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## **Economy and Divorces:**

### **Their Impact over Time on the Self-Employment Rates in Spain**

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## Abstract

*The paper used time-series data and examined the effect of economic and social variables on the male and female self-employment rates in Spain. We also employed cointegration analysis (with and without) structural breaks. We thus find strong evidence that long run relationships exist among the variables. More precisely, we find that the unemployment rates and the ratio of self-employment to employees' earnings have a positive effect on self-employment, whereas, economic development and divorce rates have a negative effect. Importantly, we find that the economic variables have equal or stronger long run impact on females than males, with both groups reacting to changes in family circumstances. Finally, we show that the short run family circumstances are better predictors of self-employment choices rather than economic factors, with self-employment being a means of adjustment to new personal circumstances and economic needs.*

**Keywords:** Self-employment, Economy, Divorce, Gender, Spain, Cointegration

**JEL Classification:** J1, J12, J18, J23, J24, L26, O1

## Introduction

The Spanish economy is in a prolonged state of economic crisis. For instance, today the Spanish unemployment rate at 19.6% is among the highest in the European area, which has an average unemployment rate of 8.6% (Eurostat 2017). Even more, the unemployment levels among the youths are as high as 44.4% when compared to only 18.7% in the European area (Eurostat 2017). In times of high unemployment rates, the citizens' purchasing powers are systematically lowered and consequentially, businesses cut back on production, investment, and employment levels. Additionally, prolonged periods of unemployment result in some citizens migrating to other countries. Thus, there is a reduction in the country's human capital (see Bartolini et al. 2016; Giousmpasoglou and Koniordos 2017), which further negatively compromises the prospects for short and long run economic growth. Hence, the social and macroeconomic future is even more dismal. Nevertheless, self-employment within recent times is shown to be important as a means of surviving and coming out of the economic crisis. Self-employment can be viewed as an escape from unemployment (see González Menéndez and Cueto 2015) and a way to stem the outflows of human capital, stimulate the economy, create new jobs, promote innovation and thus bring the country back to economic prosperity (see Baumol and Strom 2007; Casson and Wadeson 2007; Congregado et al. 2010; Cowling et al. 2004; Wong et al. 2005 ).

However, the prolonged state of an economic crisis also has negative social effects. For instance, over the last decade, Spain has experienced significant social changes with marital dissolutions being a notable example. In particular, there was a sharp increase in divorce rates, especially after the introduction of the 2005 Express Divorce Law and the negative macroeconomic upheavals which followed the financial crisis. González and Viitanen (2009) show that legal reform that seeks to make it easier or cheaper for divorce to occur, results in an increase in the divorce rates. Also, this increase in the divorce rates can be explained by the psychological hardship perspective theory which postulates that there is a positive relationship between unemployment and divorce which gets stronger, the longer the duration of being unemployed (Liker and Elder Jr 1983).<sup>1</sup> On the contrary, recent research has suggested an inverse relationship between the divorce rate and the unemployment rate. For example, a recent

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<sup>1</sup> Such a result has been verified by researchers (Amato and Beattie 2011; Bumpass et al. 1991; Hansen 2005; Jalovaara 2003; Preston and McDonald 1979; Ross and Sawhill 1975) for both the US and European countries such as Finland and Norway. Amato et al. (2007) found that there were frequent thoughts of divorce associated with declining family incomes.

study that was undertaken on twenty-nine European countries shows that the unemployment rate negatively affects the divorce rate (González-Val and Marcén 2017) and Hellerstein et al. (2013), highlighted that the probability of divorce falls as the unemployment rate rises. Further to this, Okun's law tells us about the inverse relationship between unemployment and GDP. Recent literature shows that lower levels of GDP relative to the level of GDP of the previous year results in a reduction in the divorce rates by approximately the same magnitude (Jiménez-Rubio et al. 2016). It must be mentioned that the cost of divorce perspective, in contrast, postulates that it is more costly to divorce during a recession. Thus, during a recession there can either be an increase or a decrease in the divorce rates. Recent research by Jiménez-Rubio et al. (2016), shows that income and financial growth each share a positive relationship with divorce rates; their data shows that a 1% increase in income results in a 4 % increase in divorce rates.

Empirical evidence finds that the marital status, or more precisely being married, is a significant determinant of self-employment, especially among women (Blanchflower and Oswald 1998; Boden 1996; Carr 1996; Georgellis and Wall 2005; Le Anh 2000; Rees and Shah 1986; Renzulli et al. 2000; Taniguchi 2002). According to the social capital perspective, the total capital of both the husband and wife with regards to their levels of education increases their social networks, knowledge base, skills, resources and access to financing (Verbakel and de Graaf 2009). Furthermore, their joint experiences in the labour markets facilitate their transitioning into the self-employment realm. Simply, there is a marital surplus or joint utility function that can be maximized,<sup>2</sup> and which takes into consideration both pecuniary and non-pecuniary aspects. Hence, it is expected that a divorce will have an effect on the decision to embark on self-employment.

From a theoretical perspective, the standard microeconomic theory assumes that individuals are rational; all seeking to maximize their utilities. The same concept applies to the individuals' choice to be either self-employed or waged-employed. Once their expected utility arising out of being self-employed exceeds that of being waged-employed, there will be a transition or motivation towards self-employment. To illustrate, the seminal study by Rees and Shah (1986) concluded that rational individuals will transition into self-employment once they perceive that the expected earnings arising from self-employment will be greater than that of

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<sup>2</sup> For instance, researchers (Aldrich and Cliff 2003; Amarpurkar and Danes 2005; Hundley 2001; Stewart and Danes 2001) found a positive relationship between marriage and being self-employed.

being in paid employment. Similar conclusions were found by Taylor (1996) as well as Clark and Drinkwater (2000). Hence, it is not surprising that microdata and survey-based methods are commonly used to investigate empirically the propensities of the transitions into and out of self-employment. These studies, on average, conclude that the female self-employment rate is predominantly a function of social factors, while the male self-employment rate is mostly influenced by macroeconomic incentives.

