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Stock returns, industry concentration and firm expenditure decisions

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ABSTRACT

We build on agency and strategy literature to investigate and explain whether and how changes in stock returns are related to critical managerial expenditure decisions by firms that are consistent and supportive of the firm's strategy in different industry concentrations. Unlike previous work, our study considers the impact of an extended list of managerial expenditure decisions in the different industry concentration settings. Our research employs a rich panel of firms listed on the UK London Stock Exchange. We find strong support for our postulations. Key managerial expenditure decisions we considered, leverage, inventories turnover, R&D intensity, SGA and fixed asset additions have a differential impact depending on the industry concentration. Our findings add to our understanding of the effect of managerial agency and its integration to strategy on firm stock returns. Managerial expenditure decisions are both constrained by the competitive context as well as strategic logic – both of which impact stock returns. Our study helps managers to prioritize consequential expenditure decisions in different competitive contexts – a key resource for not only weathering crisis periods but optimizing returns to shareholders.

1. Introduction

The purpose of this study is to examine implications of key managerial expenditure decisions of firms in different industry concentrations to the firm's stock returns. In the tech sector for example, platform companies such as Google and Facebook dominate business to the exclusion of potential entrants or weaker or smaller companies. The UK Competition and Markets Authority, (CMA) released a report recently on the Tech sector which showed the extent of the dominance as evidenced by the high industry concentration and the effect on profits and stock returns.

Current debates include managerial expenditure decisions reflected by measures such as advertising productivity (Rahman, Rodriguez-Serrano & Hughes, 2020) or innovation (Su, Guo & Sun, 2017; Damanpour, 2017) relates to performance as moderated by market conditions. Other past works (e.g., Titman, 1984; Mackay and Phillips, 2005; Almazan and Molina, 2005; Cohen, Polk & Vuolteenaho, 2003; Hou & Robinson, 2006; Michis, 2016; Lemma et al., 2018; Zheng et al., 2021; Rakshit & Bardhan, 2022; Rahaman et al., 2022) have also examined how industry concentration and managerial expenditure decisions as reflected by measures such as leverage relate to stock returns. A key theoretical assumption in these studies is that industry concentration and managerial

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expenditure decisions inter-relate to affect riskiness of cashflows and hence stock returns. In other words, industry concentrations reflect strategic interactions between firms either giving rise to (or arising from) operating and financial decisions and this then affects expected stock returns performance.

Past work has either focused on one specific managerial expenditure decision (Rahman, Rodriguez-Serrano & Hughes, 2020; Su, Guo & Sun, 2017; Damanpour, 2017; Muradoğlu and Sivaprasad, 2012) or on variations of performance within just one industry concentration context (Hou and Robinson, 2006; Mackay & Phillips, 2005) and their link to firm performance. However, our study considered the impact of a broader set of managerial expenditure decisions and how they relate to stock returns across different industry concentration scenarios. Our study considers the role of inventories turnover, leverage, R&D intensity, Selling and General Administration (SGA) ratio and Fixed asset turnover – first presented by Finkelstein and Hambrick (1990) as the key managerial expenditure decisions that are supportive of and should be consistent with a firm's strategy.

Our main indicator for change in value is excess stock returns. Excess returns are a market-based measure of performance that considers the returns to the investors in excess of the risk-free rate. This way we measure the effect of the announcement of corporate statements on the value of the firms using financial market data. Impact of corporate information on valuation of the firm will be incorporated gradually in our estimates that allow for a year of cumulative returns. Therefore, they can be interpreted as indicative of performance persistence and are used extensively in examining the long-term performance of initial and seasoned public offerings and mergers and acquisitions (see, Ritter, 1991; Franks, Harris, and Titman, 1991 for pioneering work in these areas).

Furthermore, we examine whether the managerial financial and operating decisions relate to stock returns differently across industry concentration settings when economic distress risk is considered. Periods of a global financial crisis such as the 2008 financial crush, represents an exogenous shock introducing negative aggregate demand across industries in different competitive settings. A key question will be the sensitivity of operating and financial decisions to stock returns in such conditions?

By exploring the impact of key managerial expenditure decisions on stock returns in different industry concentration settings, we contribute by enhancing our understanding of the interaction effects of two value creating causal mechanisms in strategy (e.g., Makadok, 2011). We also incorporate governance theory explanations together with strategy to better explore how debt capital allocations across different industry concentration settings are reflected in changes in stock returns. Third, we provide an empirical investigation of the impact of the key managerial expenditure decisions on stock returns in different industry concentration settings. We extract managerial implications regarding how shareholder value and operational and financial decisions at the firm level can be unlocked in different industry concentration settings.

Finally, we also provide a methodological contribution by employing advanced econometric techniques that improve upon previous empirical work examining the relationships between industry concentration, managerial expenditure decisions, and firm performance. While some prior studies have utilized standard regression methods (e.g., Hou & Robinson, 2006; Mackay & Phillips, 2005), our analysis leverages more sophisticated approaches to address potential econometric issues and provide more reliable estimates. Specifically, we employ mixed linear models, also known as multilevel or hierarchical linear models (Raudenbush & Bryk, 2002; Snijders & Bosker, 2012). These models account for the nested structure of the data, with firms clustered within industries, and allow for the inclusion of both fixed and random effects. By incorporating random effects at the firm, industry, and year levels, we can control for unobserved heterogeneity and address potential endogeneity concerns arising from omitted variable bias (Bliese et al., 2020; Gormley & Matsa, 2014). This approach provides more accurate estimates and standard errors compared to traditional regression techniques.

Furthermore, we complement our main analysis with dynamic panel methods, such as the Arellano-Bond estimator (Arellano & Bond, 1991). These methods are designed to handle endogeneity issues arising from simultaneity, unobserved heterogeneity, and dynamic relationships between variables (Roodman, 2009). The dynamic panel approach accounts for the persistence of firm performance over time and allows for the inclusion of lagged dependent variables as explanatory factors. By employing these advanced techniques, we aim to provide more reliable and robust estimates of the relationships under investigation.

The paper is organised as follows. The next section discusses theory and develops some hypotheses. The methods used are then explained and next, the results are presented and analysed, before concluding with a discussion and conclusions.

2. Theory and hypotheses

The link between industry concentration, managerial operational and financial decisions by firms and stock returns value is not obvious. Industry concentrations reflect conditions in arenas (structures) in which firms face different competitive conditions that cannot be fully explained by one theoretic approach. A deterministic perspective (structure-conduct-performance paradigm: Bain, 1954) views structures as shaping strategic interactions between firms in an industry. For example, firms in more concentrated industries enjoy significant entry barriers that may be natural (i.e., the nature of production technology is capital intensive and entails high fixed costs) or from government regulation of pricing and market entry. Such firms are more likely to employ rivalry restraint mechanisms of tacit or explicit collusion among rivals and make operational or financial decisions that are similar (e.g., Makadok, 2011).

Firms in more concentrated industries can earn supernormal profits because they can artificially raise customer prices (or lowering input costs) to benefit at the expense of their customers and/or suppliers without arousing entry from competitors. Such firms are better able to weather downturns using their profit cushion and will not face industry exit – hence with less distress risk, firms in more concentrated settings have been found to earn low expected stock returns (Hou and Robinson, 2006). Operational and financial decisions taken by such firms to support strategy have been found to be much more sensitive and aligned to peer reactions within their industries, but research has not compared differences across industries of varying concentration.

A less deterministic view is based on how strategic choices of firms can also help firms to avoid or mitigate the intensity of competition. For example, firms in less concentrated industry settings care more likely to make different financial and operating decisions because they are likely smaller, and often on the fringes of established industries and compete by ushering in new technological paradigms such as in the gig economy – establishing new industries or overturning status quo using innovation. In more concentrated industries, there is said to be less innovation because firms will tend to consolidate existing product market positions for economic reasons (existing products are most profitable) and their established value-chain networks present organizational inertia (e.g., Hill & Rothaermel, 2003).

According to the logic of the above argument - whilst firms in less concentrated industries are more likely to have risky innovative activities, and hence increased firm turnover and economic growth, which will result in higher expected average stock returns, more concentrated industries will have less innovation and low average returns. However, in either theoretical view, linkages between industry concentrations and returns are predicated on operational and financial decisions that are supportive or reflective of the strategies of firms in the different competitive settings, an issue that we seek to examine more closely.

In this study, we examine key managerial strategic decisions as proposed by Finkelstein and Hambrick (1990) – and inspired by literature that conceived strategy as a pattern in a stream of important decisions (Mintzberg, 1978). Finkelstein and Hambrick (1990) justify the choice of these decision dimensions as they are potentially controllable by firms or specifically by top managers and have an important effect on firm performance as each decision is complementary, each focusing on an important but specific aspect of the firm's strategic profile and lastly that they are amenable to data collection and have relatively reliable comparability across firms within an industry. The authors further state that the dimensions have all been used in previous strategy research: Advertising intensity, R&D intensity, and plant and equipment newness, are basic resource allocations, the SGA to sales ratio addresses a firm's expense structure and inventory to sales ratio measures production cycle time and working capital management, and the debt to equity ratio is an accepted measure of financial leverage (Buzzell, Schoeffler, & Heany, 1974; Schendel & Patton, 1978).

2.1. The impact of financing decisions on stock returns in different industry concentration settings

Firms must decide on how to fund growth opportunities – a key financing decision is leverage. Even though some studies find that smaller firms tend to use more leverage (Govindarajan et al., 2019; Strebulaev & Yang, 2013) than average industry established players, the impact on stock returns still has theoretical ambiguity: whether funding through debt is relatively more penalised by the market in less concentrated industries than in more concentrated settings - and hence whether abnormal returns may then accrue to less leveraged rather more leveraged firms in those settings?

