defined in approach 1, however we use approach 2 to only check how well the findings fit the

transitional behaviour of workers in approach 1 to further validate this approach and strengthen our results. Hence, we do not only witness a combination of difference in behaviours but also a difference in the people who are defined in each group.

The analysis here focuses on the transitional flow of our workers in approach 1, the attributes of workers, and the earnings returns to formal education between the two identified periods, (pre-crisis; from years 2003 to 2007 and post-crisis; from years 2010 to 2014), to capture any changes in the transitions behaviours, in accumulated years of education and in earnings returns to formal education for our consistent set of workers.

We chose to study these two different time frames (from 2003 to 2007) and from (2010 to 2014), for five consecutive years in a row to have more objective assessment in analysing workers' transitions behaviours prior to the crisis, when the economy is buoyant and after the economic downturn when the economy is still recovering. As noted earlier, the limitation in our study is that the we have missing data for the year 2009, where the BHPS stops interviewing respondents at year 2008, and its successor, the UKHLS starts back with the continuing BHPS members at year 2010 till most recent release for year 2014. For this reason, we choose to exclude both years 2008 and 2009 from our analysis, mainly because the crisis occurred in between these periods and because we are interested in examining the effect prior and after the economic downturn.

We mainly focus on the flow of dabbled self-employed and their response to shocks in comparison to the sustained self-employed and always employees, because they have proven in previous empirical work to be different with respect to their socio-economic and demographic characteristics and to their earnings return to formal education. Surprisingly, we found that dabblers have more advantaged attributes than the sustained self-employed and the always employees in chapter 3 of this thesis. Also, they report higher numbers of years of education in chapter 4, but for some reason they do not seem to enjoy higher returns than the

other two groups of workers (the fixed effects estimates show lower returns for this group of workers in comparison with wage earners), where we couldn't explain the reason behind such findings. Hence, we are interested in examining their unique dabbling and transition behaviour between the different labour market states that might help us explain the changes in growth in self-employment that occurred in recent years and explain the reasons behind receiving lower earnings returns (probably this might be the consequence of their own dipping-in and out pattern).

Based on our intake from the previous empirical chapters, we are left with different perspectives. On one end, we may find that the dabbled self-employed are simply the younger version of those who we previously identified in our data as sustained self-employed, and we can see our work in line with the ONS (2014) findings on self-employment, which suggests that the rise in self-employment jobs during the economic downturn is mainly due to longer duration of workers in self-employment. We can also examine this aspect by looking at the transition pattern of the sustained self-employed throughout the available time frames, and check if they were able to endure in self-employment after the economic downturn. This will support our initial reasoning that they are more established in self-employment than the dabbled self-employed because they have more self-employment experience and are observed for longer in this specific labour market state. We can also relate this with the previous findings in chapter 3 of the thesis, where the sustained self-employed have been shown to have more specific attributes in line with self-employment that are keeping them well embedded in this specific labour market state.

On the other end, we may find that both subgroups of self-employed behave differently in response to shocks and that dabblers are quite distinctive in respect to their transition behaviour from those who remain on average longer in self-employment (the sustained self-employed). We may find that the dabbled self-employed control a sequential portfolio of

working people, possibly 'trying-out' both types of employment and seeing what best suits their skills, hence making the most out of self-employment and paid employment jobs when the time and conditions allow them to do so. However, the limitation of our study does not allow us to deeply investigate this dynamic element and look at the extent to which the various types of jobs have changed. But somehow looking at how they behave differently when the economy is buoyant and how they change their form of work following the recession (shifting from self-employment to unemployment, inactivity, or paid employment and vice-versa), can provide us with more insight on the nature of their dabbling pattern, the push or pull effect and can help us justify why dabblers receive lower earning returns from the sustained self-employed and always employees.

Additionally, we are also interested in exploring the transition behaviour for wage earners during the economic crisis and possibly checking for any new upcoming trend from paid employment towards self-employment. Maybe we can witness a similar cycle-in and out behaviour among paid workers in self-employment, and again the rise of newly formed dabbled self-employed. However, we might attribute this growth in self-employment with the undesirable effects of the economic downturn, where according to the literature, the long-term structural changes in the labour market (changes in the form of work, supply and demand of workers) and the economic downturn have triggered the rise of insecure and temporary jobs among workers who are willing to accept the fall in nominal wages, and the insecurity in pay and work instead of entering unemployment.

Nonetheless, we might also find that some of our workers (sustainers, dabblers and always employees) have opted out of work to remain in education and to ride out the economic downturn. This could explain why some report higher years of education than others, where we can see our work in line with the OECD (2013, 2014) findings that show an increase of 15 percentage points during the year 2012 for tertiary educated adults, especially among the

unemployed and the proportion of employed workers. Also, we cannot rule out the likelihood that others become less motivated or reach retirement and decide to leave the labour market and become inactive. Our data constrains us from finding out the causes behind such drop outs, but still these assumptions cannot be ruled out when any of our workers transit out of the labour market.

As such, we recognise that this chapter is exploratory in nature, and can take us into different directions, but the main aim behind the work here is to find out if the transition behaviour of our division helps us explain the overall changes in self-employment throughout the years, especially after the economic downturn. Did recession promote employees to 'dabble' or did some 'sustain' self-employment? Or did the dabblers simply increase the amount of time spent in self-employment after the recession?

The main objective of our thesis is to capture and to stress on this new contemporary form of work (the dabblers in self-employment and in paid employment) that has not been separately identified in the labour market to date, and to offer a better proximity on the behaviour of workers in the labour market prior to and after the economic downturn. Where we raise awareness of policy makers on this dabbling form of work, with the most challenging factor looking at the issue of their security and longevity to help support effective labour government policy. Thus, we argue that there is more than a simple dichotomy between paid employment and self-employment.

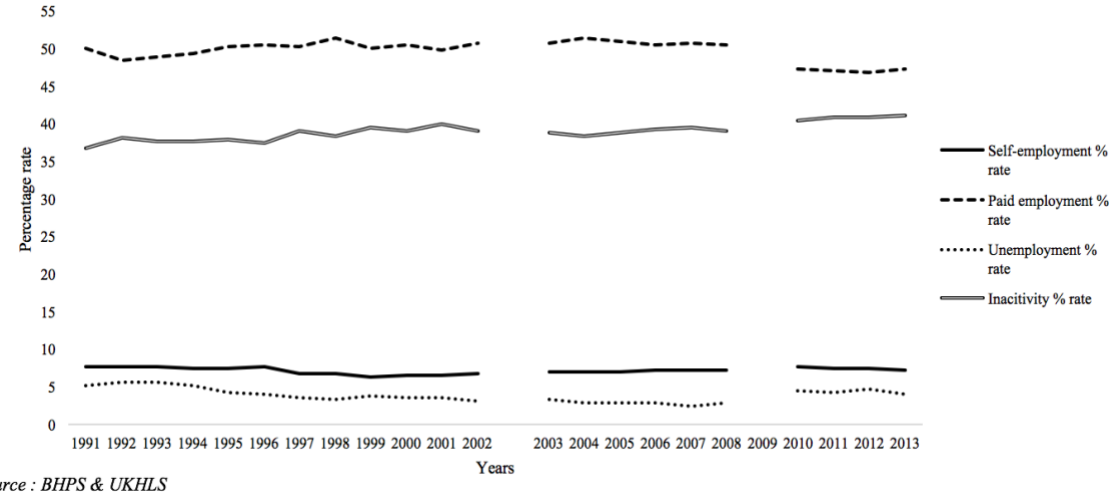
5.4 Results and discussions

5.4.1 Paid employment

Figure 5.6 below displays the pattern of growth for our respondents in the dataset between the years 1991 till 2014 (with missing values for the year 2009). As shown from the graph below, the highest percentage of our respondents reports they are in paid employment (around 50 percent) and in inactivity (between 35 percent to 40 percent), while a much smaller share

reporting that they are in self-employment (between 6 percent to 8 percent) or in unemployment (between 2 percent to 5 percent). The graph below does not entail much details on the fluctuations of our workers in the dataset, especially for the self-employed. For this reason, table 5.3 is introduced to report the percentage rates for self-employment, paid employment unemployment and inactivity rate, throughout the observed years (between the years 1991 till 2014, with missing values for year 2009) using our data (the BHPS and UKHLS surveys) and to compare with the ONS reported statistics.

Figure 5.6: Respondents Flow in self-employment, paid employment, unemployment and inactivity (BHPS 1991-2008, UKHLS 2010-2014)



Source : BHPS & UKHLS

Table 5.3: *Self-employment, paid employment, unemployment and inactivity percentages in the UK labour market ((BHPS 1991-2008, UKHLS 2010-2014) and (LFS and ONS 1991-2014)*

	BHPS & UKHLS				ONS			
Years	Self-employment % rate	Paid employment % rate	Unemployment % rate	Inactivity % rate	Self-employment % rate	Paid employment % rate	Unemployment % rate	Inactivity % rate
1991	7.8	50.1	5.3	36.8	10.8	57.9	8.9	22.4
1992	7.8	48.5	5.6	38.1	10.4	56.4	9.9	23.3
1993	7.7	48.9	5.6	37.7	10.2	55.9	10.4	23.5
1994	7.6	49.3	5.3	37.8	10.4	56.3	9.5	23.8
1995	7.6	50.3	4.2	37.9	10.4	57.2	8.6	23.8
1996	7.8	50.6	4.1	37.5	10.1	58.1	8.1	23.7
1997	6.9	50.3	3.7	39.1	9.9	59.6	6.9	23.6
1998	6.7	51.4	3.4	38.5	9.5	60.6	6.2	23.7
1999	6.4	50.1	3.8	39.6	4.2	66.5	6.0	23.3
2000	6.5	50.7	3.6	39.2	9.1	62.2	5.4	23.3
2001	6.5	49.8	3.7	40.0	9.1	62.4	5.1	23.4
2002	6.8	50.8	3.2	39.2	8.9	62.5	5.2	23.4
2003	6.9	50.9	3.4	38.8	9.5	62.3	5.0	23.2
2004	7.1	51.5	2.9	38.5	9.7	62.1	4.8	23.4
2005	7.0	51.1	3.0	38.9	9.6	62.3	4.8	23.3
2006	7.2	50.5	2.9	39.3	9.7	61.9	5.4	23.0
2007	7.3	50.8	2.4	39.5	9.8	61.7	5.3	23.2
2008	7.3	50.6	3.0	39.1	9.8	61.5	5.7	23.0
2009					9.6	59.6	7.6	23.2
2010	7.6	47.3	4.6	40.5	9.9	58.7	7.9	23.5
2011	7.6	47.1	4.4	40.9	9.9	58.7	8.1	23.3
2012	7.4	46.9	4.7	41.0	10.4	58.8	8.0	22.8
2013	7.3	47.4	4.1	41.2	10.6	59.4	7.6	22.4
2014	7.6	47.7	4.0	40.6	11.2	60.4	6.2	22.2

Source: BHPS, UKHLS & LFS, ONS

Notes: The percentages are adjusted to accommodate workers who are outside the workforce (in inactivity), for that reason the ONS statistics presented in the above table are much lower than the percentages mentioned in the literature section, which looks at the percenatge rates of the self-employed in the labour market (between self-employment, paid employment and unemployment only)

According to table 5.3 above, around 50 percent of our workers are in paid employment, the percentages fluctuate between 50.1 percent in the beginning of 1991 to 50.8 percent in 2007 prior to the economic downturn, 47.3 percent in 2010 when the effect of the crisis is still evident and to 47.7 percent in 2014 when the market has recovered. In comparison to the ONS and LFS findings at the right hand-side of table 5.3, our statistics are a bit smaller (less by 10 percent than the ONS and LFS statistics). This is conceivable since the ONS and LFS have a wider coverage of the UK population than our households' studies (the BHPS and UKHLS). The use of post-stratification methods and weighting procedures are intended to correct for such dissimilarities between our sample and the population size, but as previously mentioned in chapter 3 of this thesis, we restrain from using these methods as they result huge decrease in our sample size.

What is more is that the labour specifications of workers are different between studies, because our surveys are not administrative in their nature (refer to chapter 3 of this thesis). Our

data does not follow the ILO employment definitions, and only rely on self-reporting that can result in subjective response from respondents over their labour market status (Long, 2009 p:49). Nevertheless, the LFS estimates on the market flow are experimental, do not have national statistical status indicators and are not suitable for labour market indication if they are used on their own. For that reason, we combine both LFS and ONS estimates to get a better understanding and comparison of the aggregate labour market estimates.

Conversely, both studies (the BHPS and UKHLS and the LFS and ONS findings) exhibit similar patterns of growth, whereby in the ONS and LFS there are over 57.9 percent of workers classified in paid employment in 1991. The figures increased to 61.7 percent in 2007, dropped down by 3 percentage points in 2010 and improved to 60.4 percent in 2014. As shown from the table 5.3 above, the total employment levels in both studies decreased after the economic downturn (in 2010) but did not take much longer to reconnect back to its prior levels.

5.4.2 Unemployment

Less than 6 percent of our respondents are observed in unemployment, starting at 5.3 percent in 1991, dropping to 2.4 percent (the lowest percentage in our data) in 2007, almost doubling to 4.6 percent in 2012, then slightly dropping to 4 percent in 2014. In the ONS and LFS data, the figures are a bit higher but are similar in the way they act, starting at 8.9 percent in unemployment in 1991 to 5.3 percent prior to the crisis in 2007, increasing to 7.9 percent in 2010 and falling to 6.2 percent in 2014. In both studies, the unemployment percentage rates increased significantly after the economic downturn but managed to fall back in 2014 and became lower than their initial figures in year 1991.

5.4.3 Inactivity

Remarkably, the percentage rates for our respondents outside the labour market (inactive) are much higher (more than 10 percent) than that of the ONS and LFS findings at the right end-side of the table above. Like the ONS and LFS study, we restrict our data to respondents' age

of 16 and above but do not limit our workers till the age of 64, unlike the comparable study. Perhaps, this might explain why we have a larger number of people who are inactive as we observe much older range of respondents. But, in both reports, we find that inactivity rates increase after the economic downturn (from 39.5 percent in 2007 to 40.5 percent in 2010 in the BHPS and UKHLS data, and from 23.2 percent in 2007 to 23.5 percent in 2010 in the ONS and LFS data). However, for some reason it continued to rise in our data after the year 2010, whereas in the ONS and LFS study we find it decreasing. Perhaps, this might be because we follow the same workers for over twenty-three years, and after a certain time we would expect that some might decide to retire as they get older, while others may get demotivated and leave the labour market, along with several that might go back to education.

5.4.4 Self-employment

Focusing on the self-employed percentage rates in our data, the figures are lower than the ONS and LFS findings, but both records exhibit a similar outline to what is denoted earlier in the literature. We must note that the percentages presented in table 5.3 for both studies are adjusted to consider the inactivity rate, while the literature consider the percentages with respect to the total workforce, meaning with respect to paid employment, self-employment and unemployment only, without considering those outside the labour market. Hence for such reasons the percentages presented here are different and lower from the ones discussed earlier in the literature section of this chapter.

We notice a stable growth in self-employment in the early 1990s in both datasets, then a noticeable drop is detected in the mid 1990s and the early 2000s (from 7.8 percent in 1996 to 6.5 percent in 2001 in the BHPS and UKHLS dataset, similarly from 9.9 percent to 9.1 percent in the ONS and LFS statistics). Followed by a rise between years 2002 and 2007 (from 6.8 percent in 2002 to 7.3 percent in 2007 in the BHPS and UKHLS dataset, and from 8.9 percent to 9.8 percent in the ONS and LFS statistics). After the economic downturn, we notice a more

predominant rise in the ONS and LFS figures with concern to self-employment (from 9.8 percent in 2008 to 11.2 percent in 2014), whereas we only depict a 0.3 percentage point increase in self-employment rates between these periods in our dataset.

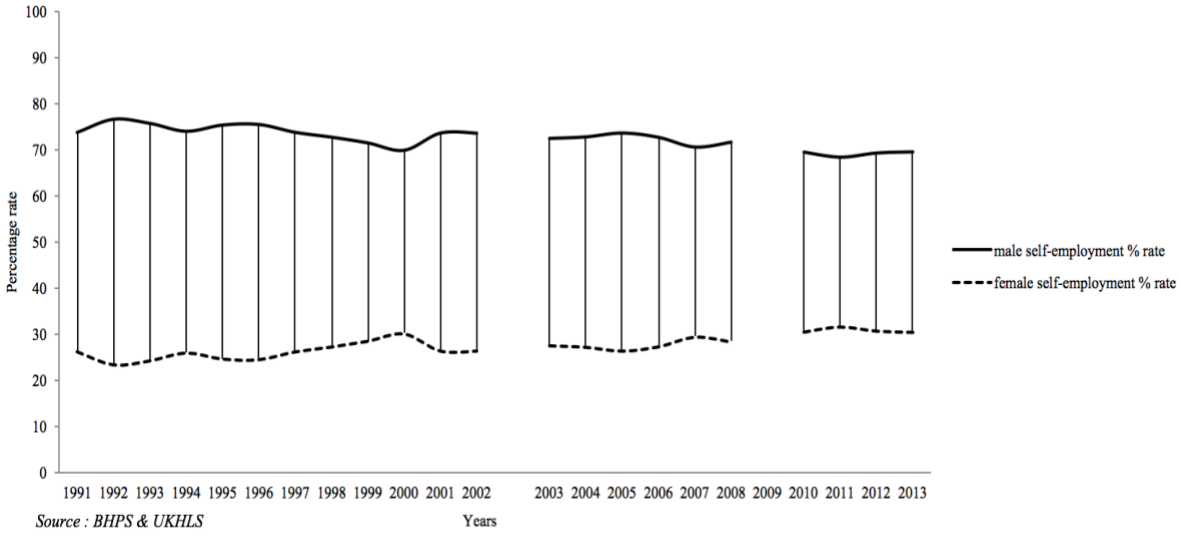
Hence, from what is presented in the above table, our data does not explicitly show the increase in self-employment after the economic downturn, unlike the ONS and LFS study. The increase can be attributed to new labour market entrants in which our surveys are unable to depict, as they follow the same workers throughout a certain period. This draws a limitation in our study that is out of our control. However, we continue with our analysis, and look at the extent in which the crisis affected our division of workers in the labour market and check how well our results can still fit with the ONS findings.

Figure 5.7 below includes the full-time male and female self-employed in our data and looks at their flow in self-employment throughout the observed years. The graph shows that most self-employed are men, around 75 percent of the total self-employed workers and the remaining are women. Between the years 1991 till 2000, the rates of male self-employed steadily declined by 5 percent, followed by a slightly upward but more fluctuating trend until the year 2008 (72 percent), then a drop down below 70 percent after the economic downturn and until most recent data in year 2014. Although self-employment in the UK is mainly male oriented, there are a small proportion of the female workers, around 25 percent who were self-employed in 1991 and the rates steadily continued to rise, even after the economic downturn to reach 35 percent of the total self-employed workforce by the end of 2014.

What has been shown is that there are some significant differences between gender behaviours in the labour market in our dataset, where male self-employment seems to be predominant in the UK labour market. This also confirm with the statistics of the Eurostat (2014a) labour market database that consider male self-employment rates to be twice as larger as female self-employment rates. Also, from the figure below, it is evident that women self-

employment rates lag men self-employment rates but are more stable and increasing over time. The results also confirm with Taylor's (2004) work using the LFS and observing self-employed workers from 1970 till 2002. The Findings of the European Social Survey (2010) also report a steady rise of women participation in self-employment over the last few years, particularly in two main industries; the administrative and support service and the human health and social work activities. Hence, although self-employment rates in our data is male oriented, the main drivers of growth in self-employment throughout the years are driven by the increase of female participation rates in self-employment.

Figure 5.7: Self-employment rates by Gender as a percentage of the workforce (BHPS 1991-2008, UKHLS 2010-2014)



5.4.5 Self-employment Inflow and Outflow rates

However, the causes behind these deviations are not easily identified. The increase in self-employment rates might have been caused by an increase in the inflow rate (the number of workers entering self-employment as a share of the total in self-employment) with the outflow rates being stable. Or due to a decrease in outflow rate (the number of workers leaving self-employment as a share of total self-employment), with inflow rates remaining constant.

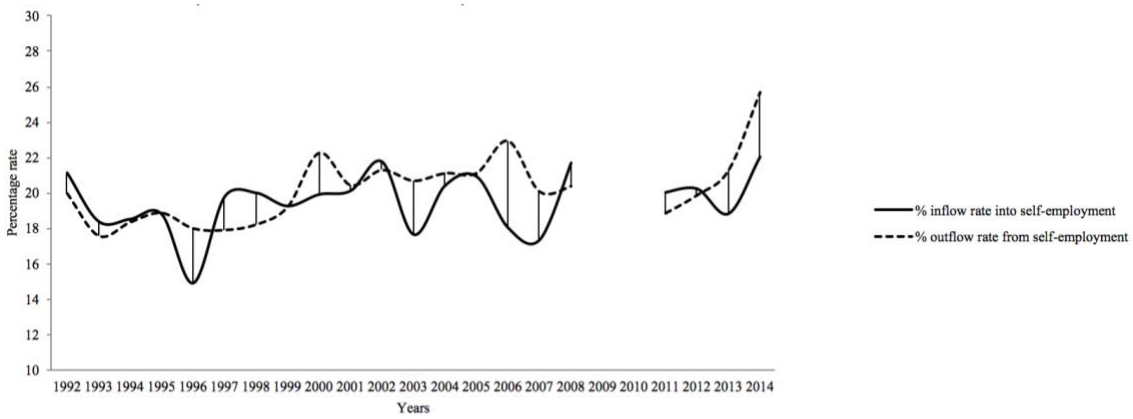
Likewise, the decrease might have occurred by growing number of outflow rates while inflow rates remaining constant, or a decline in inflow while outflow rates not changing. To have stronger evidence underlying the growth in self-employment rates in our sample, we introduce figure 5.8 below that represents the changes underlying the growth in self-employment rates by scheming the inflow and outflow rates into self-employment in the UK, for the years 1992 till 2014 (with missing computation for the years 2009 and 2010)

Figure 5.8 below suggests that the growth in self-employment (both male and female self-employment rates) in the early 1990s was due to higher levels of inflow rates rather than a change in the duration of spells. The trend stopped in the mid 1990s, due to a sudden fall in inflow rates (between the years 1995 and 1996, inflow rate fell by 4 percent), then stood back between the end of the 1990s and at the beginning of the year 2000 with a more rapid and higher rise (increased by 5 percent, from year 1997 to 2000), while outflow rates remained constant at 18 percent. Following this period, inflow rates continued to rise, however there was a predominant rise in outflow rates at the beginning of 2000. In the mid 2000 till the year 2007 before the crisis, we notice severe drops in inflow rates, by 4 percentage points. But the positive and negative fluctuations between the inflow and outflow rates summed up to a constant state throughout the period, confirming with the ONS statistics and with our findings previously presented in table 5.3 above.

During the economic downturn (from year 2008 to 2012, with missing year 2009 and 2010), we notice that the inflow levels have picked up (from 17 percent to 22 percent) and were higher than the outflow rates, where these latter declined (from 20 percent to 18 percent). Hence, the increase in self-employment rates following the 2008 financial crisis was due to the decline in the rate of individuals leaving self-employment and rise of individuals entering self-employment.

After the market recovery between years 2013 and 2014, we notice a sudden predominated rise in outflow rates in comparison with inflow rates (outflow rates from 20 percent to 26 percent, whereas inflow rates ranged between 18 percent and 22 percent). This opposes with the ONS findings in table 5.3, where we notice an increase in self-employment rates, during this specific time. Perhaps we can attribute the rise in outflow rate to the ageing of our sampled workforce as we observe them for over twenty-three years. What is more, we found that the self-employed are on average older than paid workers in our data (this was shown in the previous two empirical chapters of this thesis). Also, the increase in self-employment rates might be attributed to the rise in inflow from newcomers in the labour market where our data is unable to depict this effect as we are only restricted to observe the same group of people for a certain period.

Figure 5.8: Self-employment inflow and outflow percentage rates (BHPS 1991-2008, UKHLS 2010-2014)



Source : BHPS & UKHLS

Our results following the crisis confirm well with the ONS (2014) findings, where the increase in self-employment during the recession was mainly attributed to business owners staying longer in the job market and seeing upcoming trends because of the job reduction in paid employment. According to the ONS (2014) release, in 2014, there were over 4.6 million self-employed workers in the UK, with 1.7 million started their business in 2009. Over the past

20 years, the percentage rates of people entering self-employment remained constant between 36 percent to 38 percent, and the percentage rates of people leaving self-employment lied between 32 percent to 37 percent, until the last 5 years where it fell by 14 percent (ONS, 2014). Given, the Small Business Service (SBS) Household Survey of Entrepreneurs in 2007, the proportion of self-employed stayed roughly constant between 11 percent to 12 percent, between 2001 and 2007. But, compared with the findings of the Global Entrepreneurship Monitor, these figures weren't comparably high like other developed countries (Bosma and Levie, 2009). Although the percentage rates in figure 5.8 are not similar to the ONS nor to the SBS findings, they still follow a similar pattern of growth between the years 2008 and 2012. Thus, the increase in self-employment rates during that period was mainly attributed to fewer people leaving self-employment and a higher inflow of people starting their own business than in previous years. Counter arguments are also proposed by the ONS, where it attributes most of the increase in self-employment, by "the change of status of people who were already in the employment estimates but in another flexible employment, hence implying little impact on the overall employment" (OECD, 2013; Coulter, 2016 p:24).