Notwithstanding that the entry to the self-employment model builds upon rational individual decisions, the individual determinants can be aggregately represented at a suitable level, thus, making possible an evaluation from a macro perspective. Such macro levels studies can be conducted using time-series and macro panels (see Millán et al. 2013; Parker and Robson 2004; Thurik et al. 2008 ) and may provide additional insights into these issues by investigating the presence and nature of both the long and short run impacts of socio-economic factors on the self-employment rates. For example, it is important to know if the effect of economic factors on entrepreneurial decisions changes as the economy moves from short run to long run equilibrium and whether the estimated effects are different for males and females or have similar impacts. In the case of time series studies, most of them have been done in the UK and USA (Congregado et al. 2012; Cowling and Mitchell 1997; Parker 1996; Saridakis et al. 2014; Shane 1996) but are less used elsewhere.

Building upon the recent work by Saridakis et al. (2014) this paper enriches the literature by utilising time series data for Spain covering the Global Financial crisis of 2007 to 2008 and the Great Spanish Depression of 2008 to present. We also add to the literature with our investigation of the impact of divorces on self-employment over prolonged periods of economic hardships. From our results, the long run estimates suggest that unemployment pushes both males and females into self-employment. Controlling for unemployment, economic prosperity does not facilitate entrepreneurial activities in Spain and this is so especially for the women who opt for the more attractive and secure occupational choices which are offered in paid-employment. This raises important policy implications with regard to entrepreneurial policies and regulations that may act as barriers to Spanish entrepreneurs. We also find that a high divorce rate lowers the transition into entrepreneurial activities for both males and females. In contrast, our results show that in the short run, divorces have positive impacts on self-employment whereas, the macroeconomic factors are found to have a weak explanatory power.

Our study opens up potentially new debates in existing literature, with regards to studies done on less industrialized and even emerging economies.

The organization of our paper, which explains the origin of these results and their policy implications, is as follows: our literature review and hypothesis development are presented where the necessity pull theory is introduced chiefly to develop our first set of hypotheses and this is done likewise with the family model of economic strain for our second set of hypotheses in the subsequent section. The section following this highlights the data and methodology that is used in this paper to derive its findings. The empirical results, our conclusions and policy implications are presented in the penultimate and final sections respectively.

## **Literature Review and Hypothesis**

### **Self-Employment and the Macro Economy**

The relationship between self-employment and macro economy was not only a subject of intense research, but also of lively debate among experts. Buoyant economic conditions, according to the “prosperity pull” hypothesis, attracted rational citizens into self-employment as they perceived opportunities for enhancing their socioeconomic status (Catron 2014; Dawson et al. 2009). These types of entrepreneurial activities, of which self-employment was its most simplistic form, were opportunity entrepreneurship (Allen et al. 2007). In contrast, the “recession push” hypothesis states that adverse economic conditions such as recessions, which are characterized by high unemployment rates, push citizens into self-employment (Audretsch et al. 2002; Catron, 2014; Dawson et al. 2009; Martinez-Granado 2002; Terjesen and Amoros 2010). Put differently, the “recession push” hypothesis suggests that the self-employment rate increases during periods of high unemployment as generally there are very few favourable alternatives such as paid employment. It can therefore be argued that the entry into self-employment is a matter of survival and unemployment reduces the opportunity costs of being self-employed (Audretsch et al. 2002). Therefore, in times of economic hardship, both men and women are expected to be pushed into self-employment as necessity entrepreneurs (Acs et al. 2005; Allen et al. 2007). The empirical findings lent support to both sets of hypotheses, while the majority of time series studies found significant positive association between self-employment and unemployment,

supporting the recession push hypothesis (see Hamilton 1989; Parker 2008; Storey 1991; von Greiff 2009; Westhead and Cowling 1995).

To the above debate we also contributed studies that examined whether the state of the macro economy influenced men and women in a similar way. Existing studies suggested that women were less risk-tolerant than men (for example, Byrnes et al. 1999; Schubert et al. 1999; Verheul et al. 2012) and this may partly explain why they sought safer employment opportunities rather than embark on self-employment (see, for example, Hartog et al. 2002; Minniti et al. 2005; Polkovnichenko 2005; Reynolds et al. 2002; Yao et al. 2004). Actually, the fear of failure discouraged a third of the female population from starting a business (GEM 2003). However, there were non-pecuniary characteristics of self-employment (for example, flexibility, work family balance, achievement of self-determination) that attracted mainly women to start up a business (De Martino and Barbato 2003; Georgellis and Walls 2005; Greene et al. 2011; Kepler and Shane 2007; Kirkwood and Tootell 2008; Marlow and Mc Adams 2013; Taylor and Newcomer 2005). Another reason why individuals may choose self-employment over being employed is that they can spend time with their children and thus reduce the conflict between work and family life, particularly in the case of women (Beutell 2007; Bianchi 2000; Hyytinen and Ruskanen 2007).