Leverage decisions are critical as a change in a firm's approach to leverage can increase or decrease the financial strain on the firm and affect the firm's performance (Findlay & Williams, 1987). Several studies examine the leveraging choices that managers face.[1] Debt financing benefits include helping to shield income from taxes and lowers the overall cost of capital of the firm. These benefits must be weighed against risks of financial distress and bankruptcy and the attended consequences (e.g., Kochhar, 1996). Hence a change in the leverage ratio can affect a firm's financing capacity, risk, cost of capital, investment, and strategic decisions, and ultimately shareholder returns. According to agency theory, managers are incentivised by threat of bankruptcy to be prudent and go for strategies that will enhance shareholder value (e.g., Jensen, 1986). This is because lenders employ high powered incentives in debt contracts that obligate managers to a repayment schedule failing which the lenders can be repaid by forcing through bankruptcy (e.g., Jensen & Meckling, 1976). Hence, debt represents distress risk to a firm and has implications for riskiness of firm cashflows. However, the issue of impact in usage of debt between concentrated and less concentrated settings, is not clear.

Firms in more concentrated industries have greater leveraging capacity than firms in more fragmented industries and tend to adopt similar debt ratios (Freedman & Fulmer, 1982). This is because such firms may have greater market power and control hence, we expect relatively low earnings volatility compared to more competitive settings. Firms in more fragmented industries tend to be more leveraged than larger firms, to source debt less efficiently, and face greater scrutiny from the market because of their tenuous market positions and are probably less immune from other governance systems – the market for corporate control, competition etc. even though debt/lenders have a priority claim on the firm (Mackay & Phillips, 2005). Therefore, we can argue that fragmented industries with many such firms will tend to have more earnings volatility on average compared to concentrated industry structures with more established firms.

Finally, an exogenous negative economic shock which reduces overall industry demand will be a relatively low distress risk factor to firms in more concentrated than those in less concentrated product-markets. Firms that have greater debt capacity, will be penalised less than those with less by the market in crisis times. Uptake of debt which may be sourced cheaply in crisis times, is supportive of survival strategies that firms will need to weather the storm – but these strategies will be judged by the market to be more beneficial to larger companies in more concentrated sectors than smaller companies in less concentrated sectors.

Hence, in line with the above postulations:

H1. The positive impact of leverage on stock returns will be lower (penalized more by the market) in relatively more concentrated

[1] See Kraus and Litzenberger (1973); Myers (1984); Myers and Majluf (1984); Titman and Wessels (1988); Rajan and Zingales (1995); Booth, Aivazian, Demiguc-Kunt & Maksimovic, 2001; Lally, 2002; Fama and French (2002); Frank and Goyal (2003); Hovakimian, Hovakimian and Tehranian, 2004; Fama and French (2005); Flannery and Rangan (2006); Kale and Shahrur (2007); Jiraporn and Gleason (2007); Franck and Huyghebaert (2010); Dang (2011); Dhaliwal, Khurana and Pereira (2011); Jong de,Verbeek and Verwijmeren (2012).

industries settings than in less concentrated or more competitive industries irrespective of a crisis or not.

2.2. The impact of strategic other managerial expenditure decisions on firm value in different industry concentration settings

Strategic managerial expenditure decisions in firms depend on the industry concentration context of firms (Hou & Robinson, 2006). Consider, first, inventories management – spanning the firm's overall production cycle and management of working capital. Inventories refer to finished goods, work in progress and raw materials held by a firm for the purpose of ultimately selling to customers. The strategic purpose of inventory is that the firm does not run out of stock when customers make bulk orders. However, inventories also represent a cost to business: the cost of holding up cash and associated costs such as warehouse, insurance, etc. (holding costs). Firms in more concentrated industries have relatively greater capacity to hold inventory than those in more fragmented settings – but can use bargaining power from size effects and reputational effects (trust and track record) to incur lower average expenditures relative to sales than firms in more competitive settings (Porter, 1979; Porter, 1987). Any cost savings should be reflected in profits and thus abnormal returns which help those firms weather the negative economic impact of a recession or drop in demand. Hence, we argue that:

H2a. . The negative impact of inventory expenditure on stock returns will be lower in relatively more concentrated industries settings than in less concentrated or more competitive industries irrespective of a crisis or not.

Research and development (R&D) are pivotal to a firm's competitive advantage when characterized as valuable, rare, and inimitable and likely to be non-tradable (e.g., Barney, 1991). Firms build R&D capabilities through resource expenditures (Dierickx & Cool, 1989) to develop new knowledge that may be embodied into new and more valuable products or services for customers or process efficiencies to reduce costs.

R&D expenditures also provide the potential to introduce riskiness in a firm's cashflows – representing different opportunities to commercialize innovations (Hou & Robinson, 2006). Firms in more concentrated product-markets focus more on incremental than disruptive innovation (Hill & Rothaermel, 2003) because path dependency and absorptive capacity constrain further accumulation of radical knowledge in (Cohen & Levinthal, 1990). Firms in fragmented industries are less inhibited and can indulge in relatively more risky innovative activities, that either result in increased firm turnover or economic growth which then raises expected returns. In crisis times, the positive impact of R&D expenditures is accentuated in fragmented settings because of time-compression diseconomies and the market likely penalises R&D expenditures by firms in more concentrated product-markets.

Hence, in line with the above postulations:

H2b. . The positive impact of R&D on firm value will be less in relatively more concentrated industries settings than in less concentrated or more competitive industries and will be accentuated in a crisis.

The firm's overhead expense is affected by the firm's industry concentration context. For example, firms with a relatively large sales base can leverage mechanisms such as word of mouth to increase product awareness at a lower cost relative to smaller firms (Dierickx and Cool (1989). Similarly, in markets subject to positive network externalities, such as in video games, bandwagon effects influence sales acquisition costs to the advantage of larger firms in more concentrated industry settings (Katz & Shapiro, 1994). Lower expenditures result in abnormal profits which can cushion the firm in times of distress risk much more than could be done for smaller firms in fragmented industries (Peteraf,1993). Hence, we posit that:

H2c. The negative impact of a firm's expense structure on firm value will be less in relatively more concentrated industries settings than in less concentrated or more competitive industries and will be accentuated in a crisis.

Finally, new asset acquisitions (i.e., property, plant, and equipment additions) have a differential impact on stock returns depending on the competitive context of the firm (Wernerfelt, 1984; Rumelt, 1984). Firms in more concentrated product-markets likely have complementary resources that significantly increase efficiency of accumulation relative to firms in relatively more fragmented industries, (Dierickx & Cool, 1989). For example, large companies have R&D capabilities and manufacturing, marketing and distribution and can buy discounted assets from smaller companies in return for access to their complementary assets such as manufacturing, marketing and sales and regulatory capabilities. Thus, we expect the relative benefits of discounted expenditures to be reflected in abnormal profits which places the large firms in a good position to weather bad business conditions i.e., low expected returns.

H2d. The negative impact of a firm's asset addition on firm value will be less in relatively more concentrated industries settings than in less concentrated or more competitive industries and will be accentuated in a crisis.

3. Data and methods

The source of our data is Thomson Reuters DataStream. The initial sample consists of 2673 companies listed on the London Stock Exchange from 1980 to 2017. To be included in the sample, a firm must have available fiscal year-end leverage ratios and stock price series for at least the preceding 12 months. We exclude all financial companies, including banks, investment companies, insurance, and life assurances, as well as companies that have changed their fiscal period end date during the research period. This results in the removal of 1090 financial companies. Additionally, 408 companies are excluded due to the unavailability of stock prices for all subsequent years. We also exclude 100 companies with short quotation experience, 130 companies with a market value of less than £ 1

million, and 100 firms with negative market-to-book values.

The resulting unbalanced panel dataset consists of 1281 firms over the period 1980–2017, with a total of 19,132 firm-year observations. The average number of observations per firm is approximately 14 years. We group our sample firms into sectors using the four-digit Industry Classification Benchmark (ICB) industry classification.[2]

3.1. Measures[3]

3.1.1. Dependent variable

The dependent variable in this paper is stock returns and measures the change in market value of the firm. Stock returns for each firm is calculated monthly and by using percentage change in consecutive closing prices adjusted for dividends splits and rights issues (Fama et al., 1969). The stock returns are in excess of the risk-free rate represented by the one-month UK Treasury discount bill. The average returns calculated for each firm are over the 12 months from May 1st of the year giving a one-month gap after financial statement announcements on March 31st of each year to avoid including short term noise due to announcement effects.

3.1.2. Explanatory variables

3.1.2.1. Industry concentration. Industry concentration considers the product market properties in terms of its competition structures. We use three different measures to capture industry concentration: the Herfindahl-Hirschman Index (HHI), the Three-firm Concentration Ratio (CR3), and the Five-firm Concentration Ratio (CR5). These three measures provide a comprehensive view of industry concentration, with the HHI capturing the overall distribution of market shares and the concentration ratios focusing on the dominance of the largest firms in an industry.

Herfindahl-Hirschman Index (HHI): We use end-of-year balance sheet figures to estimate industry[4] concentration using the Herfindahl-Hirschman Index, defined as:

$$HHI_{jt} = \sum_{i=1}^{N} s_{ijt}^2 \tag{1}$$

where s_{ijt} is the market share of firm i in industry j at time t based on net sales, and N is the number of firms in industry j (Hou & Robinson, 2006; Giroud & Mueller, 2011). We calculate the HHI for each industry and then average the values over the past three years to ensure that the measure is not unduly influenced by potential data errors (Hou & Robinson, 2006).