5.4.6 Recession-led hypothesis

In general, we can relate this effect to the recession-led hypothesis, "the refugee effect" and the push model, where the crisis forced many businesses to shut down and placed employees at redundancy, hence increasing the level of unemployment and raising the supply of self-employed workers in the market (Thurik *et al.*, 2008). For that reason, paid employment and self-employment did not take the same hit, where the total number of paid employees fell, while the number of individuals starting their own businesses rose (ONS, 2014). The Bank of England in its quarterly bulletin, from the second quarter of 2014 highlighted that the rise in self-employment since 2008 reflects factors associated with the recession. Like, the weak demand of labour among firms, accompanied with the decrease in real household income

among potential second earners. Thus, making those who were unable to find paid work become self-employed.

In the US, business creation has increased steadily during the crisis, although unemployment rates continued to rise over 10 percent, whereas throughout the period of strong economic growth "the roaring 90s" the creation was lower (Fairlie, 2013). Similar pattern was also found in the UK, according to Bell and Blanchflower's (2011) study. But previous research on the relationship between unemployment and entrepreneurship showed mixed results, positive (countercyclical), negative (pro-cyclical) and zero relationships to exist all at the same time (Parker, 2009).

5.4.7 Changes in nature of work

Accordingly, the changes may not only be attributed to the effect of the crisis nor to the government policies implemented that are in favour of self-employment. There are long term changes in the nature and forms of the work; like the freelancing instead of owning a business, and the possibility of combining both self-employment and employment together. Also, the expansion of the UK ageing workforce population, the rise in retirement age, the longer life expectancy, besides the low disproportional levels of pension savings, the emergence of the gig economy, the changes in the supply and demand of workers and the nature of work, all contributing to the increase of business start-ups (D'Archy, and Gardiner, 2014).

5.4.8 Division stock of measure

We shift in our observation from the flow of our respondents in self-employment to look at the stock of measure of our formed division, especially between the two subgroups of self-employed; the sustained and the dabbled self-employed. A stock is a measure at one specific time and presents a quantity existing at the point of time or may have accumulated in interval of time, whereas a flow is a measure over an interval of time. Based on our initial division criteria we already defined our group of workers on the time seen in employment and self-

employment, during the whole period of study, and their restrictions to the maximum time seen in unemployment and/or inactivity. Therefore, we do not observe their flow in these states, but actually their stock of measure in each previously defined employment status in our study. In the previous two empirical chapters, we looked at their socio-economic and demographic differences and how the earnings returns for formal years of education vary between these groups of workers. In this chapter we now look at the way our group of workers progress differently in self-employment throughout the years.

Figure 5.9 illustrates the stock of measure for our division of workers (the sustained self-employed, the dabbled self-employed and the always employees) in the labour market states (in self-employment, paid employment, unemployment and inactivity), throughout the whole period of our sample (from year 1991 till 2014, with missing year 2009). Based on our original established division criteria, we are left with 1,146 workers labelled as sustained self-employed, 1,149 dabbled self-employed and 9,362 always employees. The y-axis measures the percentage rates in paid employment, self-employment, unemployment and inactivity. We do not focus much in the discussion here on workers' occurrence in inactivity and unemployment because we have already restricted the number of times they can be observed in either status in our division criteria (maximum each worker can be seen for 2 times in either inactivity or/and unemployment). We further explore, the pattern of growth into these two-specific statues in the following approaches (approach 1 and 2 that we previously identified in section 5.3 of this chapter) and look at the flow of the newly formed divisions between two specific periods of time (years 2003 till 2007 and 2010 till 2014).

5.4.8.1 Sustained self-employed

We previously defined our sustained self-employed as workers who are seen more than 55 percent of their total employment time in self-employment. We can clearly observe such pattern for the sustained self-employed stock of measure in figure 5.9. More than 75 percent

of our sustainers spend their time in self-employment at the beginning of our study (in year 1991). Less than 20 percent are in paid employment, and the remaining are in unemployment and inactivity. Between the years 1991 up to 2003, we observe a consistent increase for our sustainers in self-employment (from 75 percent to 85 percent of workers are seen in self-employment), whereas their levels in paid employment witnessed a fall (from 18 percent to 10 percent of sustainers are seen in seen in paid employment). We also witness a decline in unemployment levels (from 5 percent to 2 percent), whereas inactivity rates remained roughly the same (around 3 percent of their time). Following the years before the crisis (from 2004 to 2007), during which the period was characterised by strong labour market we notice a significant fall for our sustainers in self-employment (from 85 percent to 80 percent). This was upturned by their increase in paid employment. After the economic downturn, their levels in self-employment reached higher levels than the pre-crisis levels (87 percent of our sustainers are in self-employment in 2010, compared to 84 percent who were in 2007), later the percentages sharply decreased to 78 percent, whereas the percentages in paid employment increased by 5 percentage points (to reach 15 percent of total sustainers). The remaining 9 percent of our sustained workers exited the labour market and became inactive.

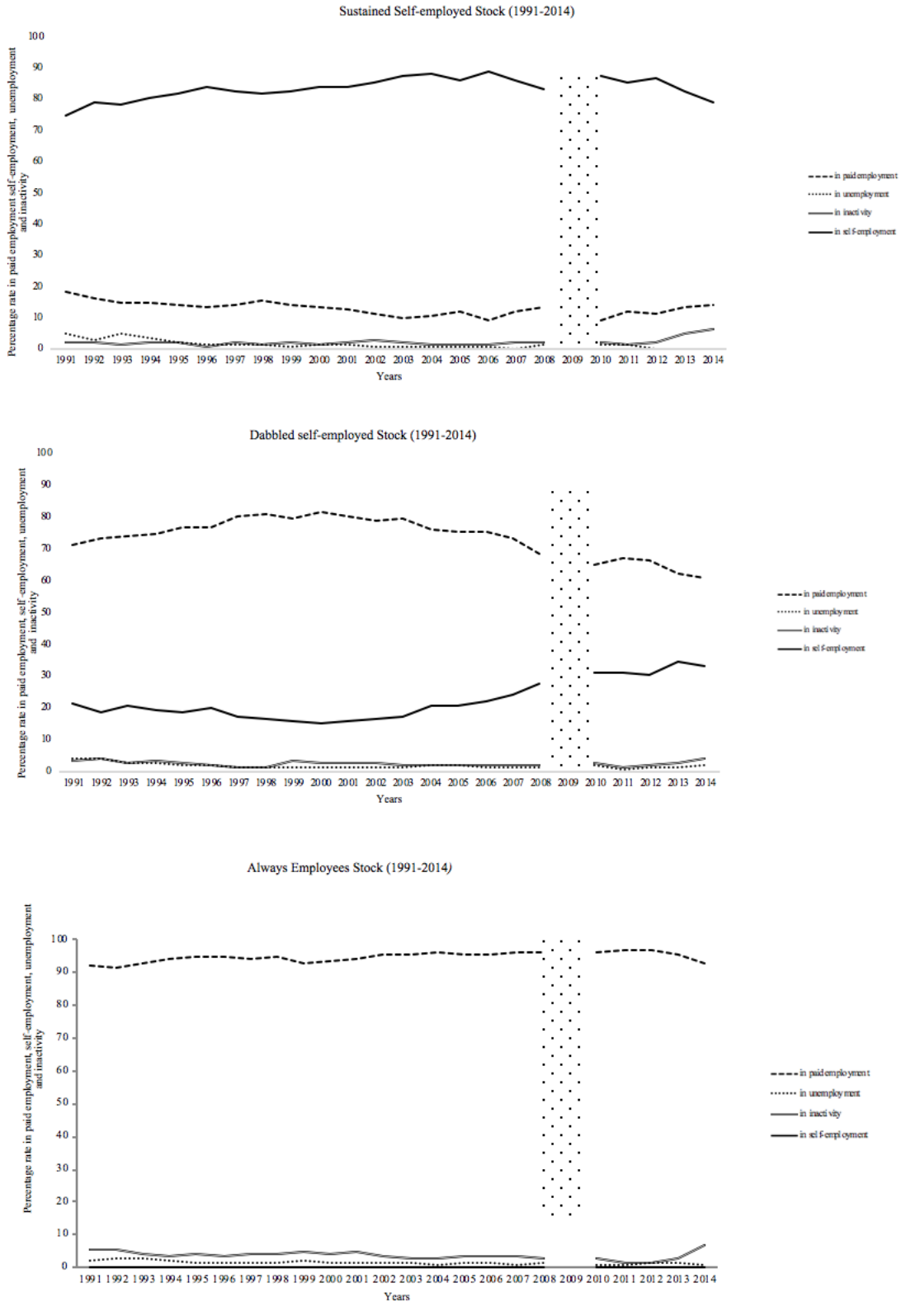
5.4.8.2 Dabbled self-employed

Different results were found for our dabbled self-employed, where the majority are observed in paid employment (around 70 percent), next in self-employment (around 22 percent) and the rest in unemployment and inactivity, in year 1991. Oppositely from the sustained self-employed we notice that their dip-in behaviour in self-employment has increased over time, especially in the early years 2000's (between years 2003 and 2007, the proportion of dabblers in self-employment increased from 15 percent to 27 percent), and more predominantly after the economic downturn (the levels of dabblers in self-employment further increased to reach 34 percent in 2014, the counter effect was observed in paid employment).

5.4.8.3 Always Employees

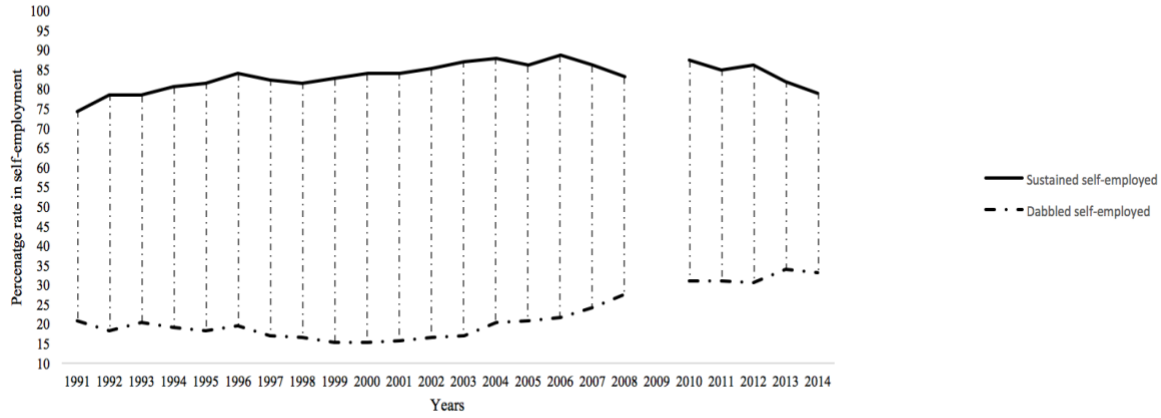
The last graph in figure 5.9 shows the stock of measure of the always employees, who are seen during their total employment time in wage employment only (for that reason the right y-axis does not report any percentage rates in self-employment). We notice that their proportion remained relatively stable during the whole time, around 95 percent of these workers are observed only in paid employment in the past 23 years. Only in the last 2 years (2013 and 2014) of our study we notice a rise in inactivity rate, where around 9 percent of them existed the labour market.

Figure 5.9: Division 1 Stock measure (BHPS 1991-2008, UKHLS 2010-2014)



Source : BHPS & UKHLS

Figure 5.10: Dabbled and Sustained Self-employed Stock of measure in Self-employment (BHPS 1991-2008, UKHLS 2010-2014)



Source : BHPS & UKHLS

5.4.8.4 Sustainers and Dabblers

We introduce figure 5.10 above to look at the stock of measure between our two subgroups of self-employed but only in self-employment. As can be shown the distance between the dabbled and sustained self-employed percentage rates in self-employment has narrowed down over time. Where those who we labelled as dabblers seem to be boosted in self-employment over the years, especially from the early years 2000's and more predominantly after the economic downturn. Whereas the proportion of sustainers who we observe in self-employment has decreased over time. The declining trend is noticeable from the mid of the years 2000s and more rigorously after the economic downturn. This is mainly due to their surge in paid employment jobs and their shift out of the labour force.

Perhaps the witnessed changes are caused by long-term structural changes in work, the rise in part-time and precarious jobs associated with the Gig economy, which caused changes in the supply and demand of workers and increased the movement of dabblers in self-employment. And maybe because of the crisis. This negatively impacted our group of sustainers, pushing them out of their persistent jobs towards accepting lower paid jobs rather

than becoming unemployed, and increased the flow of dabblers in self-employment because of the absence of alternative paid work. Not to forget the nature of our data, where we observe the same workers for over twenty-three consecutive years, and perhaps after observing workers for such long, some might decide to retire, hence become inactive. We might also witness the exit of dabblers from the labour market to continue their formal education and perhaps this might explain why they report higher number of years of education than our other two other groups of workers. Finally, we cannot rule out the effect of respondents' attributes, and earnings returns during the different periods, in which it might have negatively or positively impacted the flow in and out of self-employment.

5.4.9 Approaches

To further validate our work, we do not only rely on the stock of measure to explain the deviations in our division, for this reason we introduce our approach 1 and look at the changes in the transition behaviour of our division of workers throughout the two specified periods of times (pre-crisis; between years 2003 till 2007, and post-crisis; between years 2010 till 2014), along with exploring the changes in workers' socio-economic and demographic characteristics and earnings returns, in these two time frames and comparing the results with the transitions behaviour of workers in approach 2 between years 2010 and 2014, their socio-economic and demographic characteristics and their earnings returns to years of education.

5.4.9.1 Approach 1

Our approach 1 consists of re-categorising our division of workers but only between the years 1991 till 2002. This is graphically shown by the drawn line in figure 5.11 determining the cut off point for our division. Like our initial division, the sustained self-employed are workers who are observed 55 percent and more of their total employment time in self-employment. The dabblers are at least seen once and less than 55 percent of their total employment time in self-employment, and the always employees are during all their employment time in wage

employment only. Similar to our original division criteria, we impose a restriction on the number of times they are seen in the sample, more than one-third of the total imposed period between years 1991 till 2002 (at least observed in our data for more than four waves), and on the number of unemployment and inactivity spells (maximum two spells of either these two status). Based on this division criteria, we have 1,404 sustained self-employed, 792 dabbled self-employed and 11,184 always employees, where we observe their flow in the different labour market states between the years 2003 and 2007, prior to the economic downturn and between the years 2010 and 2014, after the economic downturn. The main aim behind looking at this time frame is to observe the transitions behaviour of our division of workers between periods when the economy is thriving, at its full, and when it is still recovering from the crisis to check how the labour market conditions affect the flow of workers in and out of self-employment.

5.4.9.1.1 Sustained self-employed

Similar to prior graphs, the y-axis indicates the percentage rates in paid employment, self-employment, unemployment and inactivity, and the dashed area represents the excluded period in the analysis (year 2008 and 2009), during which the crisis occurred. For our group of sustainers, we notice a steep decline in their flow in self-employment during pre-crisis period (dropped from 80 percent in 2003 to 60 percent in 2007), this is countered by an upward and parallel rise in their flow in paid employment (from 12 to 22 percent) and inactivity (from 10 to 17 percent), but more predominantly in the wage sector between the years 2003 and 2007. Whereas their flow in unemployment remained stable at 3 percent before the crisis. The decline of flow in self-employment continued to persist for our sustained self-employed after the crisis (dropped further from 55 percent in 2010 to 47 percent in 2014), where their flow diverted towards paid employment (1 percentage point increase between years 2010 and 2014) and a large exit out of the labour market and into inactivity (from 23 percent in 2010 to 32 percent in

2014), whereas unemployment level among sustainers decreased during post-crisis period (from 2.45 percent in 2010 to 0.47 percent in 2014).

5.4.9.1.2 Dabbled self-employed

The dabbled self-employed also decreased their flow in self-employment during pre-crisis period but by less fraction than the sustained self-employed (5 percentage point decrease compared to 20 percentage point decrease for the sustained self-employed between years 2003 and 2007). Strangely, their flow in paid employment also declined (from 60 percent in 2003 to 55 percent by year 2007), whereas their movement in inactivity ascended (from 10 percent to 15 percent between these years), and unemployment rates remained at its low levels at 5 percent, before crisis. Likewise, we notice a fall in the flow of dabblers in self-employment post-crisis (4 percentage point decrease between 2010 to 2014). This was accompanied by a minor fall in their occurrence in wage employment (from 49 to 46 percent between 2010 to 2014). However, we see a higher rise of flow of dabblers in inactivity (from 19 to 26 percent between years 2010 and 2014), whereas a more stable pattern is found in unemployment during the post-crisis period (between 2 and 3.5 percent).

5.4.9.1.3 Always Employees

We notice in figure 5.11, a rise in the flow for the previously denoted workers as always employees in self-employment, but not ominously during pre-crisis period (4 percentage point increase only between the years 2003 and 2007). Their flow in inactivity has increased too, but at a higher level (10 percentage point increase, between the years 2003 and 2007), whereas their flow in paid employment declined during this period from (90 percent in 2003 to 80 percent in 2007) and their unemployment levels remained relatively low (between 1.94 percent and 1.27 percent). After the crisis, between the years 2010 and 2014 we observe a more severe decline of occurrence of always employees in paid employment (less by 8 percentage points), however their levels in self-employment only increased by a small percentage (1 percentage

point), and their flow in unemployment remained relatively stable (between 2 to 2.5 percent between 2010 and 2014), but higher than the pre-crisis levels. The main rise occurred outside the labour market, where the percentage of always employees observed in inactivity increased from 16 percent in 2007 to 22 percent in 2010 and 8 percentage point more in 2014.

Figure 5.11: Approach 1 Division Flow (BHPS 2003-2007)

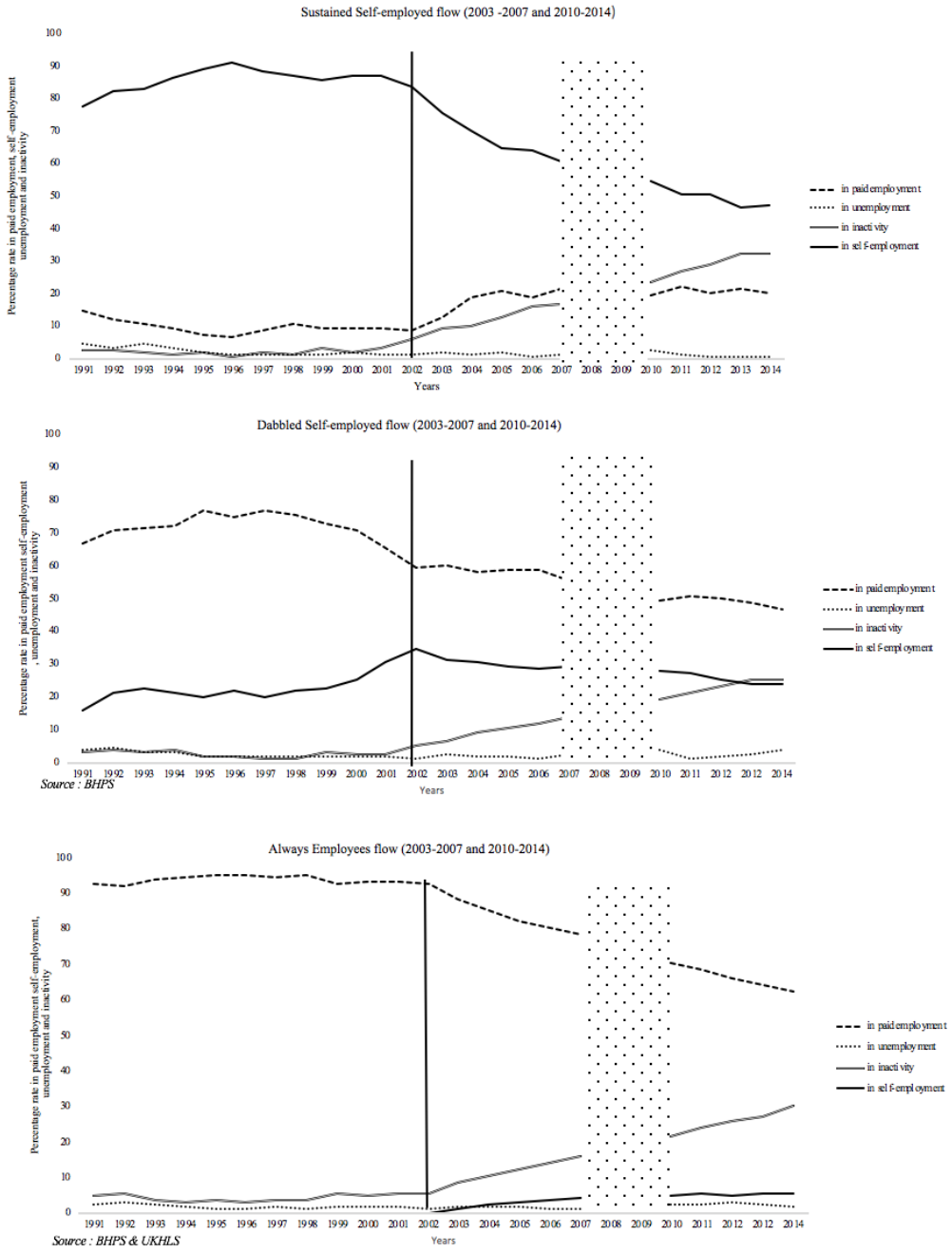
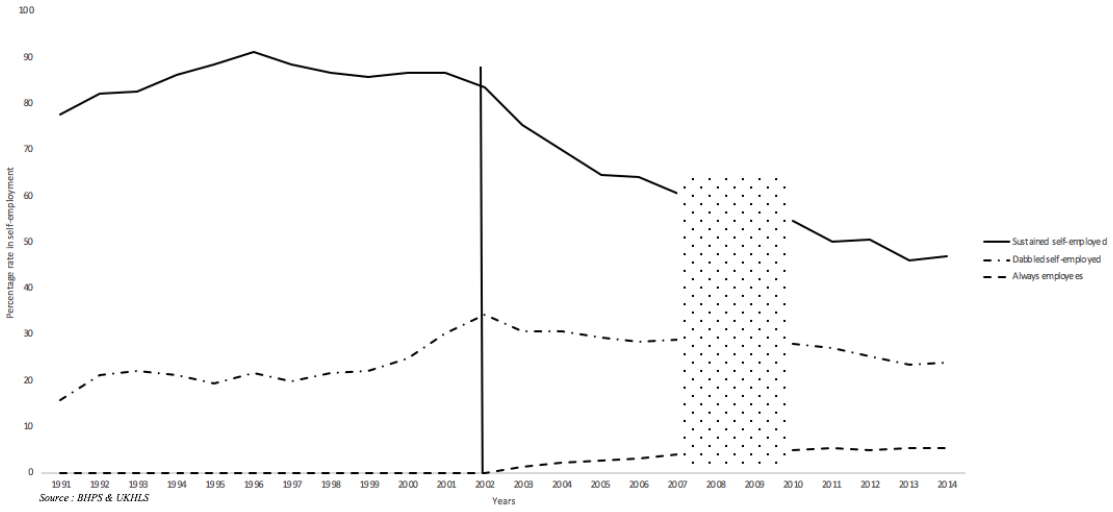


Figure 5.12 below shows only the flow of our re-categorised division of workers in self-employment, between the years 2003 and 2007 and 2010 and 2014. Like what is previously shown in figure 5.11, the flow of sustained self-employed in self-employment sharply declined (from 80 to 60 percent, between years 2003 and 2007) before crisis and further less (from 55 to 47 percent, between years 2010 and 2014) after crisis , as well as the flow of dabbled self-employed in self-employment but not as severe like sustainers (from 32 to 29 percent between years 2003 and 2007 and from 28 to 24 percent, between years 2010-2014). Whereas we witness a stable entry of the previously assigned always employees in self-employment during both periods (from null to 5 percent between years 2003 and 2003 and years 2010 and 2014).