Additionally, a prolonged adverse macroeconomic environment was also found to increase the female self-employment rates. For example, Alba-Ramirez (1994) and Glocker and Steiner (2007) found that longer periods of unemployment increased the likelihood of the transitioning into self-employment. Generally, women were predominantly viewed as necessity entrepreneurs who sought to balance their livelihoods in the face of limited labour alternatives (Allen et al. 2007; Arenius and Minniti 2005). This characterization of necessity entrepreneurs being predominantly women was generally of those in male headed households whose partners were directly affected by an adverse macroeconomic environment (Paul and Sarma 2008). Recent figures, for example, suggested that self-employment earnings fell at a faster rate than the employee's earnings since the start of the recent recession (Blanchflower and Levin 2015; D'Arcy and Gardiner 2014; Hatfield 2015). In this spirit, more recent time series evidence by Saridakis et al. (2014) showed that the state of the economy affected both men and women, and in some cases the economic factors had a stronger association within the latter gender group. Taking the above literature into consideration, in this paper we hypothesize that:



**H1a:** Economic conditions affect self-employment decisions of both women and men in the long run.

**H1b:** In the short run, economic conditions are more likely to be associated with male self-employment than female self-employment.

### **Self-Employment and Divorces**

The marital status, or more precisely being married, was empirically shown to be a significant determinant of self-employment, especially for women (Blanchflower and Oswald 1998; Blau 1985; Georgellis and Wall 2005; Le Anh 2000; Rees and Shah 1986). Precisely, women who were married as opposed to those who were single were more likely to be motivated towards self-employment (Boden 1996; Carr 1996; Renzulli et al. 2000; Taniguchi 2002). The social capital perspective put forward the view that the combined capital of husband and wife in terms of education increased their social networks, knowledge, skills, resources and access to financing (Verbakel and De Graaf 2009). Furthermore, their experiences in the labour markets had a positive effect on their transitioning into self-employment. In other words, there was a marital surplus or joint utility function, which took into consideration both pecuniary and non-pecuniary aspects, that could have been maximized. For instance, researchers (Aldrich and Cliff 2003; Amarapurkar and Danes 2005; Hundley 2001; Stewart and Danes 2001) found a positive relationship between marriage and self-employment.

Similarly, the self-employment experiences of one of the spouses can positively influence the other to do so (Parker 2008). Caputo and Dolinsky (1998) found that self-employed husbands had a positive influence in terms of confidence and experience on their wives who were entering self-employment. While the specialization hypothesis postulated that if the husbands were in the labour market, the probability of the wives transitioning into self-employment because of non-pecuniary motives increased. Budig (2006) found that marriage had a significant impact on women becoming self-employed. Specifically, it increased the likelihood by 53%. Additionally, he also found that having a spouse who was self-employed positively influenced the other to become so. Likewise, Bruce (1999) found that the probability of a married woman becoming self-employed almost doubled when her husband was also self-employed. He explained his findings by drawing upon Caputo and Dolinsky (1998), who hypothesized that being able to

benefit from the business skills of the husband and intra-family financial flows together reduced the risks associated with self-employment. Thus, the expected returns were larger. Overall, marital support decreased the burdens and demands of being self-employed (Carraco 1999). Due to the non-pecuniary and pecuniary motives, marriage can either respectively push or pull women into self-employment (Patrick et al. 2016).

However, all this can change as a consequence of divorce. Research has shown that during times of economic turmoil, there can be long lasting negative impacts on married couples (Edin and Kissane 2010; Hardie and Lucas 2010; Seccombe 2000; White and Rogers 2000) which can potentially affect their self-employment decisions and firm performance. For example, with divorces, the marital surplus no longer exists, marital assets are divided and family capital is reduced. Furthermore, the divorced man frequently has to bear the responsibilities of providing for his children from the previous marriage while at the same time providing for his new family (see Saridakis et al. 2014; Shapiro and Cooney 2007). Hence, the evidence above implies that marital losses may put the future prospects of their venture at risk and increase uncertainty which may lead to their seeking the certainties of paid employment. Also, divorce may have a great economic impact on a woman who loses her share in her husband's income and the marital economies of scale are no longer existent. In fact, the specialization hypothesis predicts that women will suffer a greater negative income shock resulting from divorce. However, it goes on to premise that this is so because men can utilize their own earnings and have greater labour market potential as during the marriage they usually develop their workplace human capital. In contrast, Keene and Reynolds (2005) found that because of family obligations more women, when compared to men, forwent the acquisitions of labour skills and experiences. This is termed the penalty of motherhood. However, since divorce increases the economic incentive to work, self-employment may be seen as a way of gaining work experience and related skills as well as supplementing alimony payments for women in the short run.

**H2a:** Divorce is negatively associated with female self-employment more than male self-employment in the long run.

**H2b:** In the short run, divorce may have a positive effect on self-employment, especially for females.

## Summary of Literature Review and Hypotheses

During economic recessions, individuals respond differently to the prevailing situation. The literature above highlighted the prosperity pull and the recession push hypotheses to elaborate on the responses by individuals. Studies have also shown that persons seek self-employment as necessity entrepreneurs above all other reasons during times of economic hardship, however we hypothesize that women and men react differently towards becoming self-employed during economic hardship. We also hypothesize that the impact of divorce leading to self-employment for women is different in the short run as opposed to the long run.

## Data

### Self-Employment Rate

We have self-employment, time-series data from 1977 to 2014 which were obtained from the Institute for National Statistics (the data used here includes the agricultural sector). Self-employment was commonly used as a proxy for entrepreneurial activity. Similar to previous work, we calculated the self-employment rate by dividing the number of total self-employed,  $SE_{(Total)}_t$  by the total workforce. In like manner, we estimated the male,  $SE_{(Male)}_t$ , and female,  $SE_{(Female)}_t$ , self-employment rates by dividing the male and female self-employment numbers by their corresponding workforce numbers.