Three-firm Concentration Ratio (CR3): The Three-firm Concentration Ratio represents the combined market share of the three largest firms in an industry (Curry & George, 1983; Scherer & Ross, 1990). It is calculated as follows:

$$CR3_{jt} = \sum_{i=1}^{3} s_{ijt} \tag{2}$$

where s_{ijt} is the market share of firm i in industry j at time t based on net sales, and the firms are ranked in descending order of market share.

Five-firm Concentration Ratio (CR5): The Five-firm Concentration Ratio represents the combined market share of the five largest firms in an industry (Curry & George, 1983; Scherer & Ross, 1990). It is calculated as follows:

$$CR5_{jt} = \sum_{i=1}^{5} s_{ijt} \tag{3}$$

where s_{ijt} is the market share of firm i in industry j at time t based on net sales, and the firms are ranked in descending order of market share.

3.1.2.2. Leverage. Leverage is the ratio of the book value of total debt to total equity. Schwartz (1959) argues that using book values in defining the capital structure encompasses the total of all liabilities and ownership claims. It also ensures that the effects of past financing are best represented (Rajan & Zingales, 1995). Graham and Harvey (2001) report that managers focus on book values when setting financial structures. The paper uses the capital leverage definition (DataStream code: WC08221) to represent the companies' leverage in the sample.

$$Leverage = \frac{Long - termdebt + Short - termdebt}{TotalEquity} \tag{4}$$

3.1.2.3. Inventory level. Inventory refers to the stock of goods that a firm has in its shops, warehouses, and logistic centres. It is important for firms to have an efficient stock management system in place, the inventory level is calculated as:

[2] Refer to Table A1 in the online appendix for industry classification according to Industry Classification Benchmark (ICB)

[3] See Table 1 for variables definitions.

[4] Industry is classified according to the Industry Classification Benchmark (ICB)

$$inventory\ level = \frac{inventory\ stock}{sales} \tag{5}$$

3.1.2.4. Research and development (R&D) intensity. R&D intensity represents all direct and indirect costs related to the creation and development of new processes, techniques, applications, and products with commercial possibilities. It is calculated as:

$$R\&DIntensity = \frac{ResearchandDevelopmentExpenses}{Sales} \tag{6}$$

R&D intensity is a crucial measure of a firm's innovation input and its commitment to generating new knowledge and technologies (Cohen & Levinthal, 1989; Griliches, 1979). Firms with higher R&D intensity are more likely to develop unique capabilities and achieve competitive advantages in the market (Lev & Sougiannis, 1996; Gu, 2016).

3.1.2.5. Selling, general and administration expenses (SGA). SGA represents expenses not directly attributable to the production process but relating to selling, general and administrative functions. It is also called non-production overheads.

$$SGA = \frac{Selling\ General\&Administration\ expenses(SG\&A)}{Sales} \tag{7}$$

3.1.2.6. Fixed assets additions. Fixed asset additions represent the funds used to acquire fixed assets other than those associated with acquisitions. It includes but is not restricted to additions to property, plant and equipment, Investments in machinery and equipment.

$$Fixed\ Assets\ Additions = \frac{Fixed\ Assets\&Additions}{Total\ Fixed\ Assets} \tag{8}$$

3.1.3. Control variables

We use the following variables to control for the known factors that have explanatory power on our dependent variable.

3.1.3.1. Size. The analysis uses the total assets of the firms to represent the firm size. In the finance literature, size is regarded as an important determinant of firm performance (Banz, 1981; Fama & French, 1992).

3.1.3.2. Growth opportunities. This study uses price-to-book ratio as a proxy for growth opportunities (Rosenberg, Reid & Lanstein, 1985; Chan, Hamao & Lakonishok, 1991). The market-to-book value refers to the share prices of companies divided by the net book value (Fama & French, 1992).

3.1.3.3. Risk. This study uses the market risk measure as the volatility measure. The market risk measure is the beta coefficient (β), which is estimated over a five-year period in a rolling window using monthly data (Blume, 1975).

3.2. Econometric model

3.2.1. Mixed linear models

We employ mixed linear models, also known as hierarchical linear models or multilevel models, to investigate the relationship between managerial expenditure decisions and stock returns across different industry concentrations. Mixed linear models are particularly suitable for our research questions because they allow for the inclusion of both fixed and random effects, which helps address potential endogeneity issues and accounts for the nested structure of our data (Raudenbush & Bryk, 2002; Snijders & Bosker, 2012).

Our data consist of three levels: years (level 1) nested within firms (level 2), which are nested within sectors (level 3). The mixed linear model can be expressed as follows:

$$returns_{ijkt} = \beta_0 + \beta_1 X_{ijkt} + \beta_2 Z_{jkt} + \beta_3 W_{kt} + \gamma_t + v_k + u_{jk} + \epsilon_{ijkt} \tag{9}$$

where $returns_{ijkt}$ is the stock return of firm j in sector k at year i, β_0 is the overall intercept, X_{ijkt} is a vector of explanatory market conditions variables (e.g., PTBV, risk and size), β_1 is a vector of coefficients for year-level variables, Z_{jkt} is a vector of firm-level managerial decision variables (leverage, inventory, R&D, selling general and administration expenses and fixed assets additions), β_2 is a vector of coefficients for firm-level variables, W_{kt} is a vector of sector-level variables (i.e. HHI, CR3 and CR5), β_3 is a vector of coefficients for sector-level variables, γ_t is the random effect for year, v_k is the random effect for sector k, u_{jk} is the random effect for firm j in sector k, and ϵ_{ijkt} is the error term.

The fixed effects part of the model, represented by β_0, β_1, β_2 and β_3, captures the overall relationship between managerial expenditure decisions, industry concentration, and stock returns, while accounting for year-level factors. The random effects part of the model, represented by γ_t, v_k and u_{jk}, captures the variability in stock returns across different sectors and firms within sectors, allowing for sector-specific and firm-specific intercepts.

Mixed linear models offer several advantages for our research question. First, they allow us to estimate the effects of time-varying year-level variables, firm-level variables (managerial expenditure decisions), and time-invariant sector-level variables (industry

concentration) on stock returns, which is crucial for understanding how the relationship between managerial expenditure decisions and stock returns varies across industry concentrations (Hox et al., 2017).

Second, mixed linear models help address potential endogeneity issues arising from unobserved heterogeneity at both the firm and sector levels (Gormley & Matsa, 2014). By including sector-level and firm-level random effects, we control for unobserved sector and firm characteristics that may affect both managerial expenditure decisions and stock returns, thus mitigating endogeneity concerns.

Third, mixed linear models account for the nested structure of our data, with years nested within firms, which are nested within sectors (Raudenbush & Bryk, 2002). This approach allows us to model the dependence among observations within the same firm and sector, providing more accurate estimates and standard errors.

3.2.2. Dynamic Panel Methods

To further address endogeneity concerns and check the robustness of our results, we also employ dynamic panel methods, such as the Arellano-Bond estimator (Arellano & Bond, 1991). These methods are designed to control for endogeneity arising from unobserved heterogeneity, simultaneity, and dynamic relationships between variables (Roodman, 2009).

The dynamic panel model can be expressed as follows:

$$returns_{it} = \alpha returns_{i,t-1} + \beta_1 X_{it} + \beta_2 Z_{jt} + \beta_3 W_{kt} + \eta_i + \lambda_t + \epsilon_{it} \tag{10}$$

where $returns_{it}$ is the stock return of firm i at time t, $returns_{i,t-1}$ is the lagged stock return, α is the coefficient for the lagged dependent variable, η_i is the firm-specific fixed effect, λ_t is the time-specific fixed and ϵ_{it} is the error term.

The Arellano-Bond estimator uses the generalized method of moments (GMM) to estimate the model, employing lagged levels of the dependent variable and explanatory variables as instruments for the first-differenced equation (Arellano & Bond, 1991). The Arellano-Bond estimator is a two-step procedure. In the first step, the error terms are assumed to be independent and homoscedastic across firms and over time. In the second step, the residuals from the first step are used to construct a consistent estimate of the variance-covariance matrix, allowing for heteroskedasticity and serial correlation (Roodman, 2009).

The Arellano-Bond estimator is particularly useful when the panel dataset has a large number of cross-sectional units (firms) and a relatively small number of time periods, as is common in corporate finance research (Flannery & Hankins, 2013). However, the estimator's performance may be affected by the choice of instruments and the presence of weak instruments (Kiviet, 2020). While dynamic panel methods can effectively address endogeneity concerns, they require a large number of time periods and can be sensitive to the choice of instruments and the presence of weak instruments (Kiviet, 2020). Therefore, we use dynamic panel methods as a robustness check to complement our main analysis based on mixed linear models.

Table 1
Variables Definitions.