Figure 5.12: Approach 1 Division Flow in Self-employment (BHPS 2003-2007)



5.4.9.2 Approach 2

Following these transitions, we then introduce the graphical presentations of figures 5.13 and 5.14 for our second re-classification, labelled as approach 2 in this study. Approach 2 follows the same partition process as approach 1 and our initial division criteria, but the specification is based on re-categorising the sustained self-employed, the dabbled self-employed and the always employees for an extended period than approach 1, until the year 2007 (hence,

respondents will be at least observed one-third of time (one-third of seventeen waves, from 1991 till 2007) in the sample) prior to the economic downturn. This is graphically shown by the drawn line in figure 5.13 determining the cut off point for our division Similarly, we observe the transition behaviour for our continuing BHPS members in the UKHLS study for five consecutive years, from 2010 to 2014 and analyse their flow in and out of self-employment, after the economic downturn when the economy is still recovering from the effect of the crisis and compare the outcomes with approach 1. Therefore, the people defined for approach 2 are different groups to those defined for approach1, and the comparison between the two approaches is based on the combination of differences in behaviours as well as differences in the people who are defined in each group. The dashed area in both figures also represents the excluded period in the analysis (year 2008 and 2009), during which the crisis occurred. As previously mentioned, the shortcoming in our study is that we have missing data for year 2009, for this reason we decided to exclude both years; 2008 and 2009, as the crisis occurred in the second end of 2008 and at the beginning of 2009. Hence, we chose to observe the transition flow in and out of self-employment for our division of workers, between the years 2010 till 2014, when the economy is still affected by the onset of the 2008-2009 financial crisis and on its way to reclamation. We use this approach only for comparison checks with approach 1 on the changes in the transition behaviours of workers in the labour market after the economic crisis.

5.4.9.2.1 Sustained self-employed

The decline of flow in self-employed continue to persist for our sustained self-employed in figure 5.13 below, between the years 2010 and 2014 (the percentage rate of sustainers in self-employment dropped further from 70 percent to 60 percent). The sustained self-employed, following the economic downturn diverted from self-employment towards wage employment (5 percentage point increase from 2010 to 2014) and largely exited the labour market into

inactivity (15 percentage point increase from 2010 to 2014). Unemployment levels between sustainers were higher than the pre-crisis levels (2.5 percentage point higher), but gradually declined in the observed period.

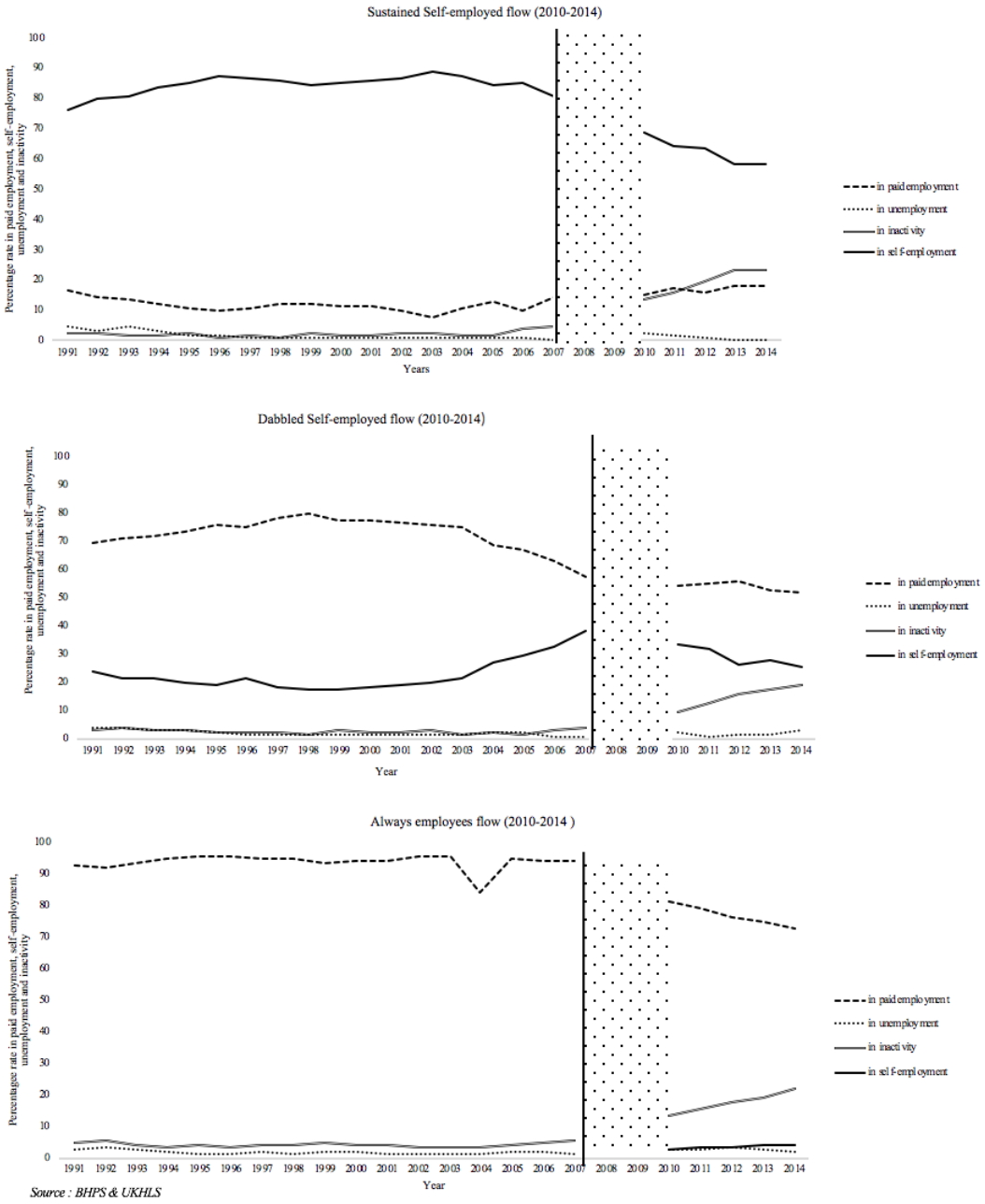
5.4.9.2.2 Dabbled self-employed

Likewise, we notice a fall in the flow of dabblers in self-employment (10 percentage point decrease between 2010 to 2014), too this was accompanied by a minor fall in their occurrence in wage employment (less than 5 percentage point between 2010 to 2014). But we see the rise in their flow in inactivity (10 percentage point increase from 2010 to 2014) and unemployment throughout the period (by less than 4 percentage point between 2010 to 2014).

5.4.9.2.3 Always employees

As for those we previously labelled as always employees, we observe a decline in their flow in paid employment (10 percentage point decrease between 2010 and 2014), accompanied by a noticeable rise in self-employment (5 percentage point increase between 2010 and 2014) and in inactivity (5 percentage point increase between 2010 and 2014). Started with higher rate in unemployment than pre-crisis level (flow in unemployment in year 2007 was 0.96 percent and 2.88 percent in 2010), then gradually declined between years 2010 and 2014 (flow in unemployment decreased to 1.73 percent in 2014).

Figure 5.13: Approach 2 Division Flow (UKHLS 2010-2014)



Source : BHPS & UKHLS

Figure 5.14: Approach 2 Division Flow in Self-employment (UKHLS 2010-2014)

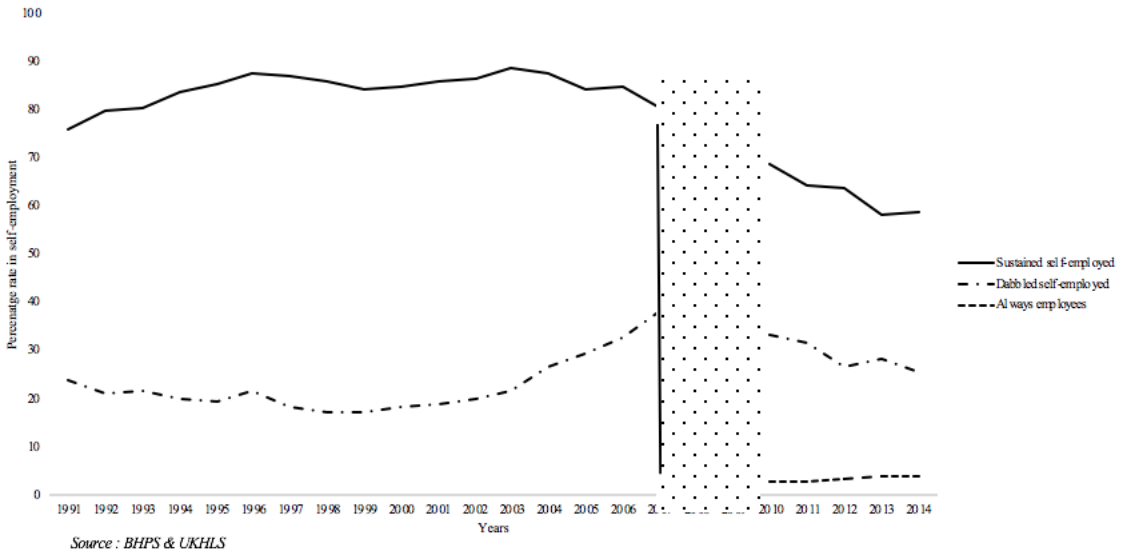


Figure 5.14 also presents the same findings as above, but only looking at the flow of our division of workers in self-employment. As shown in both figures, 5.13 and 5.14, the drop was prevalent for the sustained self-employed, followed by the dabbled self-employed. Nonetheless, we see the rise of a new upcoming trend from the always employees in self-employment but not very high, following the economic downturn (only 5 percentage point increase between 2010 and 2014).

5.4.9.3 Approach 1 versus Approach 2

Hence, both approaches (1 and 2) in the interested post-crisis period (between years 2010 and 2014) exhibit a similar pattern of behaviour for our groups of workers, although the people who are defined in each group are different. This further validates our approach and the results found. Hence for sustainers, there is a noticeable decline in their flow in self-employment, overturned by them exiting the labour market and entering wage employment. A similar scenario is also shown for the dabbled self-employed, however their levels in inactivity are lower than sustainers but higher in unemployment. As for the always employees, we notice in both approaches a rise in self-employment, accompanied with an increase in inactivity levels, reversed by a decline in wage employment and a stable low rate in unemployment.

5.4.10 Transition Matrices for Dabblers

Following these graphical presentations, we focus more on the trends of the dabbled self-employed, especially after the financial crisis by providing supplementary descriptive on their average year-to year transitions between each labour market states, in years 2007, 2010, 2011, 2012, 2013 and 2014, in table 5.4 following approach 1 criteria. As shown in the table 5.4 below, in 2007 we are left with a low number of dabbled self-employed (792 workers), where prior to the economic downturn, we have 238 dabblers in self-employment (around 30 percent), 436 in wage employment (55 percent), 19 in unemployment (2.5 percent) and 99 in inactivity (12.5 percent). We include the raw numbers for year 2007 to show the number of workers distributed in the labour market and to check how the percentages of these dabblers vary in the annual transitions during post-crisis period, whereas after the crisis, the total number of dabblers in self-employment continued to decline (from 30 percent in year 2007 to 27.92 percent in 2010, 27.38 percent in 2011, 25.32 percent in 2012, 23.49 percent in 2013 and 24.29 percent in 2014). Similar, their annual transition in paid employment declined but are still higher than self-employment rates (from 55 percent in year 2007 to 49.57 percent in 2010, 50.60 percent in 2011, 49.68 percent in 2012, 48.99 percent in 2013 and 47.14 percent in 2014). This was then upturned by an overall increase of their annual transitions in unemployment (from 2.5 percent in year 2007 to 3.42 percent in 2010, 0.89 percent in 2011, 1.92 percent in 2012, 2.35 percent in 2013 and 3.57 percent in 2014) and more predominately in inactivity (from 12.5 percent in year 2007 to 19.09percent in 2010, 21.13 percent in 2011, 23.08 percent in 2012, 25.17 percent in 2013 and 25 percent in 2014).

After the economic downturn and in year 2010 we notice around 78.16 percent of our dabblers who were previously in self-employment (238 workers) continued to stay in this job market, the remainder were distributed more predominantly in paid employment (16.09 percent), then unemployment (3.45 percent) and lastly in inactivity (2.30 percent). Following their annual

transition in 2011, we notice higher persistence of dabblers in self-employment (82.11 percent), reversed by a decrease in wage employment (15.79 percent), no presence in unemployment (0 percent), and a decrease in inactivity (2.11percent). The percentages changed in year 2012 and were lower in self-employment (80.25 percent) and in wage employment (12.35 percent) but was reversed by an increase in unemployment (1.23 percent) and inactivity (6.17 percent). In 2013, the pattern changed, where we see a decline in self-employment (78.38 percent), an increase in paid employment (18.92 percent), no presence in unemployment, and a noticeable decline in inactivity (2.70 percent). Whereas in 2014, there is more persistence in self-employment (83.08 percent), a decline in paid employment (10.77 percent) and in increase in unemployment levels (3.08 percent) and inactivity (3.08 percent).

For dabblers previously in paid employment (436 workers), we find that the majority remained in this employment status post-crisis (between 75 to 88 percent in the studied years; 2010 till 2014, remained in paid employment), the rest transited to self-employment, but the rates declined over the years (in 2010, 13.17 percent of dabblers from paid employment transited to self-employment, 5.92 percent in 2011, 7.36 percent in 2012, 7.28 percent in 2013, and 8.76 percent in 2014), followed by inactivity (7.80 percent in 2010, 5.92 percent in 2011, 3.68 percent in 2012, 3.97 percent in 2013, and 2.19percent in 2014) and lastly in unemployment (3.41percent in 2010, 0.59 percent in 2011, 2.45 percent in 2012, 2.65 percent in 2013, and 0.73 percent in 2014).

As for the transitions from unemployment, the percentages vary year-to-year in the labour market states after the crisis, where we could not find a specific pattern for the 19 dabblers nor draw any valid inference of their labour market movement because they are too small in sample size. Whereas, for the 99 dabblers outside the labour market, the majority remains outside the labour force (90 to 92 percent of the sample size continue to be in inactivity between the years 2010 and 2014), only a small percentage throughout the years move into

paid employment and self-employment, but the percentages are much higher into paid employment (3.85 percent of workers outside the labour market enter paid employment and self-employment in 2010; 4.92 percent in self-employment and 3.28 percent in paid employment in 2011, 3.03 percent in self-employment and 4.55 percent in paid employment in 2012, 0 percent in self-employment and 2.94 percent in paid employment in 2013 and 1.43 percent in self-employment and 4.29 percent in paid employment in 2014). Whereas in unemployment the percentages remained very low throughout the years and only increased at the end (1.92 percent in year 2010, 0 percent in 2011 and 2012, 1.47 percent in 2013, and 4.29 in 2014).

From what is shown, the below table 5.4 illustrates self-employment as less stable and preferable state than paid employment for the dabbled self-employed. Hence for those dabbling in paid employment, prior to crisis we see a higher persistence rate and an increase in presence in paid employment, following the economic downturn. The rest are diverting towards self-employment followed by inactivity, but only by a smaller fraction, and lastly in unemployment. And for those previously in self-employment, the highest share continues to stand in this employment status, followed in paid employment, inactivity and lastly in unemployment, between the years 2010 till 2014. Hence from what is shown these workers have more preference towards secure work, especially when the economy is on its way of recovery from the onset of the financial crisis. Perhaps their increase in inactivity could be attributed to either being discouraged from the labour market, choice to retire, or to ride out the economic downturn and continue with their formal education. Hence, we check if this last speculation is viable in our data, if dabblers are exiting the labour market to continue their education, by looking at the changes in their years of education and earnings returns before and after crisis for our group of workers in approach 1, in the following section of this chapter.

Table 5.4: Average Year to Year Transition Matrix for Self-employed Dabblers, using Approach 1, after the recession (BHPS year 2007; UKHLS years 2010-2014), Average Row Percentages

Labour market status at 2007	*Labour market status at 2010*					*Labour market status at 2011*					*Labour market status at 2012*					*Labour market status at 2013*					*Labour market status at 2014*				
Dabbled Self-employed using approach1	Self-employment	Employment	Unemployment	Inactivity	Total	Self-employment	Employment	Unemployment	Inactivity	Total	Self-employment	Employment	Unemployment	Inactivity	Total	Self-employment	Employment	Unemployment	Inactivity	Total	Self-employment	Employment	Unemployment	Inactivity	Total
Self-employment *(238 workers)*	78.16%	16.09%	3.45%	2.30%	100.00%	82.11%	15.79%	0.00%	2.11%	100.00%	80.25%	12.35%	1.23%	6.17%	100.00%	78.38%	18.92%	0.00%	2.70%	100.00%	83.08%	10.77%	3.08%	3.08%	100.00%
Employment *(436 workers)*	13.17%	75.61%	3.41%	7.80%	100.00%	5.92%	87.57%	0.59%	5.92%	100.00%	7.36%	86.50%	2.45%	3.68%	100.00%	7.28%	86.09%	2.65%	3.97%	100.00%	8.76%	88.32%	0.73%	2.19%	100.00%
Unemployment *(19 workers)*	14.29%	42.86%	14.29%	28.57%	100.00%	9.09%	45.45%	18.18%	27.27%	100.00%	0.00%	50.00%	50.00%	0.00%	100.00%	20.00%	0.00%	40.00%	40.00%	100.00%	12.50%	12.50%	50.00%	25.00%	100.00%
Inactivity *(99 workers)*	3.85%	3.85%	1.92%	90.38%	100.00%	4.92%	3.28%	0.00%	91,80%	100.00%	3.03%	4.55%	0.00%	92.42%	100.00%	0.00%	2.94%	1.47%	95.59%	100.00%	1.43%	4.29%	4.29%	90.00%	100.00%
Total *(792workers)*	27.92%	49.57%	3.42%	19.09%	100.00%	27.38%	50.60%	0.89%	21.13%	100.00%	25.32%	49.68%	1.92%	23.08%	100.00%	23.49%	48.99%	2.35%	25.17%	100.00%	24.29%	47.14%	3.57%	25.00%	100.00%

Source: BHPS & UKHLS

5.4.11 Summary Statistics and Earnings Regressions

Observing only the trends with the year-to-year transitions do not entail much on the reasons behind such deviations for our division of workers, especially in inactivity between the different specified periods of time (pre and post-crisis). Therefore, we introduce table 5.5 to examine the differences in the socio-economic and demographic characteristics of our workers in approach 1 and table 5.6 to look at the changes only in the accumulated years of education variable for workers between the two specified period for approach 1(pre-crisis between years 2003 and 2007 and post-crisis, between years 2010 and 2014). This is then followed by the computation of their earnings returns in table 5.7, and the comparison of earnings returns estimates for our group of workers in approach 1 (years 1991 till 2002), and between pre and post-crisis periods (years 2003 till 2007, and years 2010 till 2014) in tables 5.8 and 5.9.

Table 5.5: Approach 1 Division Summary Statistics (years 1991 till 2002).

	Sustainers		Dabblers		Wage earners		t-tests of equal means		
	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.	Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Gross hourly pay	9.686	16.487	9.202	10.000	8.499	6.629	0.439	0.000	0.000
Years of Education	12.553	2.823	12.725	2.740	12.624	2.718	0.000	0.000	0.047
Work experience	28.270	11.535	23.316	11.346	22.596	11.878	0.000	0.000	0.000
Full time	0.856		0.839		0.818		0.069	0.000	0.000
Second job	0.097		0.142		0.080		0.000	0.000	0.000
Age	45.994	10.996	41.099	10.980	40.388	11.317	0.000	0.000	0.000
female	0.202		0.320		0.501		0.000	0.000	0.000
married/cohabitting	0.841		0.805		0.760		0.000	0.000	0.000
partner working	0.627		0.667		0.643		0.000	0.000	0.000
has child	0.398		0.420		0.389		0.000	0.026	0.000
child below 16	0.089		0.130		0.195		0.000	0.000	0.410
disabled	0.034		0.028		0.041		0.703	0.036	0.034
Non-UK native	0.066		0.058		0.043		0.197	0.000	0.000
non-white	0.034		0.024		0.021		0.685	0.000	0.000
English language	0.816		0.908		0.847		0.000	0.000	0.000
father self-employed	0.262		0.195		0.133		0.000	0.000	0.000
mother self-employed	0.077		0.064		0.038		0.000	0.000	0.000
other household income	3071.707	2611.127	3087.528	2081.553	2928.247	1665.673	0.000	0.017	0.000
employs workers	0.300		0.057		0.002		0.000	0.000	0.000
hours worked per week	45.561	16.959	41.195	14.433	38.701	12.491	0.000	0.000	0.000
start own business	0.094		0.087		0.081		0.000	0.001	0.000
give up paid work	0.124		0.176		0.216		0.000	0.000	0.000
person-year observation	8,054		7,065		73,562				
number of workers	1,404		792		11,184				

Source: BHPS

Table 5.6: Approach 1 Summary Statistics pre-crisis (years 2003-2007) and post-crisis (years 2010-2014) periods.

	Sustainers				Dabblers				Wage earners			
	Pre-crisis (years 2003-2007)		Post-crisis (years 2010-2014)		Pre-crisis (years 2003-2007)		Post-crisis (years 2010-2014)		Pre-crisis (years 2003-2007)		Post-crisis (years 2010-2014)	
	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.	Mean	Sd dv.
Years of Education	12.816	2.815	14.850	2.824	12.836	2.647	15.053	2.895	12.832	2.678	15.038	2.692
person-year observation	2,168		2,168		1,263		1,263		15,223		15,223	
number of workers	1,404				792				11,184			

Source: BHPS & UKHLS

Table 5.7: Main Earnings Division Regressions for Approach 1 (years 1991 till 2002)

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.069***	0.145***	0.000	0.079***
	(0.002)	(0.013)	(.)	(0.002)
educ * sustainers	-0.008	0.009	0.000	-0.010
	(0.010)	(0.034)	(.)	(0.010)
educ * dabblers	-0.006	0.003	0.000	-0.014
	(0.008)	(0.044)	(.)	(0.008)
sustained self-employed	-0.136	-0.357	0.000	-0.240
	(0.128)	(0.428)	(.)	(0.126)
dabbled self-employed	0.018	-0.097	0.000	0.095
	(0.097)	(0.568)	(.)	(0.103)
Age	0.050***	0.035***	0.111***	0.075***
	(0.004)	(0.005)	(0.004)	(0.003)
Age squarred	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.172***	-0.177***	0.000	-0.208***
	(0.014)	(0.016)	(.)	(0.013)
Married/Cohabitting	0.051**	0.061**	0.027	0.013
	(0.019)	(0.022)	(0.014)	(0.013)
Partner employed	-0.000	-0.003	-0.001	0.010
	(0.014)	(0.016)	(0.010)	(0.010)
Full time job	0.095***	0.055**	-0.168***	-0.085***
	(0.015)	(0.018)	(0.016)	(0.014)
Has second paid job	-0.052***	-0.068***	-0.025*	-0.039***
	(0.014)	(0.017)	(0.010)	(0.010)
Has children	0.064***	0.064***	0.026*	0.046***
	(0.015)	(0.018)	(0.012)	(0.011)
Responsible for dependent child under 16	-0.075***	-0.075**	-0.076***	-0.078***
	(0.020)	(0.023)	(0.017)	(0.016)
considered disable	0.023	0.069	0.042	0.073**
	(0.035)	(0.040)	(0.028)	(0.027)
Non-UK native	-0.047	-0.147**	0.000	-0.082*
	(0.037)	(0.046)	(.)	(0.033)
English first language	0.025	0.054*	0.000	-0.024
	(0.021)	(0.024)	(.)	(0.018)
Non-white	-0.020	-0.070	0.000	-0.015
	(0.054)	(0.067)	(.)	(0.049)
λ	0.090***	0.077***	0.008	0.061***
	(0.008)	(0.009)	(0.006)	(0.007)
Constant	-0.159*	-0.888***	-1.118***	-0.780***
	(0.068)	(0.149)	(0.082)	(0.063)
R^2 (overall model)	0.217	0.076	0.296	0.166
educ				
1st stage F statistic		65.3416		
Shea`s Partial R^2		0.1017		
educ * sustainers		17.9925		
1st stage F statistic		0.9527		
Shea`s Partial R^2				
		6.1378		
educ * dabblers		0.9521		
1st stage F statistic				
Shea`s Partial R^2				
person-year observations	37408	37408	37408	37408

Source: BHPS, years (1991-2002)

Notes: Standard errors are robust to heteroscedasticity and clusterd at the individual level . Instrumental estimation (S2) with endogenous variable Education and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the *selection correction term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 5.8: Main Earnings Division Regressions for Approach 1 (years 2003-2007)