In Figure 1 we plotted the annual total, male and female, self-employment rates for the last four decades and it was revealed that until the mid-1980s, the Spanish female self-employment rates were actually higher than those of the male. Since then, female waged employment activities started to increase substantially and at the same time, there was a precipitous free fall of the female self-employment rates. In fact, in Spain, a report by the OECD (2016) sighted that educated women earned 82% of what men earned (with the OECD average being 73%) which may explain a shift to a less risky sector. It was only until the early 2000's that the female self-employment rates started to stabilize. However, after the crisis, there was a decline in the female self-employment rates, but within recent years they were stabilized. In contrast, between the mid-1970's and the early-1990's the male self-employment rates only experienced small fluctuations, to then fall steadily before recovering in the mid-2000's. However, just after the mid-2000's was the epoch of the crisis and further pressures were put on

enterprise activities. Regardless, since 2010, both the male and female self-employment rates have been increasing. However, the male self-employment rates have been increasing at thrice times the rates of the females (1.6% versus 0.5%)<sup>3</sup>.

[Figure 1 about here]

### **Independent Socio-Economic Variables**

Similar to what was done as mentioned previously, we used the gender-specific unemployment rate ( $UNEM_t$ ), the ratio of self-employment to employee income ( $INCOM_t$ ) and the Gross Domestic Product per capita at constant prices ( $GDP_t$ ). We expected  $UNEM_t$  and  $INCOM_t$  to carry a positive sign, whereas,  $GDP_t$  could have carried either a positive (through the creation of opportunities as the economy grew) or a negative sign (since higher wages increased the opportunity cost of self-employment). We employed the divorce per 100 marriages ( $DIVR_t$ ) which was extracted from Eurostat,<sup>4</sup> to capture changes in family circumstances and the potential effect that this may have had on self-employment decisions. Although divorce may have increased labour supply, especially for women (see Duncan and Hoffman 1985), the expected sign of  $DIVR_t$ , was expected to be negative in the long run because it was possibly driven by lower capital, network, and information sharing as well as time constraints that occurred after marriage dissolution. However, since the  $DIVR_t$  was available from 1981 and  $INCOM_t$  due to methodological breaks provided comparable data up to 2011, we restricted our estimation sample to the period between 1981 and 2011. Table 1 below provides the summary statistics of the (unlogged) independent variables used in the regression.

[Table 1 about here]

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<sup>3</sup> Based on our estimates during 2011-2014.

<sup>4</sup> The data on divorce and self-employment to employee income ratio are not distinguished by gender, due to data limitations available to us.

## Statistical Approach

OLS regression assumes stationary time-series. Hence, our first empirical task was to examine the order of integration of the natural logarithms of the variables ( $L$  denotes natural logarithms):  $LSE_{it}$ ,  $LUNEM_{it}$ ,  $LINCOM_{it}$ ,  $LGDP_{it}$ , and  $LDIVR_{it}$ . In this paper, we used the Zivot and Andrews (1992) test where a series follows a unit root process. The latter test was used to avoid the problems that the traditional unit root tests, such the Augmented Dickey–Fuller (ADF) and Phillips and Perron (PP), encountered with structural breaks and as a result failed to reject the unit root hypothesis in such a series.<sup>5</sup> The results from the Zivot and Andrews (1992) tests are presented in Table 2. The results generally suggest that the variables become stationary after taking the first difference, so the variables are said to be integrated of order one,  $I(1)$ .<sup>6</sup>

[Table 2 about here]

We then proceeded to employ cointegration methodological analysis in order to have meaningful regressions with our  $I(1)$  variables. In order to interpret our estimated coefficients as elasticities, we considered a double-log regression model and used the vector autoregressive (VAR) methodology proposed by Pesaran and Pesaran (1997).<sup>7</sup> This approach allowed us to take into consideration the non-stationary properties of the data, maintain important long run information and avoid spurious correlations (see Entorf, 1997). The underlying VAR model did not contain deterministic trends, but contained unrestricted intercepts.<sup>8</sup>

To confirm the existence or the nonexistence of a long run relationship in the presence of a structural break, the Johansen cointegration analysis was complemented by estimating the residual based test proposed by Gregory and Hansen (G-H) (1996a). For example, one may argue

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<sup>5</sup> For example, González-Val and Marcén (2012), examining 16 European countries, show that shocks such as divorce-law reforms may affect divorce rates permanently.

<sup>6</sup> We found that total unemployment rate may have been integrated of order 2 suggesting that unemployment was highly persistent in Spain. However, the gender specific unemployment rates provided evidence that the series may have been integrated of order 1. For the purpose of this work, we continued our analysis treating UNEM (Total)  $t$  as  $I(1)$ .

<sup>7</sup> The model allowed for potential endogeneity between the self-employment rate and unemployment (see discussion in Thurik et al. 2008) where increased self-employment rates may have reduced subsequent unemployment rates. Indeed, the unemployment rate variable was found to react to disequilibrium (with p-value less than 0.01) suggesting that the assumption of weak exogeneity was valid or the other variables were treated as weakly exogenous. We also experimented by estimating a model that allowed for the divorce rate to be endogenous in the system since self-employment may have affected marital stability (Cameron et al. 1997). Our results remained generally robust to this specification.

<sup>8</sup> The specification allows a linear time trend in the levels of the data.

that if the errors of the cointegrating regression captured an uncounted break, this may result in evidence against cointegration. The test was built on Zivot and Andrews (1992) and Perron (1989) and was the natural extension of their earlier work (Gregory and Hansen 1996b). Similar to unit root tests, which were discussed above, ignoring the potential existence of a break reduced the power of the Johansen cointegration test. The general G-H approach allowed for changes to the intercept, slope coefficients and trend coefficients. It also included the standard ADF test ( $= \inf_{\tau \in J} ADF$ ) and Phillips and Ouliaris (1990)  $Z_t (= \inf_{\tau \in J} Z_t)$  and  $Z_a (= \inf_{\tau \in J} Z_a)$  statistics, and allowed for a one-time structural break of unknown timing. As discussed in Gregory and Hansen (1996b), the test statistics focused on the smallest values of the above statistics.