Variable	Definition
Dependent Variable	
RTNS	Monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months.
Measures of Concentration	
HHI	Herfindahl Index, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years.
CR3	Three-firm Concentration Ratio, representing the combined market share of the three largest firms in an industry.
CR5	Five-firm Concentration Ratio, representing the combined market share of the five largest firms in an industry.
Market Measures	
RISK	Market risk, measured by the beta coefficient estimated over a five-year period using monthly data.
SIZE	Firm size, measured as the natural logarithm of total assets.
PTBV	Price-to-book ratio, used as a proxy for growth opportunities.
Managerial and Expenditure Decision Measures	
LEV	Leverage, calculated as the ratio of total debt to equity.
INVENTORY	Inventory level, calculated as the ratio of inventory to sales.
SGA	Expense structure, measured as the ratio of selling, general, and administrative expenses to sales.
R&D	Research and development intensity, calculated as the ratio of research and development expenses to sales.
FAA	Fixed asset additions, calculated as the ratio of new plant and equipment to total fixed assets
Alternative Proxies	
LEVp	Alternative measure of leverage. This measure is leverage defined as the ratio of total debt to total assets.
INVENTORYp	Natural logarithm of inventory.
SGAp	Natural logarithm of SGA.
R&Dp	Natural logarithm of R&D.
FAAp	Natural logarithm of FAA.

Notes: Stock returns are adjusted for dividends, splits, and rights issues (Fama et al., 1969). The Herfindahl Index ranges from 0 to 1, with higher values indicating greater industry concentration (Hou & Robinson, 2006). Concentration ratios are commonly used measures of industry concentration (Curry & George, 1983). The beta coefficient captures the sensitivity of a firm's stock returns to market movements (Sharpe, 1964). Firm size is an important determinant of firm performance (Banz, 1981; Fama & French, 1992). The price-to-book ratio is a widely used valuation metric and proxy for growth opportunities (Fama & French, 1992). Leverage is a key financing decision that can affect firm value and risk (Modigliani and Miller, 1958). Inventory level reflects a firm's working capital management and production cycle (Gaur et al., 2005). The expense structure captures the firm's overhead costs and operational efficiency (Banker et al., 2013). R&D intensity is a measure of a firm's investment in innovation and future growth (Cohen & Levinthal, 1989). Fixed asset additions represent a firm's capital expenditures and investment in productive capacity (Hayashi, 1982).

4. Empirical results

4.1. Descriptive statistics

We report key measures for all variables in Table 2, the correlation matrix in Table 3, and the Variance Inflation Factor (VIF) in Table 4. Table 2 includes the mean, median, standard deviation, minimum (Min), maximum (Max), and sample size (N) for an unbalanced panel dataset consisting of 1281 firms over the period 1980–2017, with a total of 19,132 firm-year observations. The average number of observations per firm is approximately 14 years.

According to Table 2, the average monthly stock return is −3.5 %, with a standard deviation of 3.5 %. The returns range between −17.3 % and 22.1 %, indicating a widespread in the distribution of stock returns. The Herfindahl index (HHI) has a mean of 0.133 and a median of 0.141, suggesting that most firms operate in relatively competitive industries. The Three-firm Concentration Ratio (CR3) and Five-firm Concentration Ratio (CR5) have means of 0.047 and 0.073, respectively, further confirming the competitive nature of the industries in the sample.

The control variables also show considerable variation. The average firm size, measured by total assets, is 11.443 (logged values), with a standard deviation of 2.378. The price-to-book ratio (PTBV) has a mean of 104.232, but with a large standard deviation of 8670.336, indicating the presence of extreme values. Leverage, measured as the ratio of total debt to total financing, has a mean of 70.094 and a standard deviation of 3938.438, also suggesting the presence of outliers.

The key managerial decision variables, namely Inventory, SGA, R&D, and FAA, exhibit substantial variation as well. For example, the mean inventory is 102,425.13, with a standard deviation of 913,627.57, while the mean R&D expense is 35,941.833, with a standard deviation of 240,091.48. These large standard deviations indicate that there are significant differences in these variables across firms and years.

It is important to note that the sample sizes for some variables may not match due to missing values. For example, the sample size for Risk is 12,656, while the sample size for R&D is 6441. This discrepancy is due to data availability and reporting differences across firms and years.

Table 3 presents the pairwise correlations among the variables used in the analysis. The correlations provide a preliminary assessment of the relationships between the variables. The correlation coefficients are generally low, indicating weak linear relationships among the variables. However, there are some notable exceptions. For example, the correlation between CR3 and CR5 is 0.855, suggesting a strong positive relationship between these two concentration measures. Additionally, SGA and R&D have a correlation of 0.745, indicating a strong positive association between these two variables.

Table 4 presents the results of the multicollinearity diagnostics. The Variance Inflation Factor (VIF) and its square root (SQRT VIF) are measures of the degree to which the variance of an estimated regression coefficient is increased due to collinearity. A VIF value greater than 10 or a SQRT VIF greater than 2 indicates potential multicollinearity issues. Tolerance is the reciprocal of VIF and represents the proportion of a variable's variance not accounted for by other independent variables in the model. A tolerance value below 0.1 suggests potential multicollinearity.

The R-squared is obtained by regressing each independent variable on all other independent variables in the model. A high R-squared value (close to 1) indicates that a large portion of the variable's variance is explained by other independent variables,

Table 2
Key Descriptive Statistics. This table reports the summary statistics for an unbalanced panel dataset consisting of 1281 firms over the period 1980–2017, with a total of 19,132 firm-year observations (N). The average number of observations per firm (T bar) is approximately 14 years. Stock returns (Returns) are monthly stock returns in excess of the risk-free rate, averaged over a 12-month period. The Herfindahl Index (HHI) is a measure of industry concentration, calculated as the sum of squared sales-based market shares of all listed firms in an industry, averaged over the past three years. Low concentration firms range from 0–1800, and high concentration firms range from 1800–10000. The Three-firm Concentration Ratio (CR3) and Five-firm Concentration Ratio (CR5) represent the combined market share of the three and five largest firms in an industry, respectively. Risk is the beta coefficient estimated over five years using monthly data. Size is the total assets of the firms. Price-to-book ratio (PTBV) is the price divided by its net book value. Leverage is the ratio of total debt to total financing. Inventory, SGA (Selling, General, and administrative expenses), R&D (Research and Development expenses), and FAA (Fixed Asset Additions) are presented in their original values. It is important to note that the sample sizes for some variables may not match due to missing values. For example, the sample size for Risk is 12,656, while the sample size for R&D is 6441. This discrepancy is due to data availability and reporting differences across firms and years.

Variables	Mean	Std. Dev.	Min	Max	N
Returns	-.035	.035	-.173	.221	19132
HHI	.133	.141	.006	1	19132
CR3	.047	.124	0	1	19132
CR5	.073	.157	0	1	19132
Risk	.746	5.28	-565.65	62.88	12656
Size	11.443	2.378	.693	19.746	19061
PTBV	104.232	8670.336	-27949.9	1125000	17574
Leverage	70.094	3938.438	-76200	513966.67	18428
Inventory	102425.13	913627.57	0	30097680	16688
SGA	206113.87	990269.18	-7000	15037250	15068
R&D	35941.833	240091.48	0	4212827	6441
FAA	100652.98	891003.21	-6772	30185026	16681

Table 3
Pairwise Correlation Matrix. This table presents the pairwise correlations among the variables used in the analysis. The correlations provide a preliminary assessment of the relationships between the variables.

	Returns	HHI	CR3	CR5	Risk	Size	PTBV	Leverage	Inventory	SGA	R&D	FAA
Returns	1.000											
HHI	-0.097	1.000										
CR3	-0.241	0.401	1.000									
CR5	-0.273	0.447	0.855	1.000								
Risk	-0.002	-0.001	0.004	0.000	1.000							
Size	0.002	0.031	0.101	0.092	0.036	1.000						
PTBV	0.010	-0.005	-0.004	-0.004	-0.003	-0.008	1.000					
Leverage	0.005	-0.003	-0.003	-0.001	0.007	0.002	-0.001	1.000				
Inventory	0.036	0.074	0.001	-0.002	-0.006	0.273	-0.001	0.000	1.000			
SGA	0.026	0.123	0.048	0.053	0.004	0.448	-0.003	0.000	0.614	1.000		
R&D	0.028	0.131	0.002	0.021	0.003	0.300	-0.008	0.013	0.360	0.745	1.000	
FAA	0.027	0.156	0.048	0.043	0.002	0.317	-0.001	0.001	0.807	0.707	0.228	1.000

Table 4
Multicollinearity Diagnostics. This table presents the results of the multicollinearity diagnostics. The Variance Inflation Factor (VIF) and its square root (SQRT VIF) are measures of the degree to which the variance of an estimated regression coefficient is increased due to collinearity. A VIF value greater than 10 or a SQRT VIF greater than 2 indicates potential multicollinearity issues. Tolerance is the reciprocal of VIF and represents the proportion of a variable's variance not accounted for by other independent variables in the model. A tolerance value below 0.1 suggests potential multicollinearity. The R-squared is obtained by regressing each independent variable on all other independent variables in the model. A high Squared value (close to 1) indicates that a large portion of the variable's variance is explained by other independent variables, suggesting potential multicollinearity. SGA and R&D show potential multicollinearity issues, with VIF values greater than 10 and SQRT VIF values greater than 2. FAA also has a relatively high VIF value (6.17) and a low tolerance (0.162), indicating potential multicollinearity. The Squared values for SGA, R&D, and FAA are also high (0.9293, 0.8843, and 0.838, respectively), further suggesting potential multicollinearity among these variables.

Variable	VIF	*SQRT* VIF	Tolerance	R- Squared
HHI	1.26	1.12	0.7938	0.2062
CR3	2.43	1.56	0.4117	0.5883
CR5	2.68	1.64	0.3736	0.6264
Risk	1.01	1.01	0.9874	0.0126
Size	1.56	1.25	0.6405	0.3595
PTBV	1	1	0.9992	0.0008
Leverage	1	1	0.9986	0.0014
Inventory	2.16	1.47	0.462	0.538
SGA	14.15	3.76	0.0707	0.9293
R&D	8.64	2.94	0.1157	0.8843
FAA	6.17	2.48	0.162	0.838

suggesting potential multicollinearity.