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.068***	0.133***	0.000	0.072***
	(0.002)	(0.013)	(.)	(0.002)
educ * sustainers	-0.007	0.010	0.000	-0.016
	(0.011)	(0.035)	(.)	(0.011)
educ * dabblers	0.009	0.047	0.000	0.005
	(0.010)	(0.063)	(.)	(0.010)
sustained self-employed	-0.164	-0.390	0.000	-0.091
	(0.143)	(0.451)	(.)	(0.146)
dabbled self-employed	-0.158	-0.632	0.000	-0.142
	(0.122)	(0.798)	(.)	(0.125)
Age	0.039***	0.024***	0.087***	0.048***
	(0.004)	(0.005)	(0.008)	(0.004)
Age squarred	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.173***	-0.179***	0.000	-0.219***
	(0.014)	(0.015)	(.)	(0.014)
Married/Cohabitting	0.050*	0.062**	0.017	0.029
	(0.021)	(0.023)	(0.023)	(0.018)
Partner employed	0.004	-0.006	-0.003	-0.001
	(0.018)	(0.019)	(0.015)	(0.013)
Full time job	0.050**	0.032	-0.204***	-0.114***
	(0.016)	(0.018)	(0.021)	(0.016)
Has second paid job	-0.013	-0.035	0.031	0.013
	(0.019)	(0.021)	(0.017)	(0.015)
Has children	0.056**	0.033	0.014	0.031*
	(0.017)	(0.020)	(0.018)	(0.014)
Responsible for dependent child under 16	-0.040	-0.043	-0.038	-0.046*
	(0.022)	(0.024)	(0.027)	(0.019)
considered disable	-0.034	-0.004	0.023	-0.004
	(0.027)	(0.030)	(0.022)	(0.020)
Non-UK native	-0.033	-0.123**	0.000	-0.034
	(0.036)	(0.043)	(.)	(0.036)
English first language	0.104***	0.115***	0.000	0.091***
	(0.019)	(0.020)	(.)	(0.018)
Non-white	0.012	-0.046	0.000	0.006
	(0.060)	(0.068)	(.)	(0.060)
λ	0.028**	0.028*	0.001	0.025**
	(0.011)	(0.011)	(0.010)	(0.010)
Constant	0.346***	-0.170	-0.526**	0.233**
	(0.078)	(0.144)	(0.175)	(0.075)
R^2 (overall model)	0.188	0.081	0.066	0.172
educ				
1st stage F statistic		68.6321		
Shea`s Partial R^2		0.0946		
educ * sustainers		19.9852		
1st stage F statistic		0.9545		
Shea`s Partial R^2				
educ * dabblers				
1st stage F statistic		4.69269		
Shea`s Partial R^2		0.9553		
person-year observations	22773	22773	22773	22773

Source: BHPS, years (2003-2007)

*Notes: Standard errors are robust to heteroscedasticity and clusterd at the individual level . Instrumental estimation (S2) with endogenous variable Education and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-*employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction *term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 5.9: Main Earnings Division Regressions for Approach 1 (years 2010-2014)

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.067***	0.163***	0.003	0.066***
	(0.004)	(0.026)	(0.025)	(0.004)
educ * sustainers	-0.005	0.044	-0.087	-0.003
	(0.020)	(0.097)	(0.093)	(0.020)
educ * dabblers	-0.002	-0.058	0.103	0.005
	(0.016)	(0.082)	(0.058)	(0.016)
sustained self-employed	-0.006	-0.755	0.000	-0.024
	(0.306)	(1.457)	(.)	(0.295)
dabbled self-employed	0.014	0.855	0.000	-0.076
	(0.236)	(1.253)	(.)	(0.231)
Age	0.037***	0.008	0.019	0.037***
	(0.011)	(0.013)	(0.076)	(0.011)
Age squarred	-0.000**	-0.000	-0.000	-0.000**
	(0.000)	(0.000)	(0.001)	(0.000)
Female	-0.181***	-0.185***	0.000	-0.179***
	(0.029)	(0.032)	(.)	(0.028)
Married/Cohabitting	-0.178*	-0.208**	-0.270	-0.183*
	(0.074)	(0.080)	(0.343)	(0.074)
Partner employed	0.244***	0.254**	0.275	0.251***
	(0.072)	(0.078)	(0.331)	(0.072)
Full time job	0.057	0.039	-0.345	0.033
	(0.031)	(0.036)	(0.178)	(0.031)
Has second paid job	-0.017	-0.061	0.166	0.002
	(0.040)	(0.046)	(0.122)	(0.041)
Has children	0.102**	0.050	0.051	0.081**
	(0.033)	(0.040)	(0.125)	(0.031)
Responsible for dependent child under 16	-0.040	-0.060	-0.242	-0.034
	(0.042)	(0.047)	(0.159)	(0.040)
considered disable	0.061**	0.044	-0.062	0.047*
	(0.020)	(0.023)	(0.045)	(0.019)
Non-UK native	-0.058	-0.201*	0.000	-0.039
	(0.069)	(0.082)	(.)	(0.071)
English first language	0.103	0.085	0.000	0.084
	(0.058)	(0.062)	(.)	(0.060)
Non-white	0.070	0.019	0.000	0.056
	(0.091)	(0.107)	(.)	(0.093)
λ	-0.285*	-0.450***	-0.037	-0.093
	(0.120)	(0.134)	(0.105)	(0.096)
Constant	0.410	-0.225	1.949	0.425
	(0.237)	(0.308)	(1.857)	(0.235)
R^2 (overall model)	0.179	0.112	0.086	0.178
educ				
1st stage F statistic				
Shea`s Partial R^2		26.8205		
		0.0925		
educ * sustainers				
1st stage F statistic		6.05288		
Shea`s Partial R^2		0.9651		
educ * dabblers		3.8878		
1st stage F statistic		0.9628		
Shea`s Partial R^2				
person-year observations	12773	12773	12773	12773

Source: BHPS & UKHLS , years(2010-2014)

Notes: Standard errors are robust to heteroscedasticity and clusterd at the individual level . Instrumental estimation (S2) with endogenous variable Education and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the *selection correction term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

5.4.11.1 Summary Statistics

In table 5.5 we do not observe much change regarding worker's socio-economic and demographic characteristics between approach 1 and our initial division. As previously shown

(in chapter 4 of this thesis), the sustained self-employed are older, more experienced, full-timers, work on average more hours per week, employ workers, married, more male oriented, come from non-UK background, non-white, and have their parents previously working as self-employed, followed by the dabbled self-employed and lastly by the always employees. The always employees have more female and disabled participation, are responsible for dependent children below the age of 16, would like to give up their paid work, followed by dabblers and lastly sustainers. The dabbled self-employed report English to be their first language, have partners working more than the always employees, have children, work in second jobs and report higher household income than the sustained self-employed and always employees.

The difference between workers is only noticeable regarding deflated hourly gross pay and the motivation to start own work. In our established division (in table 4.2 in chapter 4) dabblers report the highest hourly deflated gross pay, while in approach 1, the sustained self-employed are the ones that report higher earnings, followed by dabblers and lastly by the always employees. As for workers reporting they would like to start their own work, in approach 1, sustainers have the highest percentage followed by dabblers, then employees. Whereas in our initial division, the dabbled self-employed report the highest percentages in wanting to start their own work, followed by the sustained self-employed and lastly the always employees.

Concerning the years of education, the statistics between approach 1 in table 5.5 and our initial division do not change, where dabblers report the highest numbers of accumulated years of education, followed by the always employees and lastly by sustainers. We introduce table 5.6 for approach between pre-crisis (years 2003 till 2007) and post-crisis periods (years 2010 till 2014) to monitor any changes in the accumulated years of education. The results show that on average our group of workers report higher number of accumulated years of education post-crisis. The results in table 5.6 show during pre-crisis years sustainers report on average

12.816, dabblers 12.836 and always employees 12.832 years of accumulated years of education. After crisis, the statistics increase to 14.850 average years of accumulated years of education for sustainers, 15.053 for dabblers and 15.038 for the always employees, however the highest increase occurred for the dabbled self-employed. Hence, this speculates that some of our workers who exited the labour market during post-crisis years (2010 till 2014), when the economy is still recovering from the effect of the crisis, have continued their education to override the crisis.

5.4.11.2 Earnings Regressions

Moving further with the regression results in table 5.7 for approach 1 (years 1991 till 2002), table 5.8 during pre-crisis time (years 2003 till 2007) and table 5.9 during post-crisis time (years 2010 till 2014) and comparing with the findings for our initial division in table 4.6 in chapter 4 of this thesis, we find that the returns to formal education are significantly higher for the always employees then both subgroups of self-employed. The results are similar to what has been previously established, when looking at the IV estimates in all tables.

Also, in post-crisis period, the IV estimates on the earnings returns are higher for the always employees (16.3 percentage point increase, significant at 1 percent significance level) than the pre-crisis levels in tables 5.7 (IV estimates equal to 14.5 percentage point increase in earnings returns in approach 1 for the always employees during years 1991 till 2002) and 5.8 (IV estimates equal to 13.3 percentage point increase in earnings returns in approach 1 for always employees during pre-crisis years 2003 till 2007). But we could not identify any significant higher returns for both subgroups of self-employed in all three tables, although the estimates found point toward this direction except the ones during post-crisis period. Where the estimates on the education coefficient variable with the interaction with the dabbled self-employed dummy variable show negative percentage point difference values, but are insignificant.

What is different is that we notice that the FE specifications in tables 5.7 and 5.8 do not report any values for the years of education coefficients and their interaction with the sustained and dabbled self-employed dummy variables. This implies that the years of education variable is time-invariant and eliminated from the FE model. Whereas the regression results for our main division report varying years of education for the FE model, as well in table 5.9 for approach 1 workers during post-crisis period only. Hence this confirms well with the summary statistics findings in table 5.6 above, where we notice on average an increase in the accumulated years of education variable for our group of workers after crisis.

The FE specification in our initial findings shows decreasing returns for our always employees with varying years of education over time (by a significant 1 percentage point in table 4.6). However, opposite results are shown in table 5.9, between the years 2010 and 2014, where the estimates on the education variable show increasing earning returns for the always employees (by 3 percentage points), however the values are insignificant. As for sustainers, our initial findings show that their earnings returns are higher than always employees by 2.7 percentage point difference, but we were unable to establish any significant results. Whereas, dabblers have significant decreasing and lower returns than the always employees by significant 4.8 percentage point difference, at 99 percent confidence level in the (s3) specification of table 4.6 in chapter 4 of this thesis. Opposite results are shown in table 5.9 for our workers in approach 1 during post-crisis period, as sustainers are shown to have lower earnings returns for their varying years of education in the FE model than the always employees (less by 8.7 percentage point difference) and higher returns for dabblers (by 10.3 percentage points difference), however the values are insignificant. Thus, we could not draw any valid inference on the results found, nor establish any significant higher returns for both subgroups of self-employed in our initial findings (similar to the results in table 4.6 in chapter 4 of the thesis).

5.4.12 Discussion

5.4.12.1 Sustained Self-employed

From what is explained and demonstrated in the above diagrams and tables, we find that the sustained self-employed are not well embedded in self-employment as we expect them to be. We have noticed a steep decline in their flow and persistence in self-employment throughout both periods of time, when the economy is booming and when it is affected and still on its recovery from the onset of the 2008-2009 financial crisis. Their decline is backlashed by their entry in paid employment and inactivity, especially between the years 2010 till 2014. Whereas their levels in unemployment were kept low at most time. This tells us that these workers are not motivated to find work and for such reason they choose to exist the labour market. Their characteristics reveal that they are on average older than the dabbled self-employed and the always employees, as such their exit may be also attributed to retirement from work. Their decreased returns, following the crisis could explain that these workers are either getting lower pay as to what they previously have been making or might be downgrading in a way and taking less skilled and paid work instead of being unemployed, regardless of the increase in the accumulated years of education for some after crisis. However, future work is needed to focus on the changes in the industry and occupation levels from the shift of sustainers from self-employment towards paid employment to validate this last view, as the statistics presented do not have any significant value.

5.4.12.2 Dabbled Self-employed

Moving to our group of dabblers, the findings reveal that these group of people behave differently than the sustained self-employed. Although their inflow over time is decreasing in self-employment in both periods, they persist much longer than the sustained self-employed. This might imply that they might be the younger and more established version of the sustained self-employed. Perhaps they have more corporate knowledge and experience than the sustained

self-employed, as they are spotted more in paid employment and their prior company experience might help them to overcome labour market challenges and survive longer in self-employment. First, we might think that their rise in self-employment could be explained by the entry of workers "freelancing" for a while as they look for paid work, but their persistence in self-employment even after the economic downturn changed our perspective, where we find these specific workers have deliberately chosen to be in self-employment and were able to sustain, even during difficult economic conditions. Hence, relating to the propensity pull model and not to the recession-led hypothesis.

Nevertheless, they still show greater tendency to stay in paid employment rather than self-employment. But, we also notice their fall in paid employment, in both periods, and rise in inactivity. Whereas, their entry in unemployment are lower in period when the economy is at its surge and higher when it still affected by the crisis. This tells us that during the years 2003 to 2007, not many dabblers were looking for work, instead some left the labour force to acquire more education as this is shown by the increase in their reported years of education in table 5.6 during post-crisis period. After crisis, we see a noticeable increase in workers looking for work, implying that the crisis affected these workers, and maybe their decrease in paid employment was not intentional, although they report higher earnings returns than the always employees and the sustained self-employed, but the results are insignificant. This might be because these workers are agile, as they move from one state to another, their contribution and returns are not well measured in each labour market status.

5.4.12.3 Always Employees

As for the previously seen workers only in paid employment, we notice that they have much higher persistence in paid employment than the previous two subgroups of self-employed and their returns have increased after the crisis, along with their accumulated years of education. We notice lower returns, during the years 2003 till 2007, in which this period was characterised

by the rise of the Gig economy and part-time jobs that negatively affected traditional paid work. For a smaller proportion of paid workers, we observe their rise in self-employment prior to the economic downturn, and a little bit more after the effect of the crisis. Like this, we might witness the ascent of smaller and younger version of dabblers, but mainly negatively motivated because their progress mainly existed and accelerated after the effect of the crisis. The period was also accompanied by higher labour market exit rate in both times, that might be explained either by the exit of some workers to continue their education or the retirement of older groups, as unemployment rates continued to be low at most times.

5.5 Conclusion

Accordingly, our findings reveal that our data follow the same pattern as the ONS and LFS findings, but the percentages are much smaller and does not explicitly show the rise in self-employment after the economic downturn. Because the compared studies have much wider coverage of the UK market, and follow different labour market classification than our surveys. The limitation here is that we are bounded in observing the same people for certain years, and the rise might be attributed to new labour market entrants in which our surveys are unable to depict.

Referring to our initial division and approach 1 used in this chapter, the results show that the sustained self-employed do not seem to be well embedded in self-employment as we expected them to be. Their flow continued to decline in self-employment in both period of times, when the economy is booming and when it is still affected by the onset of the crisis. This was reversed by their entry in paid employment and exit out of the labour market, whereas their unemployment levels continued to be low at most times.

As for our dabblers, the outcomes reveal that these group of workers behave differently than the sustained self-employed. Even though we witness a decline in their flow in self-employment in both periods, they persist much longer in self-employment than the sustained

self-employed. Still they show greater propensity towards paid employment rather than self-employment, but we also notice their fall in paid employment in both periods and their rise in inactivity. Their unemployment levels were low in periods when the economy is at its surge and higher after the economic downturn. As for the always employees we see much higher perseverance in paid employment than the two subgroups of self-employed, but for a smaller fraction we observe their rise in self-employment prior to the economic downturn, and more after the effect of the crisis.

Analysis of characteristics and earnings returns show that sustainers are on average older and report lower returns, especially after the crisis. This imply that the older groups might have exited self-employment because of retirement, whereas other might have been demotivated and became inactive. The lower returns, following the crisis could also imply that that these workers are getting lower pay and perhaps have been downgrading to less skilled wage jobs instead of entering unemployment. However, we are unable to follow this reasoning as the estimates found do not hold significant values. Workers in between both labour markets (the dabbled self-employed) report an average increase of the accumulated years education and higher earnings returns than the always employee and the sustained self-employed, especially after the crisis (in comparison with the pre-crisis levels), but the values are insignificant. We would think at first that their rise in self-employment is just a temporary state to find secure wage employment, but their higher persistence after the economic downturn, even with their lower returns reveals that these workers have intentionally chose to be in self-employment. Also, their rise in their years of education over time imply that these workers have opted out of the labour market to advance their education and not because they were demotivated. Still, it is difficult to analyse the estimates for this group of workers, as their agile way of work do not help us measure well their returns in each labour market state. Oppositely, the always employees report lower returns when the economy is buoyant. This is conceivable as the period

was characterised by the emergence of the gig economy that negatively affected traditional paid employment and shifted some to freelancing. Following the crisis, we find higher reported years of education, earnings and higher returns to years of education, hence exposing more stability in this type of work, but we also find a smaller group of people entering self-employment. Thus, again the rise of the dabbling form, but we would attribute this to push and negative reasons.

The findings do not give us definite conclusion on whether our division of workers helps us explain the growth that occurred in self-employment, following the economic downturn. Our answer is maybe that new individuals arriving in the labour market are the ones that mainly affected the growth in self-employment, and the rise mainly occurred in part-time jobs, whereas in our study we were unable to depict this. But the results do tell us that there are three groups of workers apparent in our data; the sustained self-employed, the dabbled self-employed and the always employees, these workers are distinct in the way they behave in the labour market, in their response to shocks, in their observed economic characteristics and earnings returns. As again, the results for the dabblers do not fail to surprise us, showing how unique they are in the labour market.

Chapter 6 – Conclusion

6.1 Overview

This study examines self-employed individuals in the UK labour market and attempts to create a new division in self-employment that differentiates between those who sustain and those who dabble in and out of self-employment and paid employment. The aim is to create a new categorisation that represents the actual scene in the labour market, to help unravel the ambiguity in the previous established divisions between self-employment and paid employment, in regard to the observed socio-economic and demographic characteristics, earnings returns and transitions behaviours of self-employed workers over time.

We carry out the work using combination of surveys, the British Household Panel Surveys (BHPS) interviewing UK respondents from 1991 until 2008, and its successor, the United Kingdom Household Longitudinal Study (UKHLS), following the same members throughout an extended period, from 2010 to 2014. We observe respondents in the labour market for twenty-three years and identify three categories of workers: those who we consider as 'sustaining' in self-employment; those who 'dabble' in self-employment [switching between self-employment and employee jobs] and those who are employees. The identification is based on the observation of the transition behaviour of workers in and out of self-employment over the time seen in the sample, the frequency of observations in each labour market, and the proportions in self-employment and paid employment with respect to total employment time. We exclude respondents who we observe for less than one-third of the time in the dataset, because no solid evidence could be provided over their occupational choice history. Also, respondents with more than two spells of inactivity and/or unemployment are excluded from the study for us to not question the motives behind their choice of work, and for our division to not be driven by these spells of unemployment and inactivity. Our sample consists of 1,146

sustainers (9.83 percent), 1,149 dabblers (9.85 percent) and 9,362 paid employees (80.32 percent).

We define dabblers as workers between these two labour market states; self-employment and paid employment, workers who engage in self-employment for a short period of time and then switch to paid employment and vice versa. We relate them to Weber's (1930) disadvantaged theory and Light's (1972) cultural theory and see them as negatively motivated workers who cannot maintain long in self-employment, nor secure paid work. Hence, we consider them to be disadvantaged in the labour market and are more likely to resemble the misfit workers with respect to their observed attributes, have lower earnings returns to formal education because of their lower control over own human capital. Also, we expect them to switch in self-employment during periods of decline in the economic conditions, implying that they are pushed into self-employment and perceive this type of work as a temporary phase to later ensure wage employment.

Sustainers are workers who we observe longer in self-employment, consider more established and pulled into this form of work than dabblers, are more likely to have aligned attributes with self-employment and are more advantaged than self-employed dabblers. We believe that they are entrepreneurs rather than self-employed by being the highly skilled labour force, with respect to industry and occupational levels and human capital accumulation. Based on the extension of the personal control theory, by Fossen and Buttner (2013), we expect them to enjoy higher earnings returns to formal education than paid employees because they have better control over the use of their own human capital, as they are not bound by firms' regulations and constraints, and than dabblers, because they are more established and have

planning advantages, hence, we predict a higher endurance for them in self-employment, even when the economy is in a downturn.

We argue that this distinction sheds new light on the growth of self-employment over recent decades, where the increase in the UK is slightly idiosyncratic at an international level. This information helps us understand the role of self-employed in the economy, with the most challenging factor looking at the issue of their security and longevity in this type of employment. The idea of dabblers and sustainers is important in a modern economy where the notion of portfolio workers and contemporary careers is becoming increasingly significant and more apparent. Thus, the aim behind differentiating between these groups of workers is to capture a new contemporary form of work in a more refined manner than the simple employment versus self-employment dichotomy and that falls into the grey area between these two labour market states. We provide key insights into a group [*Dabblers*] who have not been separately identified in the labour market to date. We offer a better proximity that presents the actual scene in the labour market and provide new microeconometric evidence on the heterogeneity of returns in self-employment, where the earnings returns suffer from potential bias of what we truly expect the values to be from being a self-employed as opposed to being a paid employee, as these workers are different within each other and from one another. Furthermore, we study the transition behaviours of workers over time, before and after the economic downturn, to study the impact of recession on behaviours and to raise awareness of policy makers on this unique dabbling form of work. We shed important new light on the nature of self-employment in the UK and the growth that occurred over recent decades, to help understand the role of the self-employed in the economy and raise the awareness of policy makers to understand the changes in the world of work and the unique dabbling form of work

to help ensure the relevant regulations and policies for all workers, notwithstanding what form of work they engage in.

The first two chapters of this thesis are the introduction and literature chapters, where we identify the gaps in the literature, the motivation behind our work, our contribution and aims and objectives. We then explore the role of the self-employed and entrepreneurs in the economy and the link to economic growth. We look at the factors affecting the entry into self-employment, and the different distinctions made within self-employment and between paid employment. We also revise the important theories implemented with respect to the divisions in self-employment and to the computation of earnings returns to human capital. In later empirical chapters, we focus on more specific studies in relation to the purpose of our analysis, like the divisions with regards to the 'push' and 'pull' model, and the opportunity and necessity entrepreneurs, Weber's (1930) disadvantaged theory and Light's (1972) cultural theory in chapter 3. Then, the human capital theory by Becker (1962) and Schultz (1963), the screening/signalling hypothesis by Spence (1973), the personal control theory by Van der Sluis and Van Praag, (2004, 2007), and Douhan and Van Praag (2009), the extended personal control theory by Fossen and Buttner (2013), and the heterogeneity of earnings returns to education between the self-employed and employees in chapter 4.

Finally, in chapter 5, we examine the structure of the UK economy, the structural changes in the labour market in relation with the Gig economy, the onset of the 2008 financial crisis on the labour market, the policies in response to the crisis, and the flow of workers in and

out of self-employment in the UK labour market, linking all the findings with our own established division and the motivation behind our work.

6.2 Findings

6.2.1 Division and Characteristics of Workers

The first empirical chapter of this thesis (chapter 3) sets out the criteria for division of individuals into self-employed sustainers, self-employed dabblers and paid employees, and explains attentively how the division criteria is identified and the rationale behind it. In this chapter, we explore the socio-economic and demographic characteristics and look at the propensity of characteristics for the 'amalgamated' group of self-employed and paid employees, without considering any heterogeneity within or among these group of workers in our data, and then we compare with the findings of our own division. We use the Multinomial Logit Model to identify the respective socio-economic and demographic characteristics for self-employed sustainers, self-employed dabblers and paid employees, to check which group of workers have more aligned attributes with self-employment and paid employment, and we test four sets of hypotheses.

In hypothesis 1, we argue that dabblers are different from self-employed sustainers with respect to their observed socio-economic and demographic characteristics, because unlike them they do not engage for long in self-employment. In hypothesis 2, we align dabblers to paid workers with respect to their observed attributes, but stress on their disadvantages more, as they are unable to endure or secure paid work. Hypothesis 3 stresses that self-employed sustainers are different from paid workers and hypothesis 4 claims that sustainers are more

advantaged than dabblers with respect to their embedment in self-employment, social status wellbeing, along with skills levels and qualifications.

Our findings reject partially hypotheses 1 and 2, where those who we consider dabbling in self-employment and paid employment exhibit unique sets of attributes. Surprisingly, they are more advantaged (not from ethnic minority) than employees and are better off (with respect to their human capital accumulation and skill levels) than paid workers and self-employed sustainers in the labour market. The dabbled self-employed are more likely to be male, from white ethnic background, are UK nationals, consider English to be their first language, middle aged workers, report better health conditions, less likely to be or consider themselves as disabled, have higher educational qualifications, higher degree of achievements and A-levels, work in higher skilled industries and report better job satisfaction, own their homes (either by mortgage or outright) as opposed to renting and with both parents previously self-employed rather than paid workers. Also, they are more skilled than the sustained self-employed, with respect to their years of education, qualifications and skill levels, but are not well embedded in self-employment like the latter group.

Hypothesis 3 is fully supported, whereby the sustained self-employed are different from paid workers in all observed aspects. The results show that the sustained self-employed have more closely aligned attributes to self-employment, have similar characteristics to the amalgamated group of self-employed. Where, they are on average older, more male oriented, from non-white ethnic background, non-UK, and non-native English speakers.