## Empirical Results

### Testing for the Existence of a Long Run Relationship

Table 3 summarizes the results of the Johansen<sup>9</sup> and Gregory-Hansen cointegration analysis (including one-lag chosen by  $t$ -statistics) for the self-employment models. The maximum eigenvalue statistic rejected the null hypothesis of no cointegrating vectors in favour of exactly one cointegrating vector ( $r=1$ ) for the overall and gender-specific models. Similarly, the Gregory-Hansen structural break test provided further evidence in favour of cointegration among the variables of our study by rejecting the null hypothesis of no cointegration with the endogenously determined break.

The G-H results indicated that there was a potential structural break in the trend of the male and female self-employment series during the 1980's and/or 1990's. The potential breaks may have been related to the transitory period of the joining and accession of the European monetary union and employment protection legislation reforms that took place during these eras. The rejection of the null hypothesis of “no cointegration”, however, does not necessarily imply that there is a break in the cointegrating vector. This is simply because the test has power against a time-invariant cointegrating relation (Gregory and Hansen 1996a). Importantly, both tests

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<sup>9</sup> In order to determine the order of the VAR we ran an unrestricted VAR of order 4 by separating the endogenous and exogenous variables and including an intercept. The log-likelihood ratio (LR) statistics test selected order  $p=3$  for the overall and gender specific self-employment models.

provide strong evidence of the existence of a long run relationship between self-employment and socio-economic variables in Spain. The long run equations normalized on the log of self-employment rate,  $LSE_{it}$ , are presented and discussed below.

[Table 3 about here]

### **Long-Run Estimates**

The Johansen test was normalized on the log of real self-employment ( $LSE_{it}$ ) and the results are presented in Table 4.<sup>10</sup> Specifically, they showed that for both the males and females the long run coefficients of unemployment and the ratio of self-employment to employees' earnings were positive, but on the other hand, the coefficients of GDP per capita and divorce rate were negative. Some interesting results emerged from the gender-specific models. Our results suggest that unemployment has similar long run effects in terms of direction for both the males and females in Spain ( $\chi^2(1) = 0.71[0.40]$ ). Thus, these results give support for the recession push hypothesis.

The coefficient of the ratio of self-employment to employees' earnings was found to be positive and statistically significant for all the models. In particular, we found that a 10% increase in self-employment to employee income ratio increased the self-employment rates by about 11.7% and 13.9% for males and females, respectively. However, when we tested the null hypothesis that the coefficients were equal to each other, we found that the hypothesis could not be rejected ( $\chi^2(1) = 0.13[0.71]$ ).

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<sup>10</sup> Following the suggestion by the referee, we have also estimated the model including the fertility variable in the specification. For example, self-employment can be viewed as a strategy to solve the conflict between work and family life for women. Hence, mothers may choose to be self-employed in order to have greater flexibility in working hours, allowing them to spend more time with their children (Beutell 2007; Bianchi 2000; Hyytinen and Ruskanen 2007). Our results showed no long run or short run effects of fertility rate on male self-employment. In contrast, for females we found that the fertility rate had a positive and statistically significant long run elasticity of 1.273 [ $\chi^2(1) = 5.2766, p = 0.022$ ]. However, the inclusion of this variable alters the relationship between the economic variables and self-employment, with the coefficient of GDP becoming statistically insignificant. We suspect that this is driven by a potentially strong relationship between fertility decision and growth prospects. Demographic data are better analyzed within panel data framework in which geographical variations and control for a wide range of other factors (for example, age of children, marital status, and presence of grandparents in the household) can be considered in the modelling specification. We therefore leave this important aspect for future research.

As the state of the economy improves, as proxied by GDP per capita, both men and women will opt for paid employment, as evidenced by the negatively signed coefficient. Interestingly, we find that the effect of economic prosperity has a greater impact on the women as compared to the men, since the magnitude of the effect is thrice times greater. Moreover, suggesting that they are more likely than the men to exit self-employment to seek the security of suitably paid employment. The log-likelihood ratio statistic for testing the restriction that the GDP per capita coefficients are equal between the two genders is given by  $\chi^2(1) = 10.36$ , which is statistically significant, hence, this suggests that the restriction of the equality of the coefficients is rejected, and the effect differs in magnitude by gender.

[Table 4 about here]

The above findings suggest that women, during economic prosperity opt for the more attractive occupational choice which is paid-employment, since the opportunity cost of self-employment is higher and more secure jobs are available. Similarly, Hughes (2006) found that, of the male and female entrepreneurs, while 71% of the males were opportunistic entrepreneurs this was so for only 53% of the females. This suggests that more men are opportunistic entrepreneurs, who are willing to take risks while the risk averseness of women makes them opt for the security of paid employment. In other words, men are more likely to be pulled into self-employment, whereas women tend to be pushed into it out of necessity.

It must be noted that Saridakis et al. (2014) found in the long run that macroeconomic conditions of economic prosperity in the UK resulted in a negatively signed coefficient for women, and a positive one for men. Whereas our results reveal that the long run effect of adverse macroeconomic conditions is negative for both genders. The differing entrepreneurial choices made by men from the UK and Spain under similar economic conditions may suggest that there are some institutional and regulatory factors that may act as barriers to potential Spanish entrepreneurs. For example, according to the World Bank (2016) report, the United Kingdom ranked 17 and 19 respectively, whereas Spain's rankings in the same areas were 82 and 59, in "starting a business" and "getting a credit."