SGA and R&D show potential multicollinearity issues, with VIF values greater than 10 and SQRT VIF values greater than 2. FAA also has a relatively high VIF value (6.17) and a low tolerance (0.162), indicating potential multicollinearity. The R-squared values for SGA, R&D, and FAA are also high (0.9293, 0.8843, and 0.838, respectively), further suggesting potential multicollinearity among these variables. These results suggest that caution should be exercised when interpreting the coefficients of these variables in the regression analysis, as their individual effects may be difficult to separate due to their high correlations.

4.2. Estimation results

The estimation results based on the mixed linear model, as specified in Eq. 9, are reported in the main text, while the estimation output for the dynamic panel data is presented in the online appendix. Table 5 presents the coefficient estimates from the baseline model using mixed linear models. Column (1) focuses on the impact of industry concentration measures (HHI) on stock returns without controlling for firm-specific characteristics, while column (2) includes firm size, growth opportunities, and market risk as control variables.

The results show that industry concentration, as measured by the Herfindahl Index (HHI), has a significant negative impact on stock returns across all specifications. This finding supports the argument that firms in more concentrated industries face lower distress risk and, therefore, earn lower expected stock returns (Hou & Robinson, 2006). The magnitude of the coefficient estimates for HHI ranges from −0.27929 to −0.21591, indicating that a one-unit increase in HHI leads to a decrease in monthly stock returns of approximately 0.22 to 0.28 % points. The dynamic panel GMM estimation results, reported in Table A3 of the online appendix, are largely consistent with those obtained from the mixed linear models. Industry concentration (HHI) has a significant negative impact on stock returns, but the estimated coefficients are much smaller than those reported by the mixed linear model. The lagged returns variable is highly significant across all specifications, indicating the persistence of stock returns over time.

Table 5
Baseline Model (Linear Mixed Effects Model). The table presents two model specifications, with column (1) focusing on the impact of industry concentration measure (HHI) on stock returns without using control variables, while column (2) includes control variables such as firm size, growth opportunities, and market risk as additional explanatory variables. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Intercept represents the average stock returns when all explanatory variables are zero. Control variables include Size (the natural logarithm of total assets), PTBV (the price-to-book ratio), and Risk (the market risk, measured by the beta coefficient estimated over a five-year period using monthly data). The model allows for random coefficients at the sector, firm, and year levels to account for unobserved heterogeneity. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are used to account for potential heteroskedasticity and clustering of observations within firms. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. The full table, including the random coefficients and control variables, is reported in the online appendix, Table A2.

	(1)	(1)
HHI	-.27929 * **	-.21591 * **
Intercept	.04106 * *	-.04085 * *
Observations	19022	12003
Wald Statistics	4743.6 * **	3777.4 * **
LR Statistics	6719.3 * **	4215.4 * **
Control Variables	No	Yes
Firms Effect	Yes	Yes
Year Effect	Yes	Yes
Sector Effect	Yes	Yes

Hypothesis 1. predicts a positive relationship between leverage and stock returns, with the impact being lower in more concentrated industries. Table 6 presents the results for the extended model, which includes firm-specific variables and their interactions with industry concentration.

In Table 6, the coefficient estimate for leverage is positive but not statistically significant (Column 1 and Column 7). However, the interaction term between leverage and HHI is negative, albeit not statistically significant. These results provide partial support for Hypothesis 1, suggesting that the positive impact of leverage on stock returns may be lower in more concentrated industries.

Hypothesis 2a. predicts a negative relationship between inventories and stock returns, with the impact being lower in more concentrated industries. The coefficient estimate for inventory is positive but not statistically significant (Column 2 and Column 7). The interaction term between inventory and HHI is negative and significant in Column 2, providing support for Hypothesis 2a.

Hypothesis 2b. predicts a positive impact of R&D on firm value, with the impact being lower in more concentrated industries. The coefficient estimate for R&D is negative but not statistically significant (Column 3 and Column 7). The interaction term between R&D and HHI is positive but not significant. These results do not provide strong support for Hypothesis 2b.

Hypothesis 2c. predicts a negative impact of the expense structure (SGA) on firm value, with the impact being lower in more concentrated industries. The coefficient estimate for SGA is negative and significant in Column 5, supporting the hypothesis. However, the interaction term between SGA and HHI is positive and significant, contrary to the prediction.

Hypothesis 2d. predicts a negative impact of fixed asset additions on stock returns, with the impact being lower in more concentrated industries. The coefficient estimate for fixed assets is positive but not significant (Column 4 and Column 7). The interaction term between fixed assets and HHI is negative but not significant. These results provide weak support for Hypothesis 2d.

The findings based on the dynamic panel GMM, reported in the online appendix (Table A5), are generally consistent with those from the mixed linear models. The lagged returns variable remains highly significant across all specifications, confirming the persistence of stock returns. Industry concentration (HHI) has a significant negative impact on stock returns in most specifications.

The coefficient estimates for leverage, inventory, R&D, fixed assets, and SGA are mostly not statistically significant in the dynamic panel GMM results. The interaction terms between these variables and HHI provide mixed evidence for the hypotheses. The interaction between inventory and HHI is negative and significant in Column 2, supporting Hypothesis 2a. The interaction between R&D and HHI is positive and significant in Column 7, contrary to Hypothesis 2b.

To investigate the potential non-linearity of the effects, we split our sample into two subperiods: the crisis period (2008–2010) and the non-crisis period (pre-2008 and post-2010). The results for the non-crisis period are reported in Table 7, while Table 8 focuses on

Table 6
HHI Extended Model (Mixed Effects Linear Model). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Control variables include Size (the natural logarithm of total assets), PTBV (the price-to-book ratio), and Risk (the market risk, measured by the beta coefficient estimated over a five-year period using monthly data). The model allows for random coefficients at the sector, firm, and year levels to account for unobserved heterogeneity. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are used to account for potential heteroskedasticity and clustering of observations within firms. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The full table, including the random coefficients and control variables, is reported in the online appendix, Table A3.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.21527 * **	-.2117 * **	-.17449 * **	-.21986 * **	-.2116 * **	-.16828 * **	-.16799 * **
Leverage	.00062					-.01036 *	-.00609
HHI × Leverage	-.0073						-.0348
Inventory		.00605				.00453	.01083
HHI × Inventory		-.0363 *					-.03182
R&D			-.00002			-.00015	-.00034
HHI × R&D			.00002				.00078
Fixed Assets				.00332		.00432	.00925
HHI × Fixed Assets				-.00873			-.02004
SGA					-.00337 * **	-.004	-.01107
HHI × SGA					.01211 * **		.02942
Intercept	-.04217 * *	-.04193 * *	-.03461 *	-.02649	-.0454 * *	-.03439	-.03342
Observations	11843	11788	4140	9777	11677	3441	3441
Wald Statistics	3734.0 * **	3750.5 * **	1357.7 * **	2834.8 * **	3738.9 * **	1086.7 * **	1087.3 * **
LR Statistics	4143.7 * **	4071 * **	1453 * **	3541.8 * **	4036.1 * **	1269.4 * **	1245.3 * **
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

the crisis period. The corresponding dynamic panel GMM results are presented in Tables A11 and A17 of the online appendix.

During the non-crisis period, the impact of industry concentration on stock returns remains negative and significant, consistent with our main findings. The coefficient estimate for HHI ranges from −0.20663 to −0.16151 (Table 7). The interaction term between leverage and HHI is negative and significant in Column 1, providing support for Hypothesis 1. The interaction term between SGA and HHI is positive and significant in Column 5, contrary to Hypothesis 2c. The dynamic panel GMM results for the non-crisis period (Table A11) show a significant negative impact of HHI on stock returns, with coefficients ranging from −0.00625 to −0.0027.

During the crisis period, the direct impact of industry concentration on stock returns is less significant, with smaller coefficient estimates for HHI ranging from −0.0078 to −0.00308 (Table 8). However, the interaction terms between concentration measures and firm-specific variables become more prominent. The interaction between leverage and HHI is positive and significant in Column 1, contrary to Hypothesis 1. The interaction between R&D and HHI is negative and significant in Column 7, supporting Hypothesis 2b. The dynamic panel GMM results for the crisis period (Table A17) show a significant negative impact of HHI on stock returns in some specifications, with coefficients ranging from −0.0021 to −0.00173.

These findings highlight the importance of considering the potential non-linearity of the effects and the role of macroeconomic conditions in shaping the relationship between industry concentration, firm-specific factors, and stock returns. The results suggest that the impact of firm-specific variables on stock returns may vary depending on the level of industry concentration and the prevailing economic conditions.

In summary, the estimation results provide strong evidence for the negative impact of industry concentration on stock returns, consistent with the findings of Hou and Robinson (2006). The results also provide some support for Hypothesis 1 and Hypothesis 2a, suggesting that the impact of leverage and inventory on stock returns may be lower in more concentrated industries. However, the evidence for Hypotheses 2b, 2c, and 2d is mixed or weak. The analysis of crisis and non-crisis periods reveals potential non-linearities in the effects of industry concentration and firm-specific factors on stock returns, emphasizing the role of macroeconomic conditions in shaping these relationships.