Hypothesis 4 is partially supported, with sustainers having specific attributes that pull them in and keep them more attached into self-employment than dabblers, however they are not more advantaged with respect to their skill levels and educational attainments, as they report low and intermediate level of skills and attainments. Sustainers are better off than dabblers, reporting better health conditions, less disabilities, higher work satisfaction, owning

their home outright and having lower probability to own by mortgage settlements, higher probability to be married/cohabiting with spouse/partner not needing to be employed and with higher percentage of previously self-employed fathers. On the other hand, the dabbled self-employed have higher percentage probability of previous self-employed mothers, employed spouse/partner, providing secure income for financial reassurance, report relatively the highest levels of educational attainments, and higher probability in working in highly skilled industries.

The findings of the first empirical chapter do not align well with our main hypotheses reasoning, where we expected to find a group of disadvantaged workers dabbling between the labour market states, reflecting a market deficiency because they cannot access paid employment nor endure long in self-employment, and are rather pushed into self-employment. What we actually found is that self-employed dabblers are not the marginalised group of workers that we expected them to be and their movement between forms of self-employed and employee jobs seems to reflect a labour market 'power' of sorts, where they have the ability to move between forms of employment depending on the returns they perceive and are pulled rather than pushed. There is a clear understanding that dabblers demonstrate a vibrant tendency towards self-employment and paid employment but are also distinct from both self-employed sustainers and the always employees. This implies that we have a sequential of highly professionals and advantaged portfolio workers possibly making the best out of self-employment and paid employment jobs as they arise. As for the sustained self-employed, we find them to have more aligned characteristics with self-employment but were unable to validate their entrepreneurial orientation, because they are not relatively more skilled than the dabbled self-employed.

6.2.2 Earnings Returns to Human Capital

In the second empirical chapter of this thesis (chapter 4), we estimate the earnings returns to education for our combined group of self-employed and paid workers and compare with the

computed returns for our self-employed sustainers, self-employed dabblers and the always employees. We follow the same division intake from the previous chapter, where sustainers are workers who we observe most of their employment time (more than 55 percent) in self-employment. The always paid employees are workers who are only committed to paid employment during their total observed employment time, and the dabbled self-employed are workers who dip-in and out of self-employment and paid employment and spend less time in self-employment than sustainers (less than 55 percent). We use the same combined panel datasets; the BHPS and the UKHLS, between the years 1991 till most recent release 2014 (with missing data for year 2009), and estimate the earnings returns to years of education, for the whole period, using the semi-log Mincerian earnings' regression, with the Ordinary Least Square model, Random Effect model and Fixed Effect model to interpret the result. Furthermore, we account for the endogeneity problem of education by using Instrumental Variable techniques (using father's education as instrument) and for the non-random selection into occupational choice via the Heckman selection model (including the gross labour income from other households' members and indication if respondents' fathers were previously self-employed, as additional control variables in the participation equation). The main objective of this chapter is to measure the respective earnings returns for our three groups of workers, and to check which group enjoys higher earnings returns.

We expect different returns to education for our division groups, because of the previously looked differences with respect to the observed characteristics, skills levels and educational attainments. We base our hypotheses on the extension of the personal control theory, similar to the approach of Fossen and Buttner (2013) on opportunity and necessity entrepreneurs, but relating to our group of self-employed sustainers, self-employed dabblers and paid workers. We argue in hypothesis 1 that self-employed sustainers should enjoy higher earnings returns than paid employees, because they have better control over own human

capital, as they are not bound by an organisation's rules or constraints. In hypothesis 2, self-employed sustainers have higher earnings returns than self-employed dabblers because they have more planning advantages and are well embedded in self-employment. And in hypothesis 3, self-employed dabblers have lower returns than paid workers, because of their agile way of work, and inability to secure and ensure for long in paid employment. Thus, their lower returns compared to the other two groups of workers is justified by their oscillating way of work.

Our empirical findings using our preferred estimation model [Fixed Effect model] only confirm with hypothesis 3, that the returns for additional years of education are significantly lower for the dabbled self-employed compared to the always employees (4.8 percentage point lower than the always employees, whose rates of returns are estimated at 15.3 percent using the IV methods). Opposite findings are shown when using credentials, as the coefficients for the educational qualifications dummy variables were higher and significant for all levels, but the earnings returns for their years of education were lower, though in both cases we find this subgroup of workers to report the highest number of years of education and highest levels of educational attainments in our sample. Thus, self-employed dabblers seem to suffer from some form of labour market disadvantage, when we consider their returns to education and account for the selectivity in occupational choice and the endogeneity problem of education. This might also be the result of their dip-in and dip-out behaviour that does not allow us to capture truly the value of their earnings returns.

Moving to our group of sustainers, we could not find any robust evidence for hypotheses 1 and 2, about the higher returns of sustainers than dabblers and paid workers; although our analysis points out towards these directions, we were unable to reject the null hypotheses of no differences, based on cluster robust inference.

Although our results do not show any differences with the returns of the sustained self-employed, when pooling dabblers with sustainers, the single estimate of the average earnings

returns to years of education for the self-employed in general are understated. This is shown when estimating the returns for the combined group of self-employed compared to wage earners (the results are lower, but insignificant). Thus, this gives misguided information for policy makers on the returns to education in self-employment, where ignorance of the reasons behind the lower returns can lead to wrong policy interventions regarding self-employment. Thus, at the very least, we have identified the earnings returns for new group of workers [the dabblers] who were not previously identified in studies and we have contributed to new microeconometric evidence on the heterogeneity of earnings returns to education for the self-employed in the UK labour market, where we offer a new comparable type of distinction in the labour market that can be looked through in other studies and established in other countries.

6.2.3 Transition of workers prior and after the economic downturn

In the third and last empirical chapter of this thesis (chapter 5), we study the transition behaviour of our group of workers prior to and after the economic downturn (2008). We first observe the transition pattern of our respondents from years 1991 till 2014 (missing year 2009) and compare how well our data fits with the ONS and LFS findings to help us explain the overall changes in self-employment that occurred during recent years, in the UK labour market. We then view the stock of measure of our established division, self-employed sustainers, self-employed dabblers and paid employees, throughout the observed timeline and question the extent which the crisis (2008) changed the transition behaviour of our workers. Did recession promote employees to 'dabble' or did some 'sustain' self-employment? Or did the dabblers simply increase the amount of time spent in self-employment after the recession? Next, we redefine our division criteria to look at the flow of workers in and out of self-employment during periods when the economy is booming when it is still affected by the economic downturn (2008) using approach 1. Approach 1 relies on identifying the same criteria for our division, but only between the years 1991 till 2003, and observing the flow of our workers in

and out self-employment between the years 2003 to 2007, prior to the economic downturn and when the labour market is booming (pre-crisis period), and between the years 2010 till 2014, following the economic downturn (post-crisis period). We choose to study the movement of workers between these two different periods of time (from 2003 to 2007 and from 2010 to 2014), for five consecutive years in a row to have more objective assessment on the transition behaviour of our workers. The drawback in our study is that we have missing values for the year 2009, for that reason we choose to exclude both years 2008 and 2009 during which the crisis occurred, as we are interested in examining the effect prior and after the economic downturn. Hence, we observe flow of a consistent group of workers during the years when the economy is buoyant and in periods where it is still affected by the economic downturn and analyse the changes in the socio-economic and demographic characteristics and earnings returns during these different periods.

Because the analysis here is exploratory and descriptive in nature, we do not test for any specific hypotheses, we mainly focus on the flow of dabbled self-employed because they have proven to be unique in their own form of work, their attributes and earnings returns, compared to self-employed sustainers and paid workers. The aim of this chapter is to gain a better insight on the growth in self-employment and the new forms of working in the UK labour market in recent years, and to capture the effect of the crisis on the transition behaviour of our group of workers.

Our findings reveal that our data follows the same pattern as the ONS and LFS findings, but our percentages are much smaller, because the compared studies have much wider coverage of the UK market, and follow different labour market classifications than our surveys. Although, our data follows the same pattern, it does not explicitly show the rise in self-employment after the economic downturn. The limitation here is that we are bounded in

observing the same number of respondents for certain years, whereas the rise might be attributed to new labour market entrants which our surveys are unable to depict.

The results from the stock of measure for our sustained self-employed and dabbled self-employed in self-employment throughout the whole period of study (from 1991 till 2014, missing year 2009) show that both types of worker behave differently in our study. Where the proportion of sustainers who we observe in self-employment decreases over time (during the early years 2000's and more after the crisis), due to their shift to paid employment and exit out of the labour market, whereas for dabblers we find a rise in their occurrence in self-employment, especially in the early years 2000s and more predominantly after the crisis.

The results from approach 1, between pre-crisis and post-crisis periods show the self-employed sustainers to not be well embedded in self-employment as we expect them to be. Their flow continues to decline in self-employment in both periods, reversed by their entry in paid employment and exit out of the labour market, while their unemployment levels are low at most times. Furthermore, analysis of characteristics and earnings returns show that they are on average older and report lower returns, especially after the crisis, even with the increase in their accumulated years of education. This implies that they might have exited self-employment because of retirement. Nevertheless, the lower returns, following the crisis would also suggest that these workers are getting lower pay and perhaps are being downgraded to less skilled wage jobs instead of entering unemployment, however we are unable to hold this argument as the estimates found are insignificant.

As for our self-employed dabblers, the outcomes reveal that this group behaves differently than sustainers and paid workers. Even though we witness a decline in their flow in self-employment in both periods, they persist much longer in this labour market state than the sustained self-employed. Still, they show greater propensity towards paid employment rather than self-employment, as the majority engage in wage jobs. But, we also notice their fall in

wage employment in both periods, and rise in their inactivity levels, while unemployment levels are low, when the economy is at its surge and high after the economic downturn. The analysis of characteristics shows the rise in their years of education over time implying that they have opted out of the labour market to advance their education and not because they were demotivated. Their higher earnings returns than the always employees and sustained self-employed, post-crisis period align with the mentioned above, but we could not support the claims as the results are insignificant. We might think at first that their rise in self-employment is just a temporary state to find secure wage employment, but their higher persistence after the economic downturn revealed that these workers intentionally chose to be self-employed, where they are the younger and more established version of sustainers in the labour market.

For the always employees we see much higher perseverance in paid employment than the two subgroups of self-employed. But for a very small fraction, we observe the rise in inflow in self-employment prior to the economic downturn, and more after the effect of the crisis. Analysis of characteristics and earnings returns show that these workers report lower returns when the economy is buoyant. This is conceivable as the period looked through is attended by the emergence of the gig economy that negatively affected traditional paid work. Following the crisis, we find higher reported earnings for wage earners, possibly exposing more stability in this type of work than self-employment. We also witness the entry of employees into self-employment and the rise of new dabbling forms, but we would attribute this effect to push and negative reasons linked to the onset of the crisis.

Overall, we provide key insights into a group [*Dabblers*] who have not been separately identified in the labour market to date, where we offer a better proximity on the behaviour of workers in the labour market prior to and after the economic downturn, and we raise awareness of policy makers on this dabbling form of work, with the most challenging factor looking at the issue of their security and longevity to help support effective labour government policies.

6.3 Final Remarks, Policy Implications and Future Research

Still, there are many unanswered questions on the nature of self-employment, in terms of industry and occupation levels, skills requirements, patterns, conditions of work, information on psychological factors and difficulties in measuring and comparing earnings with paid workers. We encourage future research to assess these issues and understand the changes within self-employment jobs and the wellbeing of workers. As well, we urge official statistics and policy makers to consider and capture this new pattern of work [the dabbling effect], beyond the simple distinction between self-employment and paid employment, and provide more information on the dynamic changes at industry and occupational levels over time. This will help support more effective research on policy implications and evaluations on education and self-employment in the labour market, and develop relevant regulations and effective policies for all workers, notwithstanding what form of work they engage in. Especially, this is critical for policy makers as it allows them to properly conceptualise the different categories within self-employment and construct tax policies that take into the consideration the individual economic contribution of each of the identified group of workers.

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Appendix A

Table 1A: Descriptive Statistics Division 2 (Individual Characteristics)

	Sustained self-employed (1,111 respondents)	Dabbled self-employed (1,184 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Individual Characteristics							
Gender				1.04			
Male	80.62%	68.98%	51.04%		0.000	0.000	0.000
Female	19.38%	31.02%	49.06%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Ethnicity				1.12			
White	96.75%	97.29%	97.81%		0.000	0.000	0.166
Non-White	3.25%	2.70%	2.09%		0.437	0.000	0.000
missing	0.00%	0.01%	0.11%		0.000	0.000	0.000
Country of Origin				1.01			
UK	93.66%	94.56%	95.83%		0.168	0.000	0.000
Non-UK	6.34%	5.44%	4.27%		0.168	0.000	0.000
missing	0.00%	0.00%	0.00%				
Language				1.36			
English	78.05%	90.05%	79.86%		0.000	0.842	0.000
Non-English	5.17%	2.55%	2.13%		0.000	0.000	0.000
missing	16.78%	7.40%	18.01%		0.000	0.000	0.000
Age				1.34			
16-24	2.89%	8.03%	10.76%		0.000	0.000	0.000
25-39	35.31%	47.55%	10.76%		0.000	0.000	0.002
40-49	32.21%	29.77%	45.09%		0.134	0.000	0.000
50-64	27.24%	14.16%	28.34%		0.000	0.000	0.019
65+	2.34%	0.49%	15.24%		0.000	0.000	0.000
missing	0.00%	0.00%	0.57%				
Health status				1.16			
Good	80.80%	79.91%	78.78%		0.000	0.000	0.000
Fair	15.32%	16.50%	16.66%		0.000	0.092	0.000
Poor	3.80%	3.50%	4.46%		0.000	0.682	0.000
missing	0.08%	0.09%	0.10%		0.000	0.000	0.000
Disable				1.08			
Yes	1.26%	1.37%	4.44%		0.000	0.001	0.000
No	98.72%	98.63%	95.65%		0.000	0.000	0.000
missing	0.02%	0.00%	0.01%		0.000	0.000	0.001
Educational Qualifications				5.25			
Higher degree	42.19%	52.50%	45.97%		0.000	0.084	0.000
A-levels	12.74%	12.89%	12.82%		0.000	0.820	0.000
GCSEs	20.48%	17.14%	21.51%		0.000	0.898	0.000
Other qualifications	9.21%	7.54%	7.73%		0.000	0.000	0.000
None	15.22%	9.35%	11.06%		0.210	0.000	0.000
missing	0.17%	0.59%	0.91%		0.000	0.000	0.000
Vocational Qualifications				1.67			
Yes	44.21%	43.93%	44.28%		0.000	0.393	0.000
No	55.41%	55.46%	54.73%		0.000	0.056	0.000
missing	0.38%	0.61%	0.99%		0.000	0.027	0.000

Source: BHPS & UKHLS

Table 1B: Descriptive Statistics Division 2 (Work Nature)

Variables	Sustained self-employed (1,111 respondents)	Dabbled self-employed (1,184 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Work Nature							
Industry Levels				1.31			
High skilled	42.78%	44.08%	32.99%		0.000	0.000	0.000
Medium skilled	32.87%	32.45%	36.49%		0.000	0.019	0.000
Low skilled	14.53%	18.47%	21.40%		0.000	0.000	0.000
missing	9.82%	5.00%	9.12%		0.000	0.000	0.000
Employ staff				20.10			
Yes	31.73%	4.28%	0.00%		0.000	0.000	0.000
No	58.10%	12.42%	0.00%		0.000	0.000	0.000
missing	10.17%	83.30%	100.00%		0.000	0.000	0.000
nature of self-employment				20.01			
Own business	31.89%	4.47%	0.00%		0.000	0.000	0.000
Partner in a business	12.33%	1.94%	0.00%		0.000	0.000	0.000
Work for self-employed	33.60%	7.41%	0.00%		0.000	0.000	0.000
Both own and work	1.70%	0.28%	0.00%		0.000	0.000	0.000
Subcontractor	5.38%	1.42%	0.00%		0.000	0.000	0.000
Freelancer	3.34%	0.68%	0.00%		0.000	0.000	0.000
Other	1.61%	0.51%	0.00%		0.001	0.000	0.000
missing	10.14%	83.28%	100.00%		0.000	0.000	0.000
Second paid job				6.69			
Yes	10.25%	13.33%	7.90%		0.000	0.000	0.000
No	89.62%	86.56%	92.04%		0.000	0.022	0.000
missing	0.14%	0.11%	0.06%		0.000	0.000	0.000
Work statisfaction							
dissatisifed	6.63%	10.12%	10.39%	1.75	0.000	0.000	0.000
neither	5.62%	7.51%	7.49%		0.000	0.000	0.000
satisfied	87.63%	82.27%	82.05%		0.000	0.000	0.000
missing	0.12%	0.10%	0.07%		0.000	0.840	0.000

Source: BHPS & UKHLS

Table 1C: Descriptive Statistics Division 2 (Household Characteristics)

Variables	Sustained self-employed (1,111 respondents) Percentages	Dabbled self-employed (1,184 respondents) Percentages	Always employees (9,362 respondents) Percentages	VIF	Pearson χ^2 test Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Household Characteristics							
Married /Cohabitting				1.73			
Yes	81.70%	80.07%	74.73%		0.000	0.000	0.000
No	18.14%	19.89%	24.72%		0.000	0.000	0.000
missing	0.17%	0.04%	0.55%		0.000	0.000	0.000
Spouse/Partner employed				1.72			
Yes	63.26%	66.25%	64.79%		0.000	0.000	0.000
No	18.36%	13.68%	10.27%		0.002	0.000	0.000
missing	18.38%	20.08%	24.94%		0.000	0.000	0.000
Has Children				1.22			
Yes	43.74%	47.91%	40.93%		0.000	0.000	0.000
No	56.26%	52.09%	59.17%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Responsible for dependent child under age of 16				1.09			
Yes	8.86%	15.73%	20.24%		0.000	0.232	0.000
No	91.14%	84.27%	79.76%		0.000	0.028	0.000
missing	0.00%	0.00%	0.00%		0.000	0.058	0.000
Care for other household members				1.84			
Yes	3.06%	2.47%	3.22%		0.000	0.000	0.000
No	86.11%	88.82%	87.71%		0.000	0.000	0.000
missing	10.84%	8.71%	9.07%		0.000	0.000	0.000
Housing tenure				1.35			
Own house outright	23.44%	10.76%	11.57%		0.000	0.000	0.000
Own house mortgage	62.10%	74.83%	69.62%		0.000	0.000	0.000
Rent	14.08%	14.19%	18.48%		0.000	0.000	0.000
missing	0.38%	0.21%	0.33%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 1D: Descriptive Statistics Division 2 (Parental Background)

Variables	Sustained self-employed (1,111 respondents)	Dabbled self-employed (1,184 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Parents background							
Father employment history				1.22			
Employee	59.67%	66.64%	69.90%		0.000	0.000	0.000
Self-employed	26.77%	18.32%	13.33%		0.000	0.000	0.000
missing	13.56%	15.04%	16.77%		0.476	0.000	0.000
Mother employment history				1.11			
Employee	39.51%	48.14%	50.10%		0.000	0.000	0.001
Self-employed	7.59%	6.35%	3.56%		0.000	0.000	0.000
missing	52.90%	45.51%	46.34%		0.000	0.000	0.000
Father educational qualifications				4.42			
University degree	32.75%	32.18%	30.77%		0.000	0.000	0.000
Further education	13.70%	16.42%	13.03%		0.000	0.003	0.000
School qualifications	18.59%	25.97%	19.34%		0.000	0.007	0.000
None	6.64%	6.10%	4.44%		0.000	0.000	0.000
missing	28.32%	19.33%	32.43%		0.000	0.000	0.000
Mother educational qualifications				4.49			
University degree	34.40%	38.26%	34.42%		0.000	0.000	0.000
Further education	21.44%	27.04%	21.36%		0.000	0.002	0.000
School qualifications	12.65%	15.12%	10.88%		0.000	0.000	0.000
None	3.09%	2.82%	3.04%		0.000	0.077	0.000
missing	28.43%	16.75%	30.30%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 2A: Descriptive Statistics Division 3 (Individual Characteristics)

	Sustained self-employed (1,303 respondents)	Dabbled self-employed (992 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Individual Characteristics							
Gender				1.04			
Male	79.89%	68.24%	51.04%		0.000	0.000	0.000
Female	20.11%	31.76%	49.06%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Ethnicity				1.12			
White	97.01%	97.14%	97.81%		0.000	0.000	0.388
Non-White	2.99%	2.85%	2.09%		0.257	0.000	0.000
missing	0.00%	0.01%	0.11%		0.000	0.000	0.000
Country of Origin				1.01			
UK	94.13%	94.30%	95.83%		0.454	0.000	0.000
Non-UK	5.87%	5.70%	4.27%		0.454	0.000	0.000
missing	0.00%	0.00%	0.00%				
Language				1.36			
English	78.55%	91.01%	79.86%		0.000	0.093	0.000
Non-English	4.84%	2.51%	2.13%		0.000	0.000	0.000
missing	16.61%	6.48%	18.01%		0.000	0.000	0.000
Age				1.34			
16-24	3.82%	7.88%	10.76%		0.000	0.000	0.000
25-39	36.62%	47.91%	10.76%		0.000	0.000	0.000
40-49	31.28%	30.22%	45.09%		0.960	0.000	0.000
50-64	26.03%	13.64%	28.34%		0.000	0.000	0.282
65+	2.25%	0.35%	15.24%		0.000	0.000	0.312
missing	0.00%	0.00%	0.57%				
Health status				1.16			
Good	80.68%	79.90%	78.78%		0.000	0.000	0.000
Fair	15.58%	16.43%	16.66%		0.000	0.024	0.000
Poor	3.67%	3.57%	4.46%		0.000	0.712	0.000
missing	0.07%	0.10%	0.10%		0.000	0.000	0.000
Disable				1.08			
Yes	1.22%	1.41%	4.44%		0.000	0.004	0.000
No	98.76%	98.59%	95.65%		0.000	0.001	0.000
missing	0.01%	0.00%	0.01%		0.000	0.000	0.000
Educational Qualifications				5.25			
Higher degree	43.20%	52.87%	45.97%		0.000	0.693	0.000
A-levels	13.71%	12.15%	12.82%		0.000	0.001	0.000
GCSEs	19.56%	17.47%	21.51%		0.000	0.162	0.000
Other qualifications	8.84%	7.64%	7.73%		0.000	0.007	0.000
None	14.54%	9.21%	11.06%		0.544	0.000	0.000
missing	0.14%	0.66%	0.91%		0.000	0.000	0.000
Vocational Qualifications				1.67			
Yes	44.07%	44.00%	44.28%		0.000	0.042	0.000
No	55.61%	55.32%	54.73%		0.000	0.003	0.000
missing	0.33%	0.68%	0.99%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 2B: Descriptive Statistics Division 3 (Work Nature)

Variables	Sustained self-employed (1,303 respondents)	Dabbled self-employed (992 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Work Nature							
Industry Levels				1.31			
High skilled	42.20%	44.68%	32.99%		0.000	0.000	0.000
Medium skilled	32.48%	32.70%	36.49%		0.000	0.015	0.000
Low skilled	15.63%	18.06%	21.40%		0.000	0.000	0.000
missing	9.69%	4.56%	9.12%		0.000	0.000	0.000
Employ staff				20.10			
Yes	29.14%	3.22%	0.00%		0.000	0.000	0.000
No	54.42%	10.15%	0.00%		0.000	0.000	0.000
missing	16.44%	86.63%	100.00%		0.000	0.000	0.000
nature of self-employment				20.01			
Own business	29.19%	3.50%	0.00%		0.000	0.000	0.000
Partner in a business	11.43%	1.47%	0.00%		0.000	0.000	0.000
Work for self-employed	31.63%	6.00%	0.00%		0.000	0.000	0.000
Both own and work	1.50%	0.28%	0.00%		0.000	0.000	0.000
Subcontractor	5.23%	1.10%	0.00%		0.000	0.000	0.000
Freelancer	3.04%	0.62%	0.00%		0.000	0.000	0.000
Other	1.57%	0.41%	0.00%		0.000	0.000	0.000
missing	16.40%	86.62%	100.00%		0.000	0.000	0.000
Second paid job				6.69			
Yes	11.08%	13.03%	7.90%		0.000	0.000	0.000
No	88.77%	86.87%	92.04%		0.000	0.605	0.000
missing	0.14%	0.10%	0.06%		0.000	0.000	0.000
Work statisfaction				1.75			
dissatisifed	7.17%	10.09%	10.39%		0.000	0.000	0.000
neither	5.68%	7.68%	7.49%		0.000	0.000	0.000
satisfied	87.01%	82.15%	82.05%		0.000	0.000	0.000
missing	0.14%	0.08%	0.07%		0.000	0.945	0.000

Source: BHPS & UKHLS

Table 2C: Descriptive Statistics Division 3 (Household Characteristics)