Turning to family circumstances, the divorce variable was found to carry a negative sign which suggests that in the long run, divorces have a negative impact on the transition into self-



employment. These results are consistent with the findings of researchers (Boden 1999; Carr 1996; Parker 2008; Saridakis et al. 2014) who stress the importance of marital status on the choice to become an entrepreneur. The interesting finding of this study, however, is that divorce has equally devastating consequences on male and female entrepreneurship. An  $\chi^2$  test variate with 1 degree of freedom suggests that the effects are similar in magnitude ( $\chi^2(1) = 0.65[0.42]$ ).

To sum up, the long run estimates show that economic factors affect both men and women, providing support for H1a. Additionally, although our results find a negative link between self-employment and divorce, they fail to find any significant gender differences in their impact, as both are equally negatively impacted. The latter finding provides no gender support for H2a.

### **Short Run Estimates**

Turning to the short run estimates of the self-employment model (Table 5), we found that the error correction terms for the total and gender-specific models were negative and statistically significant. Specifically, we found that a 10% shock away from the long run equilibrium in the current year was corrected by a 3.1% in the subsequent year. However, the error correction coefficient for the female self-employment model was found to be larger than the one for males, suggesting faster speed of convergence to equilibrium.

We also found the economic variables to have weak explanatory powers in the short run. It is possible that as a consequence of the adverse economic conditions, there is a lack of sufficient pull factors necessary for opportunistic self-employment which is more likely to operate in the short run. However, as the periods of economic decline were prolonged, the push factors came into prominence, as both men and especially women were pushed into self-employment out of necessity. Only the unemployment rate was found to be statistically significant in the female equation. In contrast to the long run estimates, the short run coefficient of unemployment carried a negative sign. Thus, suggesting that females are deterred from becoming entrepreneurs in the short run because of economic hardship and uncertainty, but eventually they are pushed to self-employment if their high unemployment rates persist in the long run. Given these findings, we came across no evidence to support H1b.

In contrast to economic variables, the divorce rate was found to affect both males and females in the short run. In particular, this was positive and had a similar magnitude of effect for both genders. Perhaps, self-employment may constitute a means of adjustment to new personal circumstances and compensates for the loss of the spouse's income, but the effect may not be long-lasting. Given that this finding is applicable to both genders, thus, H2b is partially supported.

[Table 5 about here]

## **Limitations**

Despite the new insights and debates that our study brings to the entrepreneurial literature, there are limitations. Firstly, self-employment attitude is a complex phenomenon that requires further theoretical and empirical attention. To this end, the use of large scale panel data may shed more light into the long run and short run dynamics of self-employment choices. Furthermore, it will also allow for the examination of specific disaggregate factors, such as sectoral compositions and regional differences. Secondly, the analysis does not consider the effect of dissolution of out of marriage arrangements such as cohabitation. Although cohabiting couples are more likely to separate than married ones (for example, Goodman and Greaves 2010), their financial condition is more likely to be better, as compared to that of the married person after separation.

## **Conclusion and Policy Implications**

The prolonged state of an economic crisis may lead towards job losses, as such individuals may look to alternative ways to earn a living such as becoming self-employed. This paper employed cointegration analysis with and without structural breaks to investigate the existence and nature of the long and short run relationships among the self-employment (total, male and female) and socio-economic independent variables in Spain. The importance of this paper is to examine the nature of the relationship between adverse economic conditions and the self-employment decisions of men and women as well as to investigate how divorce affects women's self-employment decisions in the short run and long run. Overall, our empirical results provide strong support for the viability of recession push hypothesis in the long term and to a lesser extent

prosperity pull hypothesis in the short term. Also, our study reveals that the ratio of self-employment to employees' earnings and the unemployment rate both positively impact on the self-employment rates in the long run. However, as the state of the economy improves as proxied by GDP per capita, self-employment rates decline. In the short run, however, the results reveal that the latter economic variables are relatively weak in explaining self-employment rates. We also find that the divorce rates have an overall negative impact on the self-employment rates in the long run. In fact Wang and Parker (2014) put forward the view that the decline in the US self-employment rates could have been a consequence of the decline in the marriage rates.

The importance of our findings is that this information can be provided to policy makers, who promote self-employment opportunities, so that they can utilize it in their decision making processes. For instance, Aldrich and Cliff (2003) and Renzulli et al. (2000) postulated that the resource mobilization processes, which were a key determinant for self-employment were negatively impacted by divorces. As a consequence, this could have led to the failure of start-up businesses. Hence the implication of the findings of the research is to provide support programs such as creating professional service firms to assist individuals to manage effectively the new role relationships that emanate out of divorce could be viable (Aldrich and Cliff 2003). This would auger well for the long run sustainability of the businesses that are created both during marriages and in circumstances of divorces. Additionally, programs can be introduced to allow for the development of the entrepreneurial mind-set. Essentially, the Spanish policy makers should initiate hybrid services that provide both financial (hard) and non-financial (soft) support, as both of these are negatively impacted by divorces (see Sheehan and Mc Namara 2015).

Finally, further macro studies for different countries can explore different and interesting long run and short run patterns that can explain regional convergence in self-employment rates.