Table 7
HHI Extended Model (Mixed Effects Linear Model) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Control variables include Size (the natural logarithm of total assets), PTBV (the price-to-book ratio), and Risk (the market risk, measured by the beta coefficient estimated over a five-year period using monthly data). The model allows for random coefficients at the sector, firm, and year levels to account for unobserved heterogeneity. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are used to account for potential heteroskedasticity and clustering of observations within firms. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The full table, including the random coefficients and control variables, is reported in the online appendix, Table A10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.20663 * **	-.20324 * **	-.16617 * **	-.21284 * **	-.20189 * **	-.16165 * **	-.16151 * **
Leverage	.00104 * *					-.01448	-.01451
HHI × Leverage	-.01399 *						-.00074
Inventory		.00616				.00641	.01156
HHI × Inventory		-.038					-.02418
R&D			-.00001			-.00016	-.00032
HHI × R&D			-.00004				.00066
Fixed Assets				.00357		.0044	.00892
HHI × Fixed Assets				-.00952			-.01849
SGA					-.00321 * **	-.00512	-.01273
HHI × SGA					.01063 * *		.02938
Intercept	-.05461 * **	-.05428 * **	-.04885 * *	-.03661 *	-.0592 * **	-.04694 * *	-.04612 * *
Observations	9814	9775	3377	8049	9664	2793	2793
Wald Statistics	3603.2 * **	3632.1 * **	1335.7 * **	2739.5 * **	3638.6 * **	1085 * **	1084.5 * **
LR Statistics	3990.8 * **	3927.1 * **	1410.5 * **	3428 * **	3894.8 * **	1249.5 * **	1228.6 * **
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.3. Robustness analysis

In this section, we discuss the results obtained from a series of robustness checks, which are reported in the online appendix. These checks include employing alternative measures of industry concentration – including investigating potential non-linearity of effects during crisis and non-crisis periods – and using alternative proxies for key explanatory variables.

First, we employ the Three-firm Concentration Ratio (CR3) and the Five-firm Concentration Ratio (CR5) as alternative measures of industry concentration. The mixed linear model results, presented in Tables A2, A6 and A8 in the online appendix, are largely consistent with our main analysis using the Herfindahl Index (HHI). Industry concentration, as measured by CR3 and CR5, has a significant negative impact on stock returns across most model specifications. The interaction terms between CR3/CR5 and firm-specific variables provide insights into how industry concentration moderates the relationship between these factors and stock returns. The consistency of the results across different concentration measures strengthens the robustness of our findings and suggests that the choice of concentration measure does not substantially alter the main conclusions of the study.

Furthermore, the dynamic panel GMM results using CR3 and CR5 as concentration measures, reported in Tables A3, A7 and A9 are also in line with our main findings. The lagged returns variable remains highly significant, confirming the persistence of stock returns, while industry concentration has a significant negative impact on stock returns in most specifications. The interaction terms between CR3/CR5 and firm-specific variables provide mixed evidence for the hypotheses, similar to the results obtained using HHI.

We investigate the potential non-linearity of the effects by splitting our sample into two subperiods: the crisis period (2008–2010) and the non-crisis period (pre-2008 and post-2010). The mixed linear model results for the non-crisis period using CR3 and CR5 are reported in Tables A12 and A14, while Tables A18 and A20 focus on the crisis period. The corresponding dynamic panel GMM results for the non-crisis period are presented in Tables A13 and A15, and for the crisis period in Tables A19 and A21.

During the non-crisis period, the impact of industry concentration on stock returns remains negative and significant, consistent with our main findings. The interaction terms between CR3/CR5 and firm-specific variables provide insights similar to those obtained using HHI. The dynamic panel GMM results for the non-crisis period also show a significant negative impact of CR3 and CR5 on stock returns.

Table 8
HHI Extended Model (Mixed Effects Linear Model) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Control variables include Size (the natural logarithm of total assets), PTBV (the price-to-book ratio), and Risk (the market risk, measured by the beta coefficient estimated over a five-year period using monthly data). The model allows for random coefficients at the sector, firm, and year levels to account for unobserved heterogeneity. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are used to account for potential heteroskedasticity and clustering of observations within firms. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The full table, including the random coefficients and control variables, is reported in the online appendix, Table A18.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.00308 * *	-.00319 * *	-.00522 * *	-.00349 * *	-.00313 * *	-.0078 * **	-.00516 * *
Leverage	-.0091 * **					-.00991 * **	.06147 * **
HHI × Leverage	.04117 * *						-.64506 * **
Inventory		-.00161				-.00471 *	-.00298
HHI × Inventory		.00952					-.048
R&D			.00002			.00009	.00072 * *
HHI × R&D			-.00006				-.00188
Fixed Assets				-.00001		-.00224	-.00625
HHI × Fixed Assets				.00029			.02409
SGA					.00027	.00461	.01665
HHI × SGA					.0008		-.04344
Intercept	-.01871 * **	-.01876 * **	-.01761 * **	-.01839 * **	-.01839 * **	-.01653 * **	-.01622 * **
Observations	2029	2013	763	1728	2013	648	648
Wald Statistics	164 * **	236.4 * **	44 * **	67.6 * **	220.6 * **	.* **	.* **
LR Statistics	0	0	0	0	0	0	0
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

In contrast, during the crisis period, the direct impact of industry concentration on stock returns is less significant, while the interaction terms between CR3/CR5 and firm-specific variables become more prominent. These findings highlight the importance of considering the potential non-linearity of the effects and the role of macroeconomic conditions in shaping the relationship between industry concentration, firm-specific factors, and stock returns.

Finally, we employ alternative measures and proxies for R&D, SGA, inventory, and fixed assets. Specifically, we use the natural logarithm of these variables in our robustness analyses. Additionally, we employ an alternative proxy for leverage, Leverage(DA), which is defined as the ratio of total debt to total assets (Welch, 2011; Fama & French, 2002).

The natural logarithm of R&D expenditures captures the possible diminishing returns to scale and non-linear effects of R&D on firm outcomes (Yeh et al., 2010; Chen and Ibhagui, 2019). This specification helps mitigate the influence of extreme values and is consistent with the concept of absorptive capacity, which suggests that a firm's ability to benefit from new knowledge depends on its prior related knowledge (Cohen & Levinthal, 1990). The logarithmic transformation reflects the idea that marginal returns to R&D investment may decrease as the absolute level of R&D increases, due to the challenges of managing larger innovation projects (Hsu, 2009).

Similarly, the natural logarithm of SG&A expenses accounts for potential non-linearities in the relationship between these expenses and firm performance. The logarithmic transformation recognises that the impact of SG&A on firm outcomes may vary depending on the scale of these expenditures (Lev and Radhakrishnan, 2005; Banker et al., 2014).

Inventory levels and fixed assets are also transformed using the natural logarithm to address possible non-linear relationships with firm performance. The logarithmic form of inventory captures the idea that the marginal benefits of holding additional inventory may diminish as inventory levels increase, due to factors such as storage costs and obsolescence risk (Gaur et al., 2005; Steinker et al., 2017). Similarly, the natural logarithm of fixed assets accounts for the potential diminishing returns to scale in the relationship between capital investment and firm performance (Anagnostopoulou, 2008).

Furthermore, we employ an alternative proxy for leverage, Leverage(DA), which is defined as the ratio of total debt to total assets (Welch, 2011; Fama & French, 2002). This measure captures the proportion of a firm's assets that are financed by debt. The formula for Leverage(DA) is as follows:

$$Leverage(DA) = \frac{Long - termdebt + Short - termdeb}{TotalAssets} \tag{11}$$

Finally, we employ alternative specifications for R&D, SGA, inventory, and fixed assets, using their natural logarithms to capture possible non-linear effects and address the influence of extreme values. Additionally, we use an alternative proxy for leverage, Leverage(DA), defined as the ratio of total debt to total assets. The results using these alternative proxies and CR3 and CR5 as concentration measures are presented in Tables A24 to A27 in the online appendix.

The mixed linear model results using alternative proxies (Table A22) show that industry concentration (HHI) has a negative and significant impact on stock returns across all model specifications. The interaction terms between HHI and the alternative proxies for leverage, inventory, R&D, and fixed assets provide insights consistent with our main findings. The dynamic panel GMM results using alternative proxies (Table A23) also confirm the robustness of our main conclusions.

The mixed linear model results using alternative proxies and CR3 as the concentration measure (Table A24) show that CR3 has a negative and significant impact on stock returns across all model specifications. The interaction terms between CR3 and the alternative proxies for leverage, inventory, R&D, and fixed assets provide insights consistent with our main findings. The dynamic panel GMM results using alternative proxies and CR3 (Table A25) also confirm the robustness of our main conclusions. Similarly, the mixed linear model results using alternative proxies and CR5 as the concentration measure (Table A26) and the corresponding dynamic panel GMM results (Table A27) are in line with our main findings, further strengthening the robustness of our conclusions.

In summary, our robustness analysis, detailed in the online appendix, confirms the main findings of the study and provides additional insights into the complexity of the relationship between industry concentration, firm-specific factors, and stock returns. The use of alternative concentration measures, the consideration of non-linearity of effects during different macroeconomic conditions, and the employment of alternative proxies for key variables collectively strengthen the reliability and generalizability of our results. These findings have important implications for managers, investors, and policymakers in understanding the interplay between industry structure, firm characteristics, and stock market performance.