	Sustained self-employed (1,303 respondents)	Dabbled self-employed (992 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Household Characteristics							
Married /Cohabitting				1.73			
Yes	81.24%	80.24%	74.73%		0.000	0.000	0.000
No	18.61%	19.72%	24.72%		0.000	0.000	0.000
missing	0.14%	0.04%	0.55%		0.000	0.000	0.000
Spouse/Partner employed				1.72			
Yes	63.38%	66.48%	64.79%		0.000	0.000	0.000
No	17.75%	13.63%	10.27%		0.379	0.000	0.000
missing	18.86%	19.89%	24.94%		0.000	0.000	0.000
Has Children				1.22			
Yes	43.63%	48.47%	40.93%		0.000	0.000	0.000
No	56.37%	51.53%	59.17%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Responsible for dependent child under age of 16				1.09			
Yes	9.33%	16.14%	20.24%		0.000	0.530	0.000
No	90.67%	83.86%	79.76%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Care for other household members				1.84			
Yes	3.03%	2.42%	3.22%		0.000	0.000	0.000
No	86.38%	88.91%	87.71%		0.000	0.000	0.000
missing	10.59%	8.67%	9.07%		0.000	0.000	0.000
Housing tenure				1.35			
Own house outright	22.01%	10.46%	11.57%		0.000	0.000	0.000
Own house mortgage	63.54%	75.14%	69.62%		0.000	0.000	0.000
Rent	14.11%	14.18%	18.48%		0.000	0.000	0.000
missing	0.34%	0.22%	0.33%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 2D: Descriptive Statistics Division 3 (Parental Background)

	Sustained self-employed (1,303 respondents)	Dabbled self-employed (992 respondents)	Always employees (9,362 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Parents background							
Father employment history				1.22			
Employee	60.07%	67.11%	69.90%		0.000	0.000	0.000
Self-employed	26.08%	17.91%	13.33%		0.000	0.000	0.000
missing	13.85%	14.98%	16.77%		0.000	0.000	0.000
Mother employment history				1.11			
Employee	40.83%	48.08%	50.10%		0.000	0.000	0.000
Self-employed	7.15%	6.55%	3.56%		0.000	0.000	0.000
missing	52.02%	45.37%	46.34%		0.000	0.000	0.000
Father educational qualifications				4.42			
University degree	33.10%	31.84%	30.77%		0.000	0.000	0.000
Further education	13.72%	16.70%	13.03%		0.000	0.043	0.000
School qualifications	18.95%	26.51%	19.34%		0.000	0.000	0.000
None	6.98%	5.77%	4.44%		0.000	0.000	0.000
missing	27.24%	19.17%	32.43%		0.000	0.000	0.000
Mother educational qualifications				4.49			
University degree	35.00%	38.23%	34.42%		0.000	0.000	0.000
Further education	21.53%	27.59%	21.36%		0.000	0.003	0.000
School qualifications	13.44%	14.79%	10.88%		0.000	0.000	0.000
None	3.06%	2.82%	3.04%		0.000	0.002	0.000
missing	26.98%	16.57%	30.30%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 3A: Descriptive Statistics Division 4 (Individual Characteristics)

	Sustained self-employed (524 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	Always self-employed (622 respondents)	VIF	Pearson χ^2 test					
	Percentages	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Sust vs Always Self-employed P-val	Dabb vs Emp P-val.	Sust vs Always Self-employed P-val.	Emp vs Always Self-employed P-val.
Variables											
Individual Characteristics											
Gender					1.04						
Male	79.42%	68.45%	51.04%	82.79%		0.000	0.000	0.000	0.000	0.000	0.000
Female	20.58%	31.55%	49.06%	17.21%		0.000	0.000	0.000	0.000	0.000	0.000
missing	0.00%	0.00%	0.00%	0.00%							
Ethnicity					1.12						
White	96.06%	97.22%	97.81%	98.00%		0.000	0.000	0.000	0.461	0.001	0.001
Non-White	3.94%	2.77%	2.09%	2.00%		0.002	0.000	0.000	0.000	0.009	0.970
missing	0.00%	0.01%	0.11%	0.00%							
Country of Origin					1.01						
UK	92.72%	94.49%	95.83%	95.34%		0.004	0.004	0.001	0.001	0.369	0.001
Non-UK	7.28%	5.51%	4.27%	4.66%		0.004	0.004	0.001	0.001	0.369	0.001
missing	0.00%	0.00%	0.00%	0.00%							
Language					1.36						
English	84.34%	90.18%	79.86%	70.31%		0.000	0.000	0.000	0.000	0.000	0.000
Non-English	6.42%	2.38%	2.13%	3.72%		0.000	0.000	0.000	0.000	0.065	0.000
missing	9.24%	7.44%	18.01%	25.97%		0.003	0.003	0.000	0.000	0.000	0.000
Age					1.34						
16-24	3.69%	8.17%	10.76%	1.90%		0.000	0.000	0.000	0.000	0.000	0.000
25-39	39.46%	47.94%	10.76%	29.62%		0.000	0.000	0.000	0.000	0.000	0.000
40-49	32.57%	29.82%	45.09%	31.21%		0.025	0.000	0.005	0.000	0.181	0.119
50-64	22.10%	13.68%	28.34%	34.55%		0.000	0.000	0.000	0.467	0.000	0.000
65+	2.18%	0.38%	15.24%	2.72%							
missing	0.00%	0.00%	0.57%	0.00%							
Health status					1.16						
Good	79.96%	79.98%	78.78%	81.59%		0.000	0.000	0.000	0.000	0.000	0.000
Fair	15.95%	16.43%	16.66%	14.86%		0.028	0.000	0.000	0.000	0.000	0.000
Poor	4.04%	3.50%	4.46%	3.45%		0.602	0.000	0.000	0.000	0.000	0.000
missing	0.05%	0.09%	0.10%	0.10%		0.000	0.000	0.000	0.000	0.000	0.000
Disable					1.08						
Yes	1.29%	1.33%	4.44%	1.38%		0.117	0.000	0.000	0.000	0.000	0.000
No	98.71%	98.67%	95.65%	98.59%		0.117	0.000	0.000	0.000	0.000	0.000
missing	0.00%	0.00%	0.01%	0.03%							
Educational Qualifications					5.25						
Higher degree	45.73%	52.57%	45.97%	38.28%		0.000	0.000	0.000	0.000	0.000	0.000
A-levels	14.02%	12.54%	12.82%	12.24%		0.353	0.000	0.000	0.000	0.000	0.000
GCSEs	19.92%	17.55%	21.51%	19.31%		0.016	0.000	0.000	0.000	0.000	0.000
Other qualifications	7.18%	7.57%	7.73%	11.72%		0.000	0.000	0.000	0.000	0.360	0.446
None	13.13%	9.16%	11.06%	18.10%		0.000	0.000	0.000	0.000	0.000	
missing	0.02%	0.61%	0.91%	0.34%							
Vocational Qualifications					1.67						
Yes	44.93%	44.01%	44.28%	42.86%		0.000	0.000	0.000	0.000	0.000	0.000
No	54.92%	55.36%	54.73%	56.48%		0.000	0.000	0.000	0.000	0.000	0.000
missing	0.15%	0.63%	0.99%	0.66%		0.000	0.000	0.000	0.000	0.000	0.000

Source: BHPS & UKHLS

Table 3B: Descriptive Statistics Division 4 (Work Nature)

	Sustained self-employed (524 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	Always self-employed (622 respondents)	VIF	Pearson χ^2 test					
	Percentages	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Sust vs Always Self-employed P-val	Dabb vs Emp P-val.	Sust vs Always Self-employed P-val.	Emp vs Always Self-employed P-val.
Variables											
Work Nature											
Industry Levels					1.31						
High skilled	42.48%	44.30%	32.99%	0.66%		0.000	0.000	0.000	0.000	0.000	0.028
Medium skilled	33.66%	32.67%	36.49%	30.90%		0.114	0.000	0.000	0.000	0.000	0.000
Low skilled	16.77%	18.06%	21.40%	13.41%		0.000	0.003	0.003	0.003	0.003	0.003
missing	7.08%	4.97%	9.12%	13.14%		0.000	0.000	0.000	0.000	0.000	0.000
Employ staff					20.10						
Yes	26.26%	4.06%	0.00%	36.76%		0.000	0.000	0.000	0.000	0.000	0.000
No	53.01%	11.43%	0.00%	63.17%		0.000	0.000	0.000	0.000	0.000	0.000
missing	20.73%	84.51%	100.00%	0.07%		0.000	0.000	0.000	0.000	0.000	0.000
nature of self-employment					20.01						
Own business	25.09%	4.24%	0.00%	38.83%		0.000	0.000	0.000	0.000	0.000	0.000
Partner in a business	11.82%	1.74%	0.00%	12.52%		0.000	0.000	0.000	0.000	0.000	0.000
Work for self-employed	30.07%	6.78%	0.00%	37.55%		0.000	0.000	0.000	0.000	0.000	0.000
Both own and work	1.31%	0.29%	0.00%	2.03%		0.000	0.000	0.000	0.000	0.000	0.000
Subcontractor	5.85%	1.31%	0.00%	4.66%		0.000	0.000	0.000	0.000	0.387	0.000
Freelancer	3.37%	0.68%	0.00%	2.97%		0.000	0.000	0.000	0.000	0.036	0.000
Other	1.83%	0.45%	0.00%	1.38%		0.000	0.000	0.000	0.000	0.343	0.000
missing	20.66%	84.50%	100.00%	0.07%		0.000	0.000	0.000	0.000	0.000	0.000
Second paid job					6.69						
Yes	12.58%	13.01%	7.90%	8.55%		0.000	0.000	0.000	0.000	0.000	0.000
No	87.22%	86.87%	92.04%	91.41%		0.000	0.000	0.000	0.000	0.000	0.000
missing	0.20%	0.11%	0.06%	0.03%		0.000	0.000	0.000	0.000	0.000	0.000
Work statisfaction					1.75						
dissatisifed	7.01%	10.18%	10.39%	6.31%		0.000	0.060	0.000	0.000	0.000	0.000
neither	5.50%	7.65%	7.49%	5.55%		0.000	0.395	0.000	0.000	0.000	0.000
satisfied	87.32%	82.07%	82.05%	88.10%		0.000	0.000	0.000	0.000	0.000	0.000
missing	0.17%	0.10%	0.07%	0.03%		0.000	0.000	0.000	0.000	0.000	0.000

Source: BHPS & UKHLS

Table 3C: Descriptive Statistics Division 4 (Household Characteristics)

	Sustained self-employed (524 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	Always self-employed (622 respondents)	VIF	Pearson χ^2 test					
	Percentages	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Sust vs Always Self-employed P-val	Dabb vs Emp P-val.	Sust vs Always Self-employed P-val.	Emp vs Always Self-employed P-val.
Variables											
Household Characteristics											
Married /Cohabitting					1.73						
Yes	81.79%	79.98%	74.73%	81.69%		0.006	0.000	0.000	0.000	0.000	0.000
No	18.08%	19.98%	24.72%	18.10%		0.000	0.009	0.000	0.000	0.000	0.000
missing	0.12%	0.04%	0.55%	0.21%		0.000	0.000	0.000	0.000	0.000	0.000
Spouse/Partner employed					1.72						
Yes	65.52%	66.22%	64.79%	60.59%		0.000	0.000	0.000	0.000	0.000	0.000
No	16.13%	13.62%	10.27%	21.10%		0.000	0.000	0.000	0.000	0.000	0.000
missing	18.36%	20.16%	24.94%	18.31%		0.005	0.000	0.000	0.000	0.000	0.000
Has Children					1.22						
Yes	45.55%	51.85%	40.93%	40.86%		0.000	0.000	0.000	0.000	0.000	0.000
No	54.45%	51.85%	59.17%	59.14%		0.485	0.000	0.000	0.000	0.000	0.000
missing	0.00%	0.00%	0.00%	0.00%							
Responsible for dependent child under age of 16					1.09						
Yes	9.71%	15.93%	20.24%	7.79%		0.244	0.042	0.001	0.001	0.001	0.016
No	90.29%	84.07%	79.76%	92.21%		0.000	0.000	0.000	0.000	0.000	0.000
missing	0.00%	0.00%	0.00%	0.00%		0.000	0.000	0.000	0.000	0.000	0.000
Care for other household members					1.84						
Yes	2.50%	2.47%	3.22%	3.76%		0.000	0.000	0.000	0.000	0.000	0.000
No	86.70%	88.89%	87.71%	85.34%		0.335	0.000	0.000	0.000	0.000	0.000
missing	10.80%	8.64%	9.07%	10.90%		0.000	0.000	0.000	0.000	0.000	0.000
Housing tenure					1.35						
Own house outright	19.02%	10.60%	11.57%	28.62%		0.000	0.000	0.000	0.000	0.059	0.059
Own house mortgage	66.66%	74.90%	69.62%	57.07%		0.000	0.000	0.000	0.000	0.000	0.000
Rent	14.05%	14.28%	18.48%	13.83%		0.005	0.000	0.000	0.000	0.000	0.000
missing	0.27%	0.22%	0.33%	0.48%		0.000	0.000	0.000	0.000	0.000	0.000

Source: BHPS & UKHLS

Table 3D: Descriptive Statistics Division 4 (Parental Background)

	Sustained self-employed (524 respondents)	Dabbled self-employed (1,149 respondents)	Always employees (9,362 respondents)	Always self-employed (622 respondents)	VIF	Pearson χ^2 test					
	Percentages	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Sust vs Always Self-employed P-val	Dabb vs Emp P-val.	Sust vs Always Self-employed P-val.	Emp vs Always Self-employed P-val.
Variables											
Parents background											
Father employment history					1.22						
Employee	60.00%	66.74%	69.90%	59.69%		0.000	0.000	0.000	0.000	0.000	0.000
Self-employed	27.50%	18.10%	13.33%	25.55%		0.000	0.000	0.000	0.000	0.000	0.000
missing	12.51%	15.16%	16.77%	14.76%		0.000	0.000	0.000	0.000	0.000	0.000
Mother employment history					1.11						
Employee	43.40%	47.90%	50.10%	36.03%		0.000	0.000	0.000	0.000	0.000	0.000
Self-employed	7.95%	6.45%	3.56%	6.59%		0.000	0.000	0.000	0.000	0.027	0.027
missing	48.65%	45.65%	46.34%	57.38%		0.000	0.002	0.002	0.002	0.002	0.002
Father educational qualifications					4.42						
University degree	34.63%	31.60%	30.77%	32.21%		0.000	0.000	0.000	0.000	0.000	0.000
Further education	15.73%	16.27%	13.03%	11.76%		0.057	0.000	0.000	0.000	0.000	0.000
School qualifications	20.88%	26.30%	19.34%	15.10%		0.000	0.000	0.000	0.000	0.000	0.000
None	7.93%	6.07%	4.44%	4.90%		0.077	0.000	0.000	0.000	0.000	0.002
missing	20.83%	19.77%	32.43%	36.03%		0.003	0.000	0.000	0.000	0.000	
Mother educational qualifications					4.49						
University degree	35.65%	37.81%	34.42%	34.83%		0.843	0.000	0.000	0.000	0.000	0.018
Further education	24.89%	27.03%	21.36%	17.34%		0.000	0.000	0.000	0.000	0.000	0.000
School qualifications	15.16%	15.26%	10.88%	8.93%		0.681	0.000	0.000	0.000	0.000	0.000
None	3.39%	2.80%	3.04%	2.72%		0.654	0.000	0.000	0.000	0.000	0.001
missing	20.91%	17.10%	30.30%	36.17%		0.000	0.000	0.000	0.000	0.000	0.000

Source: BHPS & UKHLS

Table 4A: Descriptive Statistics Division 5 (Individual Characteristics)

	Sustained self-employed (1,570 respondents)	Dabbled self-employed (1,684 respondents)	Always employees (12,916 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Individual Characteristics							
Gender				1.09			
Male	77.66%	62.68%	46.15%		0.000	0.000	0.000
Female	22.34%	37.32%	53.85%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Ethnicity				1.08			
White	96.87%	96.90%	97.51%		0.000	0.000	0.060
Non-White	3.12%	3.10%	2.40%		0.018	0.004	0.000
missing	0.01%	0.01%	0.09%		0.000	0.000	0.000
Country of Origin				1.01			
UK	93.76%	94.15%	95.49%		0.008	0.000	0.000
Non-UK	6.24%	5.85%	4.51%		0.008	0.000	0.000
missing	0.01%	0.00%	0.00%				
Language				1.30			
English	81.83%	91.32%	83.25%		0.000	0.000	0.000
Non-English	4.80%	2.63%	2.65%		0.000	0.000	0.000
missing	13.37%	6.05%	14.10%		0.000	0.000	0.000
Age				1.63			
16-24	2.72%	8.20%	9.95%		0.000	0.000	0.000
25-39	30.98%	44.20%	39.98%		0.000	0.000	0.000
40-49	29.25%	28.58%	26.49%		0.000	0.000	0.000
50-64	32.94%	18.00%	22.22%		0.000	0.000	0.000
65+	4.12%	1.01%	1.36%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%		0.000	0.000	0.000
Health status				1.16			
Good	79.23%	79.01%	76.69%		0.000	0.000	0.000
Fair	16.50%	16.89%	18.11%		0.000	0.003	0.000
Poor	4.22%	4.02%	5.10%		0.053	0.008	0.000
missing	0.06%	0.08%	0.10%		0.000	0.000	0.000
Disable				1.13			
Yes	1.66%	1.59%	1.92%		0.055	0.000	0.000
No	98.33%	98.41%	98.07%		0.144	0.000	0.000
missing	0.01%	0.00%	0.01%		0.000	0.000	0.001
Educational Qualifications				4.38			
Higher degree	41.52%	52.15%	44.18%		0.000	0.299	0.000
A-levels	12.51%	12.26%	11.90%		0.000	0.336	0.000
GCSEs	19.88%	17.31%	20.84%		0.000	0.036	0.000
Other qualifications	8.98%	7.54%	8.16%		0.000	0.025	0.000
None	16.96%	9.93%	14.03%		0.000	0.000	0.000
missing	0.14%	0.81%	0.88%		0.000	0.000	0.000
Vocational Qualifications				1.61			
Yes	42.34%	43.47%	42.27%		0.000	0.000	0.000
No	57.37%	55.69%	56.76%		0.000	0.183	0.000
missing	0.29%	0.84%	0.97%		0.000	0.010	0.000

Source: BHPS & UKHLS

Table 4B: Descriptive Statistics Division 5 (Work Nature)

	Sustained self-employed (1,570 respondents)	Dabbled self-employed (1,684 respondents)	Always employees (12,916 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Work Nature							
Industry Levels				2.76			
High skilled	42.76%	42.20%	31.54%		0.000	0.000	0.000
Medium skilled	33.06%	34.13%	37.33%		0.000	0.000	0.000
Low skilled	15.17%	19.36%	23.12%		0.000	0.000	0.000
missing	9.02%	4.31%	8.01%		0.000	0.192	0.000
Employ staff				22.55			
Yes	28.76%	3.58%	0.00%		0.000	0.000	0.000
No	58.43%	11.73%	0.00%		0.000	0.000	0.000
missing	12.80%	84.68%	100.00%		0.000	0.000	0.000
nature of self-employment				22.45			
Own business	30.83%	3.90%	0.00%		0.000	0.000	0.000
Partner in a business	10.54%	1.58%	0.00%		0.000	0.000	0.000
Work for self-employed	34.34%	7.04%	0.00%		0.000	0.000	0.000
Both own and work	1.63%	0.25%	0.00%		0.000	0.000	0.000
Subcontractor	4.90%	1.21%	0.00%		0.000	0.000	0.000
Freelancer	3.47%	0.88%	0.00%		0.000	0.000	0.000
Other	1.52%	0.47%	0.00%		0.000	0.000	0.000
missing	12.77%	84.68%	100.00%		0.000	0.000	0.000
Second paid job				5.52			
Yes	10.18%	12.74%	7.62%		0.000	0.000	0.000
No	89.72%	87.14%	92.32%		0.000	0.824	0.000
missing	0.10%	0.11%	0.06%		0.000	0.000	0.000
Work statisfaction				3.16			
dissatisifed	7.27%	10.53%	10.36%		0.000	0.000	0.000
neither	5.63%	7.96%	7.40%		0.000	0.000	0.000
satisfied	86.91%	81.37%	82.16%		0.000	0.013	0.000
missing	0.19%	0.14%	0.08%		0.000	0.000	0.000
Total waves in unemployment and/or inactivity				1.66			
0	59.86%	43.53%	49.99%		0.000	0.000	0.000
1	10.51%	17.21%	13.76%		0.000	0.000	0.000
2	6.20%	11.20%	7.39%		0.000	0.000	0.000
3-8	13.70%	22.10%	18.85%		0.000	0.000	0.000
8+	9.74%	5.97%	10.02%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 4C: Descriptive Statistics Division 5 (Household Characteristics)

Variables	Sustained self-employed (1,570 respondents)	Dabbled self-employed (1,684 respondents)	Always employees (12,916 respondents)	VIF	Pearson χ^2 test		
	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Household Characteristics							
Married /Cohabitting				1.68			
Yes	82.43%	78.86%	75.04%		0.000	0.000	0.000
No	17.45%	21.10%	24.92%		0.000	0.000	0.000
missing	0.12%	0.03%	0.04%		0.000	0.000	0.000
Spouse/Partner employed				1.82			
Yes	62.48%	64.69%	62.86%		0.000	0.000	0.000
No	19.85%	13.97%	11.97%		0.000	0.000	0.000
missing	17.67%	21.34%	25.16%		0.000	0.000	0.000
Has Children				1.28			
Yes	38.89%	45.21%	38.00%		0.000	0.128	0.000
No	61.11%	54.79%	62.00%		0.000	0.000	0.000
missing	0.00%	0.00%	0.00%				
Responsible for dependent child under age of 16				1.07			
Yes	9.25%	18.08%	21.27%		0.102	0.245	0.311
No	90.75%	81.92%	78.73%		0.000	0.019	0.000
missing	0.00%	0.00%	0.00%		0.000	0.007	0.000
Care for other household members				1.77			
Yes	3.61%	2.67%	3.78%		0.000	0.000	0.000
No	85.88%	88.17%	86.75%		0.000	0.000	0.000
missing	10.51%	9.16%	9.47%		0.000	0.000	0.000
Housing tenure				1.29			
Own house outright	26.19%	13.36%	14.98%		0.000	0.000	0.000
Own house mortgage	59.19%	70.21%	64.77%		0.000	0.000	0.000
Rent	14.27%	16.17%	19.93%		0.000	0.000	0.000
missing	0.34%	0.26%	0.32%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 4D: Descriptive Statistics Division 5 (Parental Background)

	Sustained self-employed (1,570 respondents)	Dabbled self-employed (1,684 respondents)	Always employees (12,916 respondents)	VIF	Pearson χ^2 test		
Variables	Percentages	Percentages	Percentages		Sust vs Dabb P-val.	Sust vs Emp P-val.	Dabb vs Emp P-val.
Parents background							
Father employment history				1.30			
Employee	61.36%	67.19%	70.36%		0.000	0.000	0.000
Self-employed	25.56%	18.47%	12.61%		0.000	0.000	0.000
missing	13.08%	14.34%	17.03%		0.000	0.000	0.000
Mother employment history				1.12			
Employee	39.91%	47.57%	47.81%		0.000	0.000	0.000
Self-employed	7.04%	5.86%	3.53%		0.000	0.000	0.000
missing	53.05%	46.57%	48.66%		0.000	0.000	0.000
Father educational qualifications				3.53			
University degree	36.82%	34.66%	34.82%		0.000	0.000	0.000
Further education	13.85%	15.74%	13.07%		0.000	0.781	0.000
School qualifications	18.30%	24.93%	20.26%		0.000	0.036	0.000
None	5.94%	6.70%	4.52%		0.000	0.003	0.000
missing	25.09%	17.96%	27.32%		0.000	0.000	0.000
Mother educational qualifications				3.55			
University degree	25.09%	40.39%	39.63%		0.006	0.000	0.000
Further education	20.08%	26.18%	20.42%		0.000	0.000	0.000
School qualifications	12.09%	14.70%	11.63%		0.000	0.598	0.000
None	2.90%	3.68%	2.81%		0.000	0.000	0.000
missing	24.39%	15.05%	25.50%		0.000	0.000	0.000

Source: BHPS & UKHLS

Table 5: Diagnostic Tests

Wald Test Significance for independent variables Division 1

Variables	Chi2	df	p>chi2
Male	2486.218	2	0
Non-White	14.751	2	0.001
UK Born	50.888	2	0
English language	239.941	2	0
Age 16-24	469.472	2	0
Age 25-39	226.805	2	0
Age 60-64	124.42	2	0
Age 65+	226.936	2	0
Health status good	4.867	2	0.088
Health status Poor	4.352	2	0.113
Disabled	11.442	2	0.003
Higher degree	159.126	2	0
A-levels	13.052	2	0.001
GCSEs	16.227	2	0
Other qualifications	4.856	2	0.088
No Vocational Qualifications	2.265	2	0.322
Industry High skilled	209.507	2	0
Industry Low skilled	229.64	2	0
Second paid job	591.434	2	0
Job Satisfaction satisified	3.69	2	0.158
Job Satisfaction neither	133.611	2	0
Married/cohabitting	3.167	2	0.205
Spouse/partner employed	928.438	2	0
Has children	19.989	2	0
Children under age of 16	19.565	2	0
Care for others	80.009	2	0
House owned outright	242.292	2	0
House owned with mortgage	73.527	2	0
Father self-employed	929.173	2	0
Mother self-employed	194.234	2	0