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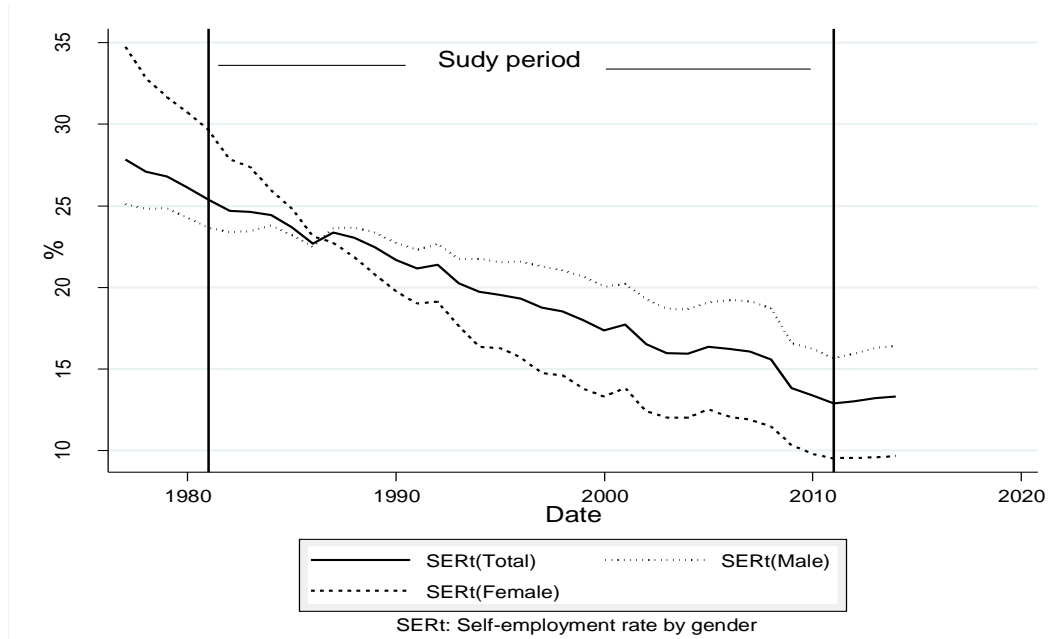
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**Figure 1.** Spanish self-employment rates by gender (%)



**Table 1.** Summary statistics of the (unlogged) independent variables. 1981-2011

Variable(s)	$UNEM(Total)_t$	$UNEM(Male)_t$	$UNEM(Female)_t$	$INCOM_t$	$GDP_t$	$DIVR_t$
Maximum	24.1	21.0	31.6	2.1	24274.3	65.3
Minimum	8.2	6.4	10.7	1.1	2712.6	4.7
Mean	16.7	13.8	21.7	1.5	13011.5	23.8
Std. Dev.	4.7	4.6	6.1	0.3	7300.4	19.5

$UNEM_t$ : Unemployment rate by gender.  $INCOM_t$ : The ratio of self-employment to employee income.  $GDP_t$ : Gross Domestic Product per capita at constant prices.  $DIVR_t$ : Divorce per 100 marriages. The economic variables were extracted from the Institute for National Statistics where the divorce data were collected from Eurostat.

**Table 2.** Unit root test , 1981-2011

	Levels	First Differences
$LSER(Total)_t$	-3.017	-6.044 *
$LSER(Male)_t$	-2.778	-5.884 *
$LSER(Female)_t$	-3.414	-6.744 *
$LUNEM(Total)_t$	-2.819	-3.574
$LUNEM(Male)_t$	-3.731	-4.428 **
$LUNEM(Female)_t$	-2.233	-4.232 †
$LINCOM_t$	-1.730	-8.189 *
$LGDP_t$	-1.714	-5.167 *
$LDIVR_t$	-3.568	-4.292 †

$L$  denotes natural logarithms.  $SER_t$ : Self-employment rate by gender.  $UNEM_t$ : Unemployment rate by gender.  $INCOM_t$ : The ratio of self-employment to employee income.  $GDP_t$ : Gross Domestic Product per capita at constant prices.  $DIVR_t$ : Divorce per 100 marriages.

Critical values allowing for break in trend: \* $p < 0.01$ : -4.93 \*\* $p < 0.05$ : -4.42 † $p < 0.10$ : -4.11.

\*, \*\* and † indicate rejection of the unit root null hypothesis at the .01, .05 and .10 significance levels, respectively.

Only the t-statistic of the  $UNEM (Total) t$  variables is found to be smaller than the reported critical value. This may suggest that total unemployment rate may be integrated of order 2 suggesting that unemployment is highly persistent. Given, however, that the gender specific unemployment rates provide evidence that the series may be integrated of order 1, we continue our analysis treating  $UNEM (Total) t$  as  $I(1)$ .

**Table 3.** Cointegration LR test based on Maximal Eigenvalue of the Stochastic Matrix and Gregory-Hansen Structural Break Test

Null	Alternative	Eigenvalues	Statistics	95% critical value
<i>LSER(Total)<sub>t</sub>, LUNEM(Total)<sub>b</sub>, LINCOP<sub>b</sub>, LGDP<sub>b</sub>, LDIVR<sub>t</sub></i>				
1981-2011 (lag=3)				
$r=0$	$r \geq 1$	0.67	31.53*	24.22
$r \leq 1$	$r \geq 2$	0.16	4.76	16.90
1981-2011 (lag=1)				
	Test statistic	Break	10%	5%
<i>ADF</i>	-8.11*	1991	-6.58	-6.84
<i>Zt</i>	-7.06*	1998	-6.58	-6.84
<i>Za</i>	-38.34	1998	-82.30	-88.47
<i>LSER(Male)<sub>t</sub>, LUNEM(Male)<sub>b</sub>, LINCOP<sub>b</sub>, LGDP<sub>b</sub>, LDIVR<sub>t</sub></i>				
1981-2011 (lag=3)				
$r=0$	$r \geq 1$	0.74	37.40*	24.22
$r \leq 1$	$r \geq 2$	0.09	2.66	16.90
1981-2011 (lag=1)				
	Test statistic	Break	10%	5%
<i>ADF</i>	-7.02*	1992	-6.58	-6.84
<i>Zt</i>	6.74 <sup>†</sup>	1985	-6.58	-6.84
<i>Za</i>	-37.29	1985	-82.30	-88.47
<i>LSER(Female)<sub>t</sub>, LUNEM(Female)<sub>b</sub>, LINCOP<sub>b</sub>, LGDP<sub>b</sub>, LDIVR<sub>t</sub></i>				
1981-2011 (lag=3)				
$r=0$	$r \geq 1$	0.65	29.19*	40.12
$r \leq 1$	$r \geq 2$	0.22	7.09	16.90
1981-2011 (lag=1)				
	Test statistic	Break	10%	5%
<i>ADF</i>	-8.55*	1997	-6.58	-6.84
<i>Zt</i>	-6.68 <sup>†</sup>	1986	-6.58	-6.84
<i>Za</i>	-36.88	1986	-82.30	-88.47