Wald tests for combining alternative Division 1

Alternatives	Chi2	df	p>chi2
Sustained and Dabbled self-employed	3576.037	46	0
Sustained self-employed and Always employees	8763.851	46	0
Dabbled self-employed and Always employees	4939.956	46	0

IIA tests for Division 1

Hausman Test

Alternatives	Chi2	df	p>chi2
Sustained self-employed	2.017	1	0.999
Dabbled self-employed	61.017	47	0.082
Always employees	19.804	5	0.067

Small Hsaio test

Alternatives	lnL(full)	lnL(omit)	Chi2	df	p>chi2
Sustained self-employed	-2.06E+04	-2.06E+04	53.686	47	0.233
Dabbled self-employed	-1.42E+04	-1.41E+04	61.064	47	0.082
Always employees	-8211.017	-8169.67	82.69	46	0.061

Predicted Probabilities for Division 1

Variables	Observations	Mean	Std.Dev	Min	Max
Predicted Probabilities for sustained self-employed	266448	0.16383	0.168352	0.000948	0.96849
Predicted Probabilities for dabbled self-employed	266448	0.142557	0.065384	8.63E-08	0.625577
Predicted Probabilities for always employees	266448	0.693614	0.181782	0.030638	0.986457
sustained self-employed	248479	0.099626	0.299502	0	1
dabbled self-employed	248479	0.100254	0.300339	0	1
always employees	248479	0.80012	0.399911	0	1

Source: BHPS & UKHLS

Table 6: Logit Model Marginal Effect Estimates

	Self-employed (2,601 respondents)			Paid employees (15,285 respondents)		
Variables	Marginal effect	Standard Errors	P-Values	Marginal effect	Standard Errors	P-Values
Individual Characteristics						
Male *(reference to female)*	0.094	0.002	0.000	-0.094	0.002	0.000
Non-white *(reference to White)*	-0.011	0.005	0.030	0.011	0.005	0.030
UK born *(reference to non-UK born)*	-0.018	0.004	0.000	0.018	0.004	0.000
English language *(reference to non-English)*	-0.033	0.005	0.000	0.033	0.005	0.000
Age groups *(reference to 40-49)*						
16-24	-0.079	0.003	0.000	0.079	0.003	0.000
25-39	-0.027	0.002	0.000	0.027	0.002	0.000
60-64	0.024	0.003	0.000	-0.024	0.003	0.000
65+	0.056	0.007	0.000	-0.056	0.007	0.000
Healthstatus *(reference to fair)*						
Good	0.004	0.002	0.084	-0.004	0.002	0.084
Poor	-0.001	0.004	0.735	0.001	0.004	0.735
Disable *(reference to not disabled)*	-0.001	0.003	0.674	0.001	0.003	0.674
Highest Educational Qualifications *(reference to none)*						
Higher degree	-0.030	0.003	0.000	0.030	0.003	0.000
A-levels	-0.008	0.004	0.037	0.008	0.004	0.037
GCSEs	-0.002	0.003	0.614	0.002	0.003	0.614
Other qualifications	0.003	0.004	0.434	-0.003	0.004	0.434
Vocational qualifications *(reference to none)*	0.003	0.002	0.129	-0.003	0.002	0.129
Work Nature						
Industry levels *(reference to medium skilled)*						
High skilled	0.023	0.002	0.000	-0.023	0.002	0.000
Low skilled	-0.036	0.002	0.000	0.036	0.002	0.000
Second paid jobs *(reference to none)*	0.029	0.003	0.000	-0.029	0.003	0.000
Job satisfaction *(reference to Not satisfied)*						
Satisified	0.035	0.002	0.002	-0.011	0.003	0.002
Neither	0.011	0.003	0.000	-0.035	0.002	0.000
Total unemployment and Inactivity spells *(reference to 2 spells)*						
0	0.002	0.003	0.464	-0.002	0.003	0.464
1	-0.006	0.004	0.074	0.006	0.004	0.074
3-8	-0.019	0.003	0.000	0.019	0.003	0.000
8+	-0.018	0.004	0.000	0.018	0.004	0.000
Household Characteristics						
Married/ Cohabitting *(reference to not married nor cohabitting)*	-0.022	0.019	0.243	0.022	0.019	0.243
Spouse/Partner employed *(reference to not working)*	-0.119	0.005	0.000	0.119	0.005	0.000
Has children *(reference to no children)*	0.005	0.002	0.041	-0.005	0.002	0.041
Responsible for dependent child under age of 16 *(reference to no*	0.033	0.004	0.000	-0.033	0.004	0.000
Care for other household members *(reference to not)*	-0.028	0.003	0.000	0.028	0.003	0.000
Housetenure *(reference to rent)*						
Owned outright	0.042	0.003	0.000	-0.042	0.003	0.000
Owned with mortgage	0.011	0.002	0.000	-0.011	0.002	0.000
Parents background						
Father self-employed *(reference to employee)*	0.059	0.003	0.000	-0.059	0.003	0.000
Mother self-employed *(reference to employee)*	0.038	0.004	0.000	-0.038	0.004	0.000
Number of Observation= 149,632						
LR chi2(50) = 12744.94						
Prob > chi2 = 0.0000						
Pseudo R2 = 0.2233						
Log likelihood = -45298.262						

Source BHPS & UKHLS

Table 7: Multinomial Logit Model Marginal Effect Estimates for Division 2

	Sustained self-employed (1,111 respondents)			Dabbled self-employed (1,184 respondents)			Always employees (9,362 respondents)		
Variables	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values
Individual Characteristics									
Male *(reference to female)*	0.086	0.002	0.000	0.079	0.003	0.000	-0.165	0.003	0.000
Non-white *(reference to White)*	-0.001	0.006	0.806	-0.018	0.009	0.047	0.020	0.008	0.016
UK born *(reference to non-UK born)*	-0.006	0.004	0.168	0.044	0.007	0.000	-0.038	0.006	0.000
English language *(reference to non-English)*	-0.069	0.007	0.000	0.043	0.006	0.000	0.026	0.008	0.002
Age groups *(reference to 40-49)*									
16-24	-0.075	0.003	0.000	-0.015	0.005	0.001	0.091	0.005	0.000
25-39	-0.032	0.002	0.000	0.005	0.003	0.079	0.027	0.003	0.000
60-64	0.032	0.003	0.000	-0.005	0.003	0.116	-0.026	0.004	0.000
65+	0.104	0.010	0.000	-0.013	0.009	0.179	-0.092	0.012	0.000
Healthstatus *(reference to fair)*									
Good	0.006	0.002	0.010	0.000	0.003	0.941	-0.006	0.004	0.098
Poor	0.001	0.004	0.856	-0.011	0.005	0.035	0.011	0.006	0.089
Disable *(reference to not disabled)*	-0.009	0.004	0.015	-0.010	0.005	0.036	0.019	0.005	0.001
Highest Educational Qualifications *(reference to none)*									
Higher degree	-0.042	0.004	0.000	0.034	0.005	0.000	0.009	0.005	0.059
A-levels	-0.019	0.004	0.000	0.011	0.006	0.073	0.009	0.005	0.099
GCSEs	-0.007	0.004	0.071	0.021	0.006	0.000	-0.014	0.005	0.004
Other qualifications	-0.005	0.005	0.324	-0.002	0.007	0.716	0.007	0.006	0.205
Vocational qualifications *(reference to none)*	0.002	0.002	0.460	-0.003	0.003	0.240	0.001	0.003	0.642
Work Nature									
Industry levels *(reference to medium skilled)*									
High skilled	0.019	0.002	0.000	0.030	0.003	0.000	-0.049	0.003	0.000
Low skilled	-0.035	0.002	0.000	-0.006	0.003	0.057	0.041	0.004	0.000
Second paid jobs *(reference to none)*	0.023	0.003	0.000	0.087	0.004	0.000	-0.110	0.005	0.000
Job satisfaction *(reference to Not satisfied)*									
Satisified	0.008	0.004	0.040	0.002	0.005	0.769	-0.009	0.006	0.121
Neither	0.033	0.003	0.000	0.005	0.004	0.200	-0.037	0.004	0.000
Household Characteristics									
Married/ Cohabitting *(reference to not married nor cohabitting)*	-0.008	0.020	0.693	-0.044	0.030	0.137	0.052	0.031	0.092
Spouse/Partner employed *(reference to not working)*	-0.071	0.004	0.000	-0.044	0.004	0.000	0.115	0.005	0.000
Has children *(reference to no children)*	0.010	0.002	0.000	0.005	0.003	0.085	-0.015	0.004	0.000
Responsible for dependent child under age of 16 *(reference to not)*	0.012	0.004	0.005	0.013	0.005	0.008	-0.024	0.005	0.000
Care for other household members *(reference to not)*	-0.031	0.004	0.000	-0.026	0.006	0.000	0.057	0.006	0.000
Housetenure *(reference to rent)*									
Owned outright	0.049	0.003	0.000	0.012	0.004	0.002	-0.061	0.005	0.000
Owned with mortgage	0.004	0.002	0.118	0.026	0.003	0.000	-0.030	0.004	0.000
Parents background									
Father self-employed *(reference to employee)*	0.066	0.003	0.000	0.025	0.003	0.000	-0.092	0.004	0.000
Mother self-employed *(reference to employee)*	0.040	0.005	0.000	0.049	0.006	0.000	-0.089	0.007	0.000

Number of Observation = 107,360
LR chi2(92) = 14652.49
Prob > chi2 = 0.0000
Pseudo R2 = 0.1927
Log likelihood = -71746.609

Source BHPS & UKHLS

Table 8: Multinomial Logit Model Marginal Effect Estimates for Division 3

	Sustained self-employed (1,303 respondents)			Dabbled self-employed (992 respondents)			Always employees (9,362 respondents)		
Variables	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values
Individual Characteristics									
Male *(reference to female)*	0.097	0.002	0.000	0.068	0.003	0.000	-0.164	0.003	0.000
Non-white *(reference to White)*	-0.008	0.006	0.178	-0.020	0.009	0.029	0.029	0.008	0.000
UK born *(reference to non-UK born)*	-0.002	0.005	0.712	0.046	0.007	0.000	-0.044	0.006	0.000
English language *(reference to non-English)*	-0.079	0.007	0.000	0.050	0.006	0.000	0.029	0.008	0.001
Age groups *(reference to 40-49)*									
16-24	-0.078	0.003	0.000	-0.011	0.005	0.016	0.090	0.005	0.000
25-39	-0.032	0.002	0.000	0.005	0.003	0.047	0.027	0.003	0.000
60-64	0.034	0.003	0.000	-0.008	0.003	0.021	-0.026	0.004	0.000
65+	0.120	0.010	0.000	-0.029	0.008	0.000	-0.091	0.012	0.000
Healthstatus *(reference to fair)*									
Good	0.006	0.003	0.016	0.000	0.003	0.927	-0.006	0.004	0.096
Poor	0.000	0.005	0.915	-0.010	0.005	0.047	0.011	0.006	0.086
Disable *(reference to not disabled)*	-0.008	0.004	0.036	-0.011	0.004	0.018	0.019	0.005	0.001
Highest Educational Qualifications *(reference to none)*									
Higher degree	-0.041	0.004	0.000	0.034	0.005	0.000	0.007	0.004	0.113
A-levels	-0.010	0.005	0.031	0.010	0.006	0.086	0.000	0.005	0.960
GCSEs	-0.010	0.004	0.018	0.021	0.006	0.000	-0.011	0.005	0.013
Other qualifications	-0.009	0.005	0.086	-0.002	0.007	0.746	0.011	0.006	0.047
Vocational qualifications *(reference to none)*	0.001	0.002	0.683	-0.002	0.002	0.349	0.001	0.003	0.660
Work Nature									
Industry levels *(reference to medium skilled)*									
High skilled	0.020	0.003	0.000	0.029	0.003	0.000	-0.049	0.003	0.000
Low skilled	-0.035	0.002	0.000	-0.007	0.003	0.027	0.042	0.004	0.000
Second paid jobs *(reference to none)*	0.036	0.004	0.000	0.074	0.004	0.000	-0.110	0.005	0.000
Job satisfaction *(reference to Not satisfied)*									
Satisified	0.005	0.004	0.203	0.004	0.005	0.423	-0.009	0.006	0.124
Neither	0.034	0.003	0.000	0.003	0.003	0.398	-0.037	0.004	0.000
Household Characteristics									
Married/ Cohabitting *(reference to not married nor cohabitting)*	-0.015	0.023	0.502	-0.036	0.028	0.200	0.051	0.031	0.096
Spouse/Partner employed *(reference to not working)*	-0.081	0.005	0.000	-0.034	0.004	0.000	0.115	0.005	0.000
Has children *(reference to no children)*	0.008	0.003	0.001	0.007	0.003	0.020	-0.015	0.004	0.000
Responsible for dependent child under age of 16 *(reference to not)*	0.013	0.004	0.002	0.010	0.004	0.020	-0.024	0.005	0.000
Care for other household members *(reference to not)*	-0.033	0.004	0.000	-0.026	0.006	0.000	0.058	0.006	0.000
Housetenure *(reference to rent)*									
Owned outright	0.055	0.004	0.000	0.006	0.004	0.122	-0.061	0.005	0.000
Owned with mortgage	0.010	0.003	0.000	0.020	0.003	0.000	-0.030	0.004	0.000
Parents background									
Father self-employed *(reference to employee)*	0.076	0.003	0.000	0.016	0.003	0.000	-0.092	0.004	0.000
Mother self-employed *(reference to employee)*	0.037	0.005	0.000	0.053	0.006	0.000	-0.090	0.007	0.000

Number of Observation = 107,360
LR chi2(92) = 14633.71
Prob > chi2 = 0.0000
Pseudo R2 = 0.198
Log likelihood = -72411.021

Source BHPS & UKHLS

Table 9: Multinomial Logit Model Marginal Effect Estimates for Division 4

	Sustained self-employed (524 respondents)			Dabbled self-employed (1,149 respondents)			Always employees (9,362 respondents)			Always self-employed (622 respondents)		
Variables	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values	Marginal effect	Standard Errors	P-values
Individual Characteristics												
Male *(reference to female)*	0.047	0.002	0.000	0.075	0.003	0.000	-0.164	0.003	0.000	0.043	0.001	0.000
Non-white *(reference to White)*	0.001	0.005	0.765	-0.019	0.009	0.041	0.030	0.008	0.000	-0.012	0.003	0.000
UK born *(reference to non-UK born)*	-0.016	0.004	0.000	0.046	0.007	0.000	-0.039	0.006	0.000	0.009	0.003	0.001
English language *(reference to non-English)*	-0.053	0.006	0.000	0.054	0.006	0.000	0.025	0.008	0.003	-0.025	0.004	0.000
Age groups *(reference to 40-49)*												
16-24	-0.043	0.002	0.000	-0.012	0.005	0.010	0.090	0.005	0.000	-0.034	0.002	0.000
25-39	-0.017	0.002	0.000	0.006	0.003	0.026	0.027	0.003	0.000	-0.016	0.001	0.000
60-64	0.010	0.003	0.000	-0.009	0.003	0.005	-0.026	0.004	0.000	0.025	0.002	0.000
65+	0.064	0.008	0.000	-0.033	0.009	0.000	-0.089	0.012	0.000	0.058	0.007	0.000
Healthstatus *(reference to fair)*												
Good	0.000	0.002	0.852	0.001	0.003	0.803	-0.006	0.004	0.100	0.005	0.002	0.002
Poor	0.001	0.004	0.879	-0.011	0.005	0.035	0.010	0.006	0.098	0.000	0.003	0.903
Disable *(reference to not disabled)*	0.001	0.003	0.840	-0.011	0.005	0.021	0.019	0.005	0.001	-0.009	0.002	0.000
Highest Educational Qualifications *(reference to none)*												
Higher degree	-0.019	0.003	0.000	0.032	0.005	0.000	0.010	0.005	0.028	-0.023	0.002	0.000
A-levels	-0.004	0.004	0.316	0.009	0.006	0.152	0.005	0.005	0.283	-0.010	0.003	0.000
GCSEs	-0.002	0.004	0.557	0.020	0.006	0.000	-0.008	0.005	0.069	-0.009	0.003	0.001
Other qualifications	-0.011	0.004	0.008	-0.004	0.007	0.577	0.010	0.006	0.070	0.004	0.003	0.197
Vocational qualifications *(reference to none)*	0.002	0.002	0.284	-0.003	0.003	0.194	0.002	0.003	0.608	0.000	0.002	0.879
Work Nature												
Industry levels *(reference to medium skilled)*												
High skilled	0.008	0.002	0.000	0.031	0.003	0.000	-0.049	0.003	0.000	0.009	0.002	0.000
Low skilled	-0.018	0.002	0.000	-0.006	0.003	0.037	0.041	0.004	0.000	-0.017	0.001	0.000
Second paid jobs *(reference to none)*	0.029	0.003	0.000	0.080	0.004	0.000	-0.109	0.005	0.000	0.001	0.002	0.729
Job satisfaction *(reference to Not satisfied)*												
Satisified	0.003	0.003	0.283	0.003	0.005	0.620	-0.009	0.006	0.113	0.004	0.003	0.160
Neither	0.021	0.002	0.000	0.003	0.004	0.455	-0.038	0.004	0.000	0.014	0.002	0.000
Household Characteristics												
Married/ Cohabitting *(reference to not married nor cohabitting)*	0.001	0.017	0.972	-0.046	0.030	0.119	0.049	0.031	0.113	-0.003	0.013	0.784
Spouse/Partner employed *(reference to not working)*	-0.044	0.004	0.000	-0.040	0.004	0.000	0.114	0.005	0.000	-0.030	0.003	0.000
Has children *(reference to no children)*	0.005	0.002	0.023	0.007	0.003	0.026	-0.016	0.004	0.000	0.004	0.002	0.006
Responsible for dependent child under age of 16 *(reference to not)*	0.000	0.003	0.923	0.011	0.005	0.014	-0.023	0.006	0.000	0.011	0.003	0.001
Care for other household members *(reference to not)*	-0.023	0.003	0.000	-0.026	0.006	0.000	0.058	0.006	0.000	-0.009	0.002	0.000
Housetenure *(reference to rent)*												
Owned outright	0.024	0.003	0.000	0.011	0.004	0.005	-0.060	0.005	0.000	0.025	0.002	0.000
Owned with mortgage	0.006	0.002	0.004	0.023	0.003	0.000	-0.030	0.004	0.000	0.001	0.002	0.639
Parents background												
Father self-employed *(reference to employee)*	0.049	0.002	0.000	0.019	0.003	0.000	-0.092	0.004	0.000	0.024	0.002	0.000
Mother self-employed *(reference to employee)*	0.023	0.004	0.000	0.054	0.006	0.000	-0.089	0.007	0.000	0.013	0.003	0.000

Number of Observation = 107,360
LR chi2(138) = 16123.90
Prob > chi2 = 0.0000
Pseudo R2 = 0.1931
Log likelihood = -78577.226

Source BHPS & UKHLS

Table 10: Multinomial Logit Model Marginal Effect Estimates for Division 5

	Sustained self-employed (1,570 respondents)			Dabbled self-employed (1,684 respondents)			Always employees (12,916 respondents)		
Variables	Marginal effect	Standard Errors	P-Values	Marginal effect	Standard Errors	P-Values	Marginal effect	tandard Error	P-Values
Individual Characteristics									
Male *(reference to female)*	0.082	0.002	0.000	0.069	0.002	0.000	-0.151	0.002	0.000
Non-white *(reference to White)*	-0.008	0.004	0.051	-0.007	0.006	0.234	0.015	0.005	0.004
UK born *(reference to non-UK born)*	-0.013	0.003	0.000	0.045	0.005	0.000	-0.032	0.004	0.000
English language *(reference to non-English)*	-0.046	0.005	0.000	0.039	0.004	0.000	0.007	0.006	0.251
Age groups *(reference to 40-49)*									
16-24	-0.068	0.002	0.000	-0.026	0.003	0.000	0.093	0.004	0.000
25-39	-0.031	0.002	0.000	0.002	0.002	0.367	0.029	0.003	0.000
60-64	0.031	0.002	0.000	-0.023	0.003	0.000	-0.008	0.003	0.016
65+	0.049	0.004	0.000	-0.068	0.003	0.000	0.018	0.005	0.000
Healthstatus *(reference to fair)*									
Good	0.001	0.002	0.493	0.007	0.002	0.001	-0.008	0.002	0.001
Poor	0.002	0.003	0.548	-0.003	0.003	0.422	0.001	0.004	0.792
Disable *(reference to not disabled)*	0.002	0.002	0.333	-0.009	0.003	0.004	0.006	0.004	0.076
Highest Educational Qualifications *(reference to none)*									
Higher degree	-0.020	0.002	0.000	-0.012	0.003	0.000	0.033	0.003	0.000
A-levels	0.003	0.003	0.222	-0.029	0.004	0.000	0.026	0.003	0.000
GCSEs	0.004	0.003	0.140	-0.015	0.004	0.000	0.011	0.003	0.000
Other qualifications	0.003	0.003	0.297	-0.027	0.004	0.000	0.024	0.004	0.000
Vocational qualifications *(reference to none)*	-0.003	0.002	0.112	-0.002	0.002	0.370	0.004	0.002	0.061
Work Nature									
Industry levels *(reference to medium skilled)*									
High skilled	0.019	0.002	0.000	0.019	0.002	0.000	-0.038	0.003	0.000
Low skilled	-0.033	0.002	0.000	-0.009	0.003	0.000	0.043	0.003	0.000
Second paid jobs *(reference to none)*	0.033	0.003	0.000	0.076	0.003	0.000	-0.109	0.004	0.000
Job satisfaction *(reference to Not satisfied)*									
Satisified	0.003	0.003	0.309	0.005	0.004	0.219	-0.008	0.005	0.092
Neither	0.026	0.002	0.000	0.001	0.003	0.845	-0.027	0.003	0.000
Total unemployment and Inactivity spells *(reference to 2 spells)*									
0	0.020	0.003	0.000	-0.075	0.003	0.000	0.055	0.004	0.000
1	0.000	0.003	0.969	-0.025	0.004	0.000	0.025	0.005	0.000
3-8	-0.016	0.003	0.000	-0.023	0.004	0.000	0.039	0.004	0.000
8+	-0.013	0.003	0.000	-0.075	0.004	0.000	0.088	0.004	0.000
Household Characteristics									
Married/ Cohabitting *(reference to not married nor cohabitting)*	0.005	0.012	0.672	0.012	0.015	0.415	-0.017	0.018	0.332
Spouse/Partner employed *(reference to not working)*	-0.038	0.002	0.000	-0.017	0.003	0.000	0.055	0.003	0.000
Has children *(reference to no children)*	0.015	0.002	0.000	0.019	0.003	0.000	-0.034	0.003	0.000
Responsible for dependent child under age of 16 *(reference to not)*	0.008	0.003	0.011	0.002	0.003	0.463	-0.010	0.004	0.013
Care for other household members *(reference to not)*	-0.013	0.003	0.000	-0.030	0.004	0.000	0.042	0.004	0.000
Housetenure *(reference to rent)*									
Owned outright	0.032	0.002	0.000	0.008	0.003	0.002	-0.040	0.003	0.000
Owned with mortgage	0.007	0.002	0.000	0.021	0.002	0.000	-0.028	0.003	0.000
Parents background									
Father self-employed *(reference to employee)*	0.067	0.002	0.000	0.030	0.002	0.000	-0.097	0.003	0.000
Mother self-employed *(reference to employee)*	0.038	0.004	0.000	0.034	0.004	0.000	-0.072	0.005	0.000

Number of Observation= 196890
LR chi2(100) = 23371.24
Prob > chi2 = 0.0000
Pseudo R2 = 0.1837
Log pseudolielihood= -127988.52

Source BHPS & UKHLS

Table 11: Multinomial Logit Model Marginal Effect Cross-section Estimates for Division 1

	Sustained self-employed (1,570 respondents)			Dabbled self-employed (1,684 respondents)			Always employees (12,916 respondents)		
Variables	Marginal effect	Standard Errors	P-Values	Marginal effect	Standard Errors	P-Values	Marginal effect	Standard Errors	P-Values
Individual Characteristics									
Male *(reference to female)*	0.090	0.005	0.000	0.054	0.005	0.000	-0.145	0.007	0.000
Non-white *(reference to White)*	-0.010	0.016	0.510	-0.008	0.023	0.721	0.019	0.019	0.326
UK born *(reference to non-UK born)*	-0.010	0.011	0.396	-0.017	0.017	0.296	0.027	0.014	0.056
English language *(reference to non-English)*	-0.093	0.023	0.000	0.036	0.018	0.049	0.058	0.027	0.030
Age	0.004	0.000	0.000	0.000	0.000	0.472	-0.004	0.000	0.000
Parents background									
Father self-employed *(reference to employee)*	0.094	0.009	0.000	0.019	0.008	0.017	-0.113	0.011	0.000
Mother self-employed *(reference to employee)*	0.048	0.014	0.001	0.038	0.015	0.009	-0.087	0.019	0.000
Number of Observation= 12946									
LR chi2(22) = 1519.20									
Prob > chi2 = 0.0000									
Pseudo R2 = 0.0917									
Log pseudolielihood= -7525.5831									

Source BHPS & UKHLS

Appendix B

Table 1: Two Sample Wilcoxon rank-sum (Mann-Whitney) test

Self-employed versus Employees	Observation	Rank sum	Expected
Self-employed	12546	7.38E+08	8.49E+08
Employees	1.20E+05	8.41E+09	8.30E+09
Combined	1.40E+05	9.15E+09	9.15E+09
Unadjusted variance	1.74E+13		
adjustment for ties	-13210127		
adjusted variance	1.74E+13		

Ho: hourpay (self-employed) = hourpay (employee)
z = -26.433
prob > |z| = 0.000

Sustainers versus Dabblers	Observation	Rank sum	Expected
Sustainers	8132	7.78E+07	8.76E+07
Dabblers	1.34E+04	1.54E+08	1.44E+08
Combined	2.15E+04	2.32E+08	2.32E+08
Unadjusted variance	1.96E+11		
adjustment for ties	-1093747.4		
adjusted variance	1.96E+11		

Ho: hourpay (sustainers) = hourpay (dabblers)
z = -22.070
prob > |z| = 0.000

Sustainers versus Always employees	Observation	Rank sum	Expected
Sustainers	8132	2.76E+08	3.20E+08
Always employees	7.07E+04	2.83E+09	2.78E+09
Combined	7.88E+04	3.11E+09	3.11E+09
Unadjusted variance	3.77E+12		
adjustment for ties	-1977983		
adjusted variance	3.77E+12		

Ho: hourpay (sustainers) = hourpay (always employees)
z = -22.969
prob > |z| = 0.000

Dabblers versus Always employees	Observation	Rank sum	Expected
Dabblers	13409	5.85E+08	5.64E+08
Always employees	7.07E+04	2.95E+09	2.97E+09
Combined	8.41E+04	3.54E+09	3.54E+09
Unadjusted variance	6.64E+12		
adjustment for ties	-3110129.9		
adjusted variance	6.64E+12		

Ho: hourpay (dabblers) = hourpay (always employees)
z = 8.379
prob > |z| = 0.000

Table 2: Breusch and Pagan Lagrangian multiplier test for random effects

Test for the homogenous group of self-employed and paid employees
Test: Var(u) = 0
Chibar2(01) = 86590.13
Prob > chibar2 = 0.0000
Test for the sustained self-employed, dabbled self-employed and always employees
Test: Var(u) = 0
Chibar2(01) = 67017.80
Prob > chibar2 = 0.0000

Source: BHPS & UKHLS

Table 3: Hausman Test for Random Effect versus Fixed Effect

Test for the homogenous group of self-employed and paid employees
Test: Ho: difference in coefficients not systematic
chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 1293.80
Prob>chi2 = 0.0000
Test for the sustained self-employed, dabbled self-employed and always employees
Test: Ho: difference in coefficients not systematic
chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 2946.45
Prob>chi2 = 0.0000

Source: BHPS & UKHLS

Table 4: Durbin-Wu- Hausman test for endogeneity

Test for the homogenous group of self-employed and paid employees
Test: Ho: variables are exogenous
Robust regression F(2,8606) = 56.3965 (p = 0.0000)

Test for the sustained self-employed, dabbled self-employed and always employees
Test: Ho: variables are exogenous
Robust regression F(3,5009) = 27.0 915 (p = 0.0000)

Source: BHPS & UKHLS

Table 5: Tests for weak instruments

Test for the general group of self-employed and paid employees	
Wald Test	
Wald chi2(18) = 3499.48	
Prob > chi2 = 0.0000	
Stock-Yogo weak ID test critical values:	
10% maximal IV size	16.87
15% maximal IV size	9.93
20% maximal IV size	7.54
25% maximal IV size	6.28

Test for the sustained self-employed, dabbled self-employed and always employees	
Wald Test	
Wald chi2(19) = 2078.02	
Prob > chi2 = 0.0000	
Stock-Yogo weak ID test critical values:	
10% maximal IV size	N/A
15% maximal IV size	N/A
20% maximal IV size	N/A
25% maximal IV size	N/A

Source: BHPS & UKHLS

Table 6: Correlation Tables

For the general group of self-employed and paid employees

	Years of education	Years of education * self-employed dummy	Father has educational degree	Father has educational degree* self-employed dummy
Years of education	1			
Years of education * self-employed dummy	0.0843*	1		
Father has educational degree	0.2202*	0.0102*	1	
Father has educational degree* self-employed dummy	0.0739*	0.7252*	0.2202*	1

For the sustained self-employed, dabbled self-employed and always employees

	Years of education	Years of education * sustained self-employed dummy	Years of education * dabbled self-employed dummy	Father has educational degree	Father has educational degree* sustained self-employed dummy	Father has educational degree* dabbled self-employed dummy
Years of education	1					
Years of education * sustained self-employed dummy	0.0758*	1				
Years of education * dabbled self-employed dummy	0.1305 *	-0.1388 *	1			
Father has educational degree	0.1949*	0.0026*	0.0609 *	1		
Father has educational degree* sustained self-employed dummy	0.0591*	0.7311*	-0.1011*	0.2092*	1	
Father has educational degree* dabbled self-employed dummy	0.0695*	-0.1069 *	0.7529 *	0.3015*	-0.0778 *	1

Source: BHPS & UKHLS

Table 7a: IV First-stage regression Two-Stage-Least-Square for Self-employed and Paid workers

First Stage Regressions (1)

Dependent variable (Years of education)

	coefficients	standard errors	p-values
Self-employed	-0.169	0.122	0.168
Age	0.191	0.015	0.000
Age squarred	-0.002	0.000	0.000
Female	0.121	0.076	0.111
Married/Cohabitting	-0.210	0.089	0.018
Partner employed	0.140	0.068	0.041
Full time job	0.373	0.063	0.000
Has second paid job	0.144	0.076	0.058
Has children	0.156	0.078	0.046
Responsible for dependent child under 16	0.046	0.098	0.639
considered disable	1.025	0.069	0.000
Non-UK native	1.153	0.188	0.000
English first language	-0.293	0.101	0.004
Non-white	0.531	0.257	0.039
total numbers of waves in unemployment and inactivit	-0.077	0.008	0.000
λ	0.400	0.026	0.000
Father educated	1.090	0.069	0.000
Father educated *self-employed dummy	0.416	0.184	0.024
Constant	8.353	0.282	0.000

F(18, 79437) = 102.47
Prob > F = 0.0000
R-squared = 0.1119
Adj R-squared = 0.1117
person-year observations 79,456

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

Table 7b: IV First-stage regression Two-Stage-Least-Square for Self-employed and Paid workers

First Stage Regressions (2)

Dependent variable (Years of education* self-employed)

	coefficients	standard errors	p-values
Self-employed	12.003	0.116	0.000
Age	0.013	0.007	0.074
Age squarred	0.000	0.000	0.131
Female	0.039	0.018	0.029
Married/Cohabitting	-0.040	0.030	0.186
Partner employed	-0.016	0.026	0.541
Full time job	-0.061	0.019	0.002
Has second paid job	0.085	0.027	0.002
Has children	0.051	0.027	0.059
Responsible for dependent child under 16	-0.073	0.030	0.014
considered disable	0.078	0.020	0.000
Non-UK native	0.107	0.054	0.047
English first language	-0.003	0.036	0.928
Non-white	0.180	0.089	0.043
total numbers of waves in unemployment and inactivity	-0.008	0.002	0.000
λ	0.049	0.010	0.000
Father educated	-0.003	0.005	0.452
Father educated *self-employed dummy	1.629	0.178	0.000
Constant	-0.192	0.118	0.103

F(18, 79437) = 1358.19
Prob > F = 0.0000
R-squared = 0.9509
Adj R-squared = 0.9509
person-year observations 79,456

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

Table 8a: IV First-stage regression Two-Stage-Least-Square for Sustained Self-employed, Dabbled self-employed and Always employees

First Stage Regressions (1)

Dependent variable (Years of education)

	coefficients	standard errors	p-values
Sustained self-employed	-0.091	0.192	0.636
Dabbled self-employed	0.311	0.189	0.100
Age	0.211	0.025	0.000
Age squarred	-0.003	0.000	0.000
Female	0.053	0.098	0.589
Married/Cohabitting	-0.201	0.117	0.087
Partner employed	0.096	0.091	0.293
Full time job	0.403	0.091	0.000
Has second paid job	0.169	0.093	0.070
Has children	0.126	0.092	0.169
Responsible for dependent child under 16	0.074	0.122	0.542
considered disable	1.340	0.079	0.000
Non-UK native	1.237	0.244	0.000
English first language	-0.301	0.112	0.007
Non-white	0.842	0.357	0.019
λ	0.425	0.032	0.000
Father educated	1.082	0.096	0.000
Father educated * sustained self-employed dummy	0.301	0.274	0.273
Father educated * dabbled self-employed dummy	-0.213	0.238	0.372
Constant	8.076	0.443	0.000

F(19, 53916) = 102.47
Prob > F = 0.0000
R-squared = 0.0880
Adj R-squared = 0.0877
person-year observations 53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

Table 8b: IV First-stage regression Two-Stage-Least-Square for Sustained Self-employed, Dabbled self-employed and Always employees

First Stage Regressions (2)

Dependent variable (Years of education* sustainers)

	coefficients	standard errors	p-values
Sustained self-employed	12.315	0.175	0.000
Dabbled self-employed	0.001	0.007	0.930
Age	0.006	0.013	0.636
Age squarred	0.000	0.000	0.723
Female	0.033	0.025	0.191
Married/Cohabitting	-0.047	0.044	0.285
Partner employed	-0.014	0.036	0.695
Full time job	-0.041	0.030	0.165
Has second paid job	0.087	0.038	0.021
Has children	0.038	0.034	0.257
Responsible for dependent child under 16	-0.045	0.038	0.244
considered disable	0.076	0.022	0.001
Non-UK native	0.192	0.086	0.026
English first language	-0.020	0.046	0.662
Non-white	0.175	0.150	0.244
λ	0.053	0.012	0.000
Father educated	0.003	0.007	0.667
Father educated * sustained self-employed dummy	1.413	0.260	0.000
Father educated * dabbled self-employed dummy	-0.010	0.007	0.174
Constant	-0.085	0.209	0.686

F(19, 53916) = 593.23
Prob > F = 0.0000
R-squared = 0.9517
Adj R-squared = 0.9517
person-year observations 53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

Table 8c: IV First-stage regression Two-Stage-Least-Square for Sustained Self-employed, Dabbled self-employed and Always employees

First Stage Regressions (3)

Dependent variable (Years of education* dabblers)

	coefficients	standard errors	p-values
Sustained self-employed	-0.018	0.019	0.356
Dabbled self-employed	12.734	0.177	0.000
Age	0.052	0.008	0.000
Age squarred	-0.001	0.000	0.000
Female	0.007	0.041	0.855
Married/Cohabitting	0.002	0.049	0.960
Partner employed	-0.025	0.041	0.543
Full time job	0.022	0.034	0.516
Has second paid job	0.020	0.047	0.678
Has children	0.007	0.040	0.863
Responsible for dependent child under 16	-0.066	0.051	0.194
considered disable	0.123	0.034	0.000
Non-UK native	0.224	0.127	0.078
English first language	-0.056	0.043	0.195
Non-white	0.311	0.201	0.122
λ	0.064	0.013	0.000
Father educated	0.025	0.008	0.003
Father educated * sustained self-employed dummy	-0.018	0.016	0.249
Father educated * dabbled self-employed dummy	0.900	0.222	0.000
Constant	-1.062	0.159	0.000

F(19, 53916) = 871.30
Prob > F = 0.0000
R-squared = 0.9496
Adj R-squared = 0.9496
person-year observations 53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

Table 9: Main Earnings Regression for Division 2

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.065***	0.153***	-0.010*	0.065***
	(0.003)	(0.015)	(0.005)	(0.003)
educ * sustainers	-0.006	0.007	0.017	-0.009
	(0.010)	(0.042)	(0.027)	(0.010)
educ * dabblers	-0.000	0.049	-0.043**	-0.017**
	(0.006)	(0.047)	(0.015)	(0.006)
sustained self-employed	-0.229	-0.401	0.000	-0.349**
	(0.131)	(0.547)	(.)	(0.130)
dabbled self-employed	-0.037	-0.705	0.000	0.179*
	(0.074)	(0.624)	(.)	(0.086)
Age	0.060***	0.040***	0.109***	0.091***
	(0.004)	(0.006)	(0.003)	(0.003)
Age squarred	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.149***	-0.155***	0.000	-0.178***
	(0.014)	(0.017)	(.)	(0.015)
Married/Cohabitting	0.004	0.022	0.046***	0.018
	(0.018)	(0.022)	(0.013)	(0.013)
Partner employed	0.018	0.009	-0.006	0.002
	(0.015)	(0.017)	(0.009)	(0.010)
Full time job	0.076***	0.043*	-0.139***	-0.094***
	(0.015)	(0.019)	(0.013)	(0.012)
Has second paid job	-0.051***	-0.071***	-0.006	-0.022*
	(0.015)	(0.018)	(0.009)	(0.009)
Has children	0.070***	0.061***	0.031**	0.039***
	(0.014)	(0.017)	(0.010)	(0.010)
Responsible for dependent child under 16	-0.074***	-0.078***	-0.097***	-0.099***
	(0.019)	(0.023)	(0.014)	(0.014)
considered disable	0.112***	-0.020	-0.009	-0.030**
	(0.014)	(0.024)	(0.011)	(0.010)
Non-UK native	-0.081*	-0.224***	-0.153***	-0.091*
	(0.037)	(0.051)	(0.015)	(0.037)
English first language	0.017	0.035	-0.002	-0.044*
	(0.017)	(0.021)	(0.080)	(0.019)
Non-white	0.037	-0.045	0.000	0.036
	(0.057)	(0.074)	(.)	(0.038)
λ	0.092***	0.046***	-0.003	0.018**
	(0.008)	(0.010)	(0.006)	(0.006)
Constant	-0.163*	-0.913***	-0.689***	-0.952***
	(0.072)	(0.177)	(0.124)	(0.064)
R^2 (overall model)	0.214	0.003	0.307	0.147
educ			56.1034	
1st stage F statistic			0.037	
Shea`s Partial R^2				
educ * sustainers			10.4384	
1st stage F statistic			0.057	
Shea`s Partial R^2				
educ * dabblers			10.89738	
1st stage F statistic			0.027	
Shea`s Partial R^2				
person-year observations	53,936	53,936	53,936	53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the *selection correction term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 10: Main Earnings Regression for Division 3

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.065***	0.153***	-0.010*	0.065***
	(0.003)	(0.015)	(0.005)	(0.003)
educ * sustainers	-0.004	0.012	0.005	-0.010
	(0.010)	(0.040)	(0.026)	(0.009)
educ * dabblers	-0.002	0.046	-0.041**	-0.018**
	(0.006)	(0.050)	(0.014)	(0.006)
sustained self-employed	-0.235	-0.457	0.000	-0.295*
	(0.122)	(0.525)	(.)	(0.122)
dabbled self-employed	0.003	-0.653	0.000	0.217*
	(0.076)	(0.665)	(.)	(0.088)
Age	0.059***	0.040***	0.108***	0.091***
	(0.004)	(0.006)	(0.003)	(0.003)
Age squarred	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.150***	-0.156***	0.000	-0.179***
	(0.014)	(0.017)	(.)	(0.015)
Married/Cohabitting	0.004	0.022	0.047***	0.018
	(0.018)	(0.022)	(0.013)	(0.013)
Partner employed	0.019	0.009	-0.007	0.002
	(0.015)	(0.017)	(0.009)	(0.010)
Full time job	0.077***	0.043*	-0.139***	-0.094***
	(0.015)	(0.019)	(0.013)	(0.012)
Has second paid job	-0.049***	-0.070***	-0.006	-0.021*
	(0.015)	(0.018)	(0.009)	(0.009)
Has children	0.070***	0.060***	0.031**	0.039***
	(0.014)	(0.017)	(0.010)	(0.010)
Responsible for dependent child under 16	-0.073***	-0.076***	-0.097***	-0.099***
	(0.019)	(0.023)	(0.014)	(0.014)
considered disable	0.111***	-0.020	-0.009	-0.029**
	(0.014)	(0.024)	(0.011)	(0.010)
Non-UK native	-0.083*	-0.224***	-0.153***	-0.093*
	(0.037)	(0.050)	(0.015)	(0.037)
English first language	0.017	0.033	-0.003	-0.042*
	(0.017)	(0.021)	(0.080)	(0.019)
Non-white	0.034	-0.049	0.000	0.037
	(0.056)	(0.075)	(.)	(0.038)
λ	0.092***	0.046***	-0.003	0.018**
	(0.008)	(0.010)	(0.006)	(0.006)
Constant	-0.158*	-0.911***	-0.685***	-0.950***
	(0.072)	(0.176)	(0.124)	(0.064)
R^2 (overall model)	0.215	0.006	0.306	0.148
educ				
1st stage F statistic			56.3915	
Shea`s Partial R^2			0.037	
educ * sustainers			12.1795	
1st stage F statistic			0.054	
Shea`s Partial R^2				
educ * dabblers				
1st stage F statistic			10.03067	
Shea`s Partial R^2			0.025	
person-year observations	53,936	53,936	53,936	53,936

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection *correction term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 11: Main Earnings Regression for Division 4

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.065***	0.153***	-0.010*	0.065***
	(0.003)	(0.015)	(0.005)	(0.003)
educ * sustainers	-0.002	0.050	0.028	-0.008
	(0.011)	(0.072)	(0.034)	(0.012)
educ * dabblers	-0.002	0.050	-0.048***	-0.020**
	(0.006)	(0.049)	(0.014)	(0.006)
educ * always self-employed	-0.010	-0.040	0.024	-0.011
	(0.019)	(0.048)	(0.039)	(0.017)
sustained self-employed	-0.251	-0.956	0.000	-0.297
	(0.148)	(0.958)	(.)	(0.159)
dabbled self-employed	-0.007	-0.721	0.000	0.231**
	(0.074)	(0.647)	(.)	(0.086)
always self-employed	-0.206	0.184	0.000	-0.419*
	(0.232)	(0.604)	(.)	(0.207)
Age	0.059***	0.039***	0.109***	0.091***
	(0.004)	(0.006)	(0.003)	(0.003)
Age squarred	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.151***	-0.156***	0.000	-0.181***
	(0.014)	(0.017)	(.)	(0.015)
Married/Cohabitting	0.004	0.022	0.046***	0.018
	(0.018)	(0.023)	(0.013)	(0.013)
Partner employed	0.018	0.009	-0.006	0.002
	(0.015)	(0.017)	(0.009)	(0.010)
Full time job	0.077***	0.044*	-0.139***	-0.094***
	(0.015)	(0.019)	(0.013)	(0.012)
Has second paid job	-0.049***	-0.067***	-0.005	-0.022*
	(0.015)	(0.018)	(0.009)	(0.009)
Has children	0.070***	0.062***	0.031**	0.039***
	(0.014)	(0.017)	(0.010)	(0.010)
Responsible for dependent child under 16	-0.072***	-0.078***	-0.097***	-0.099***
	(0.019)	(0.023)	(0.014)	(0.014)
considered disable	0.111***	-0.024	-0.009	-0.029**
	(0.014)	(0.025)	(0.011)	(0.010)
Non-UK native	-0.082*	-0.222***	-0.153***	-0.093*
	(0.037)	(0.050)	(0.015)	(0.037)
English first language	0.016	0.038	-0.002	-0.048*
	(0.017)	(0.022)	(0.080)	(0.019)
Non-white	0.034	-0.049	0.000	0.033
	(0.057)	(0.077)	(.)	(0.038)
λ	0.092***	0.045***	-0.003	0.018**
	(0.008)	(0.010)	(0.006)	(0.006)
Constant	-0.161*	-0.901***	-0.695***	-0.949***
	(0.071)	(0.177)	(0.123)	(0.064)
	53936.000	53936.000	53936.000	53936.000
R^2 (overall model)	0.215	0.088	0.307	0.148
educ				
1st stage F statistic		42.5766		
Shea`s Partial R^2		0.037		
educ * sustainers		7.06523		
1st stage F statistic		0.031		
Shea`s Partial R^2				
educ * dabblers				
1st stage F statistic		10.3512		
Shea`s Partial R^2		0.026		
educ * always self-employed				
1st stage F statistic		6.84881		
Shea`s Partial R^2		0.111		
person-year observations				

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is *the selection correction term.*

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level

Table 12: Main Earnings Regression for Division 5

Specifications	(S1)	(S2)	(S3)	(S4)
estimation methods	OLS	IV	FE	RE
educ	0.023***	0.151***	-0.004**	0.023***
	(0.001)	(0.011)	(0.002)	(0.001)
educ * sustainers	0.045***	0.006	0.000	0.041***
	(0.009)	(0.030)	(0.026)	(0.008)
educ * dabblers	0.019***	0.036	-0.051***	0.002
	(0.005)	(0.032)	(0.012)	(0.005)
sustained self-employed	0.000	0.000	0.000	-0.318**
	(.)	(.)	(.)	(0.104)
dabbled self-employed	0.146	-0.325	0.000	0.266***
	(0.079)	(0.382)	(.)	(0.072)
Age	0.043***	0.000	0.100***	0.079***
	(0.003)	(.)	(0.003)	(0.002)
Age squarred	-0.000***	0.032***	-0.001***	-0.001***
	(0.000)	(0.004)	(0.000)	(0.000)
Female	-0.163***	-0.000***	0.000	-0.156***
	(0.011)	(0.000)	(.)	(0.012)
Married/Cohabitting	0.026	-0.191***	0.049***	0.023*
	(0.014)	(0.013)	(0.011)	(0.010)
Partner employed	0.016	0.037*	-0.006	0.002
	(0.011)	(0.017)	(0.007)	(0.008)
Full time job	0.072***	0.015	-0.121***	-0.087***
	(0.011)	(0.013)	(0.009)	(0.009)
Has second paid job	-0.062***	0.062***	-0.026***	-0.043***
	(0.012)	(0.013)	(0.008)	(0.008)
Has children	0.052***	-0.069***	0.033***	0.037***
	(0.012)	(0.014)	(0.009)	(0.009)
Responsible for dependent child under 16	-0.048**	0.048***	-0.110***	-0.091***
	(0.015)	(0.015)	(0.012)	(0.012)
considered disable	0.099***	-0.052**	-0.003	-0.016
	(0.012)	(0.018)	(0.010)	(0.008)
Non-UK native	-0.066*	0.012	-0.144***	-0.108***
	(0.028)	(0.017)	(0.012)	(0.028)
English first language	0.034*	-0.183***	0.000	-0.026
	(0.016)	(0.037)	(.)	(0.017)
Non-white	0.029	0.030	0.018	0.070*
	(0.040)	(0.018)	(0.036)	(0.032)
total numbers of waves in unemployment and inactivity	-0.022***	-0.041	0.000	-0.041***
	(0.001)	(0.051)	(.)	(0.001)
λ	0.096***	0.070***	0.001	0.027***
	(0.006)	(0.008)	(0.005)	(0.005)
Constant	-0.241	-0.723***	-0.641***	-0.753***
	(0.160)	(0.122)	(0.108)	(0.050)
R^2 (overall model)	0.233	0.064	0.281	0.163
educ				
1st stage F statistic		99.1956		
Shea`s Partial R^2		0.042		
educ * sustainers				
1st stage F statistic		19.5649		
Shea`s Partial R^2		0.073		
educ * dabblers				
1st stage F statistic		14.6053		
Shea`s Partial R^2		0.036		
person-year observations	79,353	79,353	79,353	79,353

Source: BHPS & UKHLS

Notes: Standard errors are robust to heteroscedasticity and clustered at the individual level . Instrumental estimation (S2) with endogenous variable Educ and its interration with self-employed ; excluded instruments : father's education and its interraction with sustained and dabbled self-employed. F-statistics at the bottom of the table refer to first stage test of joint significance of excluded instruments and λ is the selection correction term.

* Significance of the coefficient at 10% level
** Significance of the coefficient at 5% level
*** Significance of the coefficient at 1% level