*L* denotes natural logarithms. *SER<sub>t</sub>*: Self-employment rate by gender. *UNEM<sub>t</sub>*: Unemployment rate by gender. *INCOM<sub>t</sub>*: The ratio of self-employment to employee income. *GDP<sub>t</sub>*: Gross Domestic Product per capita at constant prices. *DIVR<sub>t</sub>*: Divorce per 100 marriages.

\* and <sup>†</sup> suggest that the null hypothesis of “no cointegration” is rejected at the  $p < .05$  or  $p < .10$  significance level, respectively.



**Table 4.** Cointegration Coefficients, Johansen ML approach,  
1984-2011

Variable(s)	$LSER(Total)_t$	$LSER(Male)_t$	$LSER(Female)_t$
$LUNEM(Total)_t$	0.303* [0.000]		
$LUNEM(Male)_t$		0.321* [0.000]	
$LUNEM(Female)_t$			0.250* [0.000]
$LINCOM_t$	1.202* [0.003]	1.173* [0.001]	1.393* [0.001]
$LGDP_t$	-0.381* [0.000]	-0.212* [0.000]	-0.645* [0.000]
$LDIVR_t$	-0.213* [0.000]	-0.263* [0.000]	-0.187* [0.001]

$L$  denotes natural logarithms.  $SER_t$ : Self-employment rate by gender.  $UNEM_t$ : Unemployment rate by gender.  $INCOM_t$ : The ratio of self-employment to employee income.  $GDP_t$ : Gross Domestic Product per capita at constant prices.  $DIVR_t$ : Divorce per 100 marriages.

The p-values of the LR statistic distributed as  $\chi^2$  are given in the square brackets. \* denotes significance at the  $p < .05$  level.

**Table 5.** Error correction OLS estimates, 1984-2011

Regressor	$\Delta LSER(Total)_t$		$\Delta LSER(Male)_t$		$\Delta LSER(Female)_t$	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
<i>Constant</i>	1.724*	0.621	1.156*	0.438	2.729*	1.144
$\Delta LSER k, t-1$	-0.154	0.248	-0.256	0.207	-0.098	0.295
$\Delta UNEM k, t-1$	-0.008	0.055	-0.035	0.041	0.031	0.094
$\Delta LSER k, t-2$	-0.393	0.226	-0.215	0.193	-0.513 <sup>†</sup>	0.291
$\Delta LUNEM k, t-2$	-0.114	0.073	-0.075	0.068	-0.169 <sup>†</sup>	0.096
$\Delta INCOM_{t-1}$	-0.144	0.158	-0.071	0.142	-0.305	0.242
$\Delta LGDP_{t-1}$	0.238	0.157	0.172	0.154	0.230	0.216
$\Delta LDIVR_{t-1}$	0.151*	0.043	0.151*	0.043	0.150*	0.058
$\Delta LINCOM_{t-2}$	-0.184	0.144	-0.156	0.122	-0.282	0.227
$\Delta LGDP_{t-2}$	0.010	0.167	0.024	0.167	-0.069	0.224
$\Delta LDIVR_{t-2}$	0.074*	0.028	0.082*	0.027	0.068*	0.038
$ECM_{k, t-1}$	-0.308*	0.106	-0.268*	0.096	-0.351*	0.143
R-Squared	0.696		0.75		0.586	
F(11,16)	3.325[0.015]		4.357[.004]		2.062[0.091]	
Serial Correlation F(1,15)	4.841[0.044]		3.730[0.073]		1.419[0.252]	
Functional Form F(1,15)	0.639[0.437]		1.450[0.247]		0.000[0.998]	
Normality	2.628[0.269]		1.375[0.503]		2.466[0.291]	
Heteroscedasticity F(1,26)	0.577[0.454]		1.433[0.242]		0.229[0.636]	

*L* denotes natural logarithms.  $SER_t$ : Self-employment rate by gender.  $UNEM_t$ : Unemployment rate by gender.  $INCOM_t$ : The ratio of self-employment to employee income.  $GDP_t$ : Gross Domestic Product per capita at constant prices.  $DIVR_t$ : Divorce per 100 marriages.

*k* takes values from 1 to 3, where 1 is for the total sample, 2 for the male sample and 3 for the female sample. \* and <sup>†</sup> denote significant at the  $p < .05$  and  $p < .10$  level, respectively.

$$ECM(Total) = 1 * LSER(Total) - 0.303 * LUNEM(Total) - 1.202 * LINCOM + 0.381 * LGDP + 0.213 * LDIVR$$

$$ECM(Male) = 1 * LSER(Male) - 0.321 * LUNEM(Male) - 1.173 * LINCOM + 0.212 * LGDP + 0.263 * LDIVR$$

$$ECM(Female) = 1 * LSER(Female) - 0.250 * LUNEM(Female) - 1.392 * LINCOM + 0.645 * LGD + 0.187 * LDIVR$$

We also include dummies to capture structural changes occurring in the 1980s and 1990s. However, the coefficients are found to be statistically insignificant. Similarly, we experimented by including a dummy to capture potential effects of the recent economic crisis. But again we find insignificant effects.