5. Discussions and conclusion

Our paper was premised on how industry concentration influences the impact of key managerial expenditure decisions on stock returns. Our results indicate that industry concentration is an important contextual factor, aligning with both deterministic and less deterministic theories about how firms create value in different competitive settings. Firms in more concentrated industries are often shielded from risky movements in cash flows due to their ability to earn abnormal profits in good times, which buffer them in bad times. Conversely, firms in more fragmented or competitive settings may experience greater innovation-induced variability in industry competitiveness and company cash flows, increasing the likelihood of achieving abnormal stock returns (Hou & Robinson, 2006).

The baseline argument tested in this study is that key managerial expenditure decisions impact stock returns differently depending on the industry concentration. Specifically, we examined the impact of leverage, inventory turnover, R&D intensity, SGA, and fixed asset additions on stock returns across different industry concentrations.

Regarding leverage, we found support for our hypothesis that the positive impact of leverage on stock returns is lower in more concentrated industries than in more fragmented sectors. This finding aligns with the agency theory perspective, which suggests that managers use debt wisely due to the threat of bankruptcy and make prudent investments and strategies to sustain shareholder value. However, managers in larger firms within concentrated sectors are relatively more constrained by their context. Despite having more debt capacity, they are less likely to leverage their position compared to smaller firms in more fragmented sectors with less predictable earnings volatility. This could be because managers in large companies are better shielded from debt distress than those in smaller firms or more competitive settings, giving them less incentive to react to negative exogenous market pressures. During a global crisis, firms in more concentrated sectors can be better protected from debt distress costs than those in less concentrated sectors, possibly due to accumulated retained profits from enjoying relatively cheaper debt in the past.

Our study also examined inventory turnover, a key managerial decision with implications for customer service and cost efficiency. As predicted, inventory expenditures have an adverse impact on stock returns in general, but less so in more concentrated sectors relative to more competitive ones. The market recognizes that increases in inventory expenditure introduce relatively more cash flow volatility in fragmented sectors than in concentrated ones. Large firms in concentrated sectors can use their power and market influence to reduce earnings volatility from inventory expenditures more effectively than smaller firms in competitive sectors. This effect holds true in both non-crisis and crisis situations.

Regarding R&D intensity, we hypothesized that innovation introduces earnings volatility in a firm's cash flows, leading to a positive impact on firm value. However, we also postulate that this positive impact would be lower for larger firms in more concentrated sectors than for smaller firms in more fragmented sectors. Larger firms are more likely to focus on incremental or sustaining innovations (lower volatility), while smaller firms are more likely to engage in disruptive innovations. We found partial support for this hypothesis, particularly in the crisis sample results, possibly because the market places more weight on the importance of innovation during crises.

Lastly, our predictions on SGA and fixed asset additions were based on agency postulations that managers could keep these under control better in more concentrated sectors than in less concentrated sectors due to market discipline fears. However, these postulations were not fully supported by our results, suggesting that these two areas of resource allocation do not seem to provide cash flow volatility differences across sectors that the markets recognize.

By examining key managerial expenditure decisions that reflect strategic interactions between firms in different industry

concentrations, we can explain how those decisions are shaped by both deterministic and less deterministic theories linking context, strategic conduct, and performance. Deterministic approaches best explain why firms in concentrated sectors can use strategic expenditures such as leverage and inventories to their advantage over crisis and non-crisis periods to increase value. Less deterministic approaches better explain competitive interactions (e.g., induced by innovation) in more fragmented settings, where firms allocate resources in ways that deviate from industry averages, causing earnings volatility.

5.1. Managerial implications

Managers do have to be mindful of the competitive context when making financial and operational expenditure decisions. Those in fragmented sectors have less flexibility when it comes to key expenditure decisions on inventory and leverage, and this flexibility is further reduced when an exogenous force such as a crisis affects the sector.

Managers should also prioritize their attention according to the decisions most likely to significantly affect firm value. While managers should focus more on leverage, inventories, and R&D decisions, there is less evidence to support prioritizing SGA and fixed asset additions in either product-market structure, regardless of whether it is a crisis period or not.

In conclusion, our study highlights the importance of considering industry concentration when assessing the impact of managerial expenditure decisions on stock returns. By understanding how the competitive context shapes the relationship between these decisions and firm value, managers can make more informed choices and prioritize their efforts to maximize shareholder returns.

CRediT authorship contribution statement

Gulnur Muradoglu: Conceptualization, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **Dzidziso Samuel Kamuriwo:** Conceptualization, Investigation, Supervision, Validation, Writing – original draft, Writing – review & editing. **Issam Malki:** Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Sheeja Sivaprasad:** Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Appendix A

Table A1
Industry Classification Benchmark.

Code	Industry	Sector
1	Oil and Gas	Oil & Gas Producers
		Oil Equipment & Services
1000	Basic Materials	Chemicals
		Forestry & Paper
		Industrial Metals
		Mining
2000	Industrials	Construction & Materials
		Aerospace & Defence
		General Industries
		Electronic & Electric Equipment
		Industrial Engineering
		Industrial Transportation
		Support Services
3000	Consumer Goods	Automobiles & Parts
		Beverages
		Food Producers
		Household Goods
		Leisure Goods
		Personal Goods
4000	Healthcare	Healthcare Equipment & Services
		Pharmaceuticals & Biotechnology
5000	Consumer Services	Food & Drug Retailers
		General Retailers
		Media
		Travel and Leisure
6000	Telecommunications	Fixed Line Telecommunications
		Mobile Telecommunications
7000	Utilities	Electricity
		Gas, Water & Multi utilities
8000	Financials	Banks, Financial Companies, Insurance Firms, Pension Funds
9000	Technology	Software & Computer Services
		Technology Hardware & Equipment

Table A2

Baseline Model (Linear Mixed Effects Model). The table presents six model specifications, with columns (1) to (3) focusing on the impact of industry concentration measures (HHI, CR3, and CR5) on stock returns without controlling for firm-specific characteristics, while columns (4) to (6) include firm size, growth opportunities, and market risk as additional explanatory variables. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. CR3 and CR5 are the three-firm and five-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. PTBV is the price-to-book ratio, used as a proxy for growth opportunities. Risk is the market risk, measured by the beta coefficient estimated over a five-year period using monthly data. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Fixed Effect Part						
HHI	-.27929 * **			-.21591 * **		
	(.09366)			(.07282)		
CR3		-.07462 * **			-.04099 * **	
		(.01676)			(.0104)	
CR5			-.07228 * **			-.03994 * **
			(.01741)			(.01163)
Size				.00629 * **	.00872 * **	.00853 * **
				(.00098)	(.00118)	(.0012)
PTBV				.00036 * **	.00041 * **	.0004 * **
				(.00001)	(.00002)	(.00002)
Risk				-.00048	-.00052	-.00054
				(.00036)	(.00041)	(.00044)
Intercept	.04106 * *	-.0184 * **	-.01552 * **	-.04085 * *	-.11331 * **	-.11008 * **
	(.0199)	(.00248)	(.00303)	(.01921)	(.0134)	(.0135)
Random Coefficients						
Sector	-3.046 * **	-4.752 * **	-4.549 * **	-3.387 * **	-5.331 * **	-5.249 * **
Firms	-4.42 * **	-4.284 * **	-4.321 * **	-4.096 * **	-3.832 * **	-3.855 * **
Years	-3.638 * **	-3.559 * **	-3.573 * **	-3.86 * **	-3.819 * **	-3.822 * **
Residuals	-4.558 * **	-4.497 * **	-4.511	-4.81 * **	-4.719 * **	-4.733 * **
Observations	19022	19022	19022	12003	12003	12003
Wald Statistics	4743.6 * **	1270.1 * **	1873 * **	3777.4 * **	2189.7 * **	2338.7 * **
LR Statistics	6719.3 * **	2804 * **	3020.7 * **	4215.4 * **	2348.9 * **	2387.8 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes

Table A3

Baseline Model (Dynamic GMM, Arellano Bond Estimator). The table presents six model specifications, with columns (1) to (3) focusing on the impact of industry concentration measures (HHI, CR3, and CR5) on stock returns without controlling for firm-specific characteristics, while columns (4) to (6) include firm size, growth opportunities, and market risk as additional explanatory variables. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. CR3 and CR5 are the three-firm and five-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. PTBV is the price-to-book ratio, used as a proxy for growth opportunities. Risk is the market risk, measured by the beta coefficient estimated over a five-year period using monthly data. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged returns	.87224 * **	.86959 * **	.86682 * **	.83203 * **	.8286 * **	.82498 * **
	(.00379)	(.00394)	(.00398)	(.00487)	(.00476)	(.00489)
HHI	-.00301 * **			-.00333 * **		

(*continued on next page*)

Table A3 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
	(.00107)			(.00122)		
CR3		-.00416 * **			-.00508 * **	
		(.00136)			(.00166)	
CR5			-.00483 * **			-.00619 * **
			(.00107)			(.00121)
Size				.00008	.0001	.00012
				(.00007)	(.00007)	(.00007)
PTBV				-.00001	-.00001	-.00001
				(.00002)	(.00002)	(.00002)
Risk				.00016	.00015	.00014
				(.00013)	(.00013)	(.00013)
Intercept	-.00113 * **	-.00142 * **	-.00136 * **	-.00234 * **	-.00289 * **	-.00294 * **
	(.00017)	(.00013)	(.00014)	(.00089)	(.00088)	(.00086)
Observations	17793	17793	17793	11840	11840	11840
Wald Statistics	191542.6 * **	201576.1 * **	185744.9 * **	68872 * **	73177.9 * **	66455.5 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes

Table A4

HHI Extended Model (Mixed Effects Linear Model). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.21527 * **	-.2117 * **	-.17449 * **	-.21986 * **	-.2116 * **	-.16828 * **	-.16799 * **
	(.07265)	(.07297)	(.04925)	(.0838)	(.07583)	(.05133)	(.05138)
Size	.00638 * **	.00635 * **	.00476 * **	.00522 * **	.00666 * **	.00467 * **	.00457 * **
	(.00097)	(.00097)	(.00108)	(.0009)	(.00106)	(.00149)	(.00147)
PTBV	.00036 * **	.00036 * **	-.00106	.00047	.00036 * **	-.00114	-.0011
	(.00001)	(.00001)	(.00249)	(.00034)	(.00002)	(.00264)	(.00264)
Risk	-.00047	-.00042	-.00125	-.00061	-.00045	-.00112	-.00113
	(.00036)	(.00037)	(.00099)	(.00044)	(.00035)	(.00089)	(.00089)
Leverage	.00062					-.01036 *	-.00609
	(.00046)					(.00556)	(.0102)
HHI × Leverage	-.0073						-.0348
	(.00795)						(.07345)
Inventory		.00605				.00453	.01083
		(.00443)				(.00577)	(.02042)
HHI × Inventory		-.0363 *					-.03182
		(.02123)					(.08111)
R&D			-.00002			-.00015	-.00034
			(.00005)			(.00011)	(.00029)
HHI × R&D			.00002				.00078
			(.00021)				(.00142)
Fixed Assets				.00332		.00432	.00925
				(.00416)		(.00415)	(.00886)
HHI × Fixed Assets				-.00873			-.02004
				(.01264)			(.04377)
SGA					-.00337 * **	-.004	-.01107
					(.00114)	(.00602)	(.01199)

(*continued on next page*)

Table A4 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HHI × SGA					.01211 * **		.02942
					(.00377)		(.05262)
Intercept	-.04217 * *	-.04193 * *	-.03461 *	-.02649	-.0454 * *	-.03439	-.03342
	(.0191)	(.01921)	(.01819)	(.02111)	(.02022)	(.02115)	(.02066)
Random Coefficients							
Sector	-3.3912 * **	-3.39341 * **	-3.56765 * **	-3.32351 * **	-3.38788 * **	-3.62047 * **	-3.61707 * **
Firms	-4.09295 * **	-4.12188 * **	-4.19945 * **	-4.16398 * **	-4.10103 * **	-4.13341 * **	-4.14857 * **
Years	-3.86499 * **	-3.87452 * **	-3.95187 * **	-3.89649 * **	-3.87278 * **	-3.98783 * **	-3.98511 * **
Residuals	-4.79789 * **	-4.79943 * **	-4.82663 * **	-4.81238 * **	-4.82286 * **	-4.87774 * **	-4.88783 * **
Observations	11843	11788	4140	9777	11677	3441	3441
Wald Statistics	3734 * **	3750.5 * **	1357.7 * **	2834.8 * **	3738.9 * **	1086.7 * **	1087.3 * **
LR Statistics	4143.7 * **	4071 * **	1453 * **	3541.8 * **	4036.1 * **	1269.4 * **	1245.2 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A5

HHI Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measure (HHI), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.83141 * **	.82514 * **	.83116 * **	.82717 * **	.825 * **	.82776 * **	.82575 * **
	(.00501)	(.00465)	(.00868)	(.00581)	(.00473)	(.01053)	(.01049)
HHI	-.00323 * **	-.00274 * *	-.00507 * **	-.002	-.0029 * *	-.00547 * *	-.00411 *
	(.00124)	(.00136)	(.00183)	(.00152)	(.00146)	(.00215)	(.00217)
Size	.00012 *	.00015 * *	.00003	.00002	.00018 * *	-.00004	-.00002
	(.00007)	(.00008)	(.0001)	(.0001)	(.00008)	(.00016)	(.00016)
PTBV	-.00001	-.00001	-.00001	-.00027	-.00001	-.00001	.00001
	(.00002)	(.00001)	(.00098)	(.00029)	(.00001)	(.00097)	(.00096)
Risk	.00017	.00018	-.00009	.00015	.00017	-.00007	-.00005
	(.00013)	(.00013)	(.00034)	(.00015)	(.00013)	(.00033)	(.00033)
Leverage	-.00002					.00291	.01152
	(.00034)					(.00795)	(.01386)
HHI × Leverage	-.00244						-.07443
	(.00497)						(.08893)
Inventory		.00214 * *				-.00012	.00627
		(.00099)				(.00103)	(.00502)
HHI × Inventory		-.01058 * *					-.03744 *
		(.00509)					(.02008)
R&D			.00003			.00002	-.00006
			(.00003)			(.00003)	(.00007)
HHI × R&D			-.00008				.0004 * *
			(.0001)				(.0002)
Fixed Assets				.00106 *		-.00062	.00147
				(.00063)		(.00113)	(.00308)
HHI × Fixed Assets				-.00287			-.00782
				(.00201)			(.00908)
SGA					.00022	.00137	-.00052

(*continued on next page*)

Table A5 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
					(.0004)	(.00164)	(.00439)
HHI × SGA					-.00035		.0098
					(.00178)		(.01225)
Intercept	-.00278 * **	-.00335 * **	-.00103	-.00182	-.0036 * **	-.00023	-.00076
	(.00088)	(.00092)	(.00116)	(.00111)	(.001)	(.0018)	(.00181)
Observations	11676	11576	4086	9589	11476	3413	3405
Wald Statistics	68098.9 * **	67222.6 * **	24246.7 * **	47897.9 * **	67279.3 * **	19942.2 * **	38296.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A6

CR3 Extended Model (Mixed Effects Linear Model). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR3	-.0406 * **	-.03875 * **	-.03706 * **	-.03642 * **	-.03648 * **	-.02644 * **	-.02622 * **
	(.01048)	(.01088)	(.00813)	(.01301)	(.01217)	(.01012)	(.00988)
Size	.00884 * **	.00856 * **	.00712 * **	.00724 * **	.00922 * **	.00731 * **	.00706 * **
	(.00118)	(.00107)	(.00111)	(.00109)	(.0012)	(.00155)	(.00146)
PTBV	.00041 * **	.00041 * **	.00752 * **	.00109 *	.00041 * **	.00663 * **	.00661 * **
	(.00002)	(.00002)	(.00052)	(.00058)	(.00002)	(.00066)	(.00064)
Risk	-.0005	-.00043	-.00127	-.00066	-.0005	-.00104	-.00106
	(.00042)	(.00042)	(.00122)	(.00053)	(.00041)	(.00099)	(.001)
Leverage	.00065					-.01406	.01954
	(.00044)					(.00941)	(.01584)
CR3 × Leverage	-.00815						-.27352 * **
	(.00744)						(.08477)
Inventory		.01592 * *				.00609	.02311
		(.00703)				(.00472)	(.01776)
CR3 × Inventory		-.08807 * **					-.08663
		(.03388)					(.07713)
R&D			.00024 * **			.00004	-.00018
			(.00008)			(.00011)	(.00029)
CR3 × R&D			-.0008 * **				.0004
			(.00031)				(.0014)
Fixed Assets				.00952 * *		.00151	.00973
				(.00428)		(.00416)	(.00904)
CR3 × Fixed Assets				-.02662 * *			-.02182
				(.01331)			(.04471)
SGA					-.00085	-.00358	-.01133
					(.00079)	(.00623)	(.0126)
CR3 × SGA					-.00017		.02812
					(.00614)		(.0576)
Intercept	-.11483 * **	-.11119 * **	-.09624 * **	-.09654 * **	-.11861 * **	-.09722 * **	-.09494 * **
	(.01334)	(.0121)	(.01202)	(.01192)	(.01345)	(.01613)	(.01522)
Random Coefficients							
Sector	-5.31328 * **	-5.32857 * **	-5.18854 * **	-5.4504 * **	-5.30562 * **	-5.78056 * **	-5.58312 * **
Firms	-3.82771 * **	-3.87443 * **	-3.92507 * **	-3.89975 * **	-3.83278 * **	-3.85832 * **	-3.89049 * **
Years	-3.82508 * **	-3.83278 * **	-3.89164 * **	-3.85119 * **	-3.83619 * **	-3.92943 * **	-3.93004 * **

(*continued on next page*)

Table A6 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Residuals	-4.70812 * **	-4.71831 * **	-4.7664 * **	-4.7326 * **	-4.71796 * **	-4.79005 * **	-4.79376 * **
Observations	11843	11788	4140	9777	11677	3441	3441
Wald Statistics	2342 * **	2355 * **	658.2 * **	1572.6 * **	2377.6 * **	479.5 * **	497.8 * **
LR Statistics	2358.7 * **	2354.3 * **	770.8 * **	2080.6 * **	2368.6 * **	723.3 * **	716.4 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A7

CR3 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR3), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.82756 * **	.82252 * **	.83052 * **	.82478 * **	.82344 * **	.82822 * **	.82559 * **
	(.00491)	(.00471)	(.00861)	(.00582)	(.00483)	(.0104)	(.01034)
CR3	-.00537 * **	-.00388 * *	-.00361	-.00348	-.00308 *	-.00286	-.00218
	(.00168)	(.00172)	(.00262)	(.00236)	(.0018)	(.00304)	(.00316)
Size	.00014 *	.00017 * *	.00005	.00003	.00018 * *	.00002	.00001
	(.00007)	(.00008)	(.00011)	(.0001)	(.00008)	(.00016)	(.00016)
PTBV	-.00001	-.00001	-.00009	-.00027	-.00001	-.00012	-.00006
	(.00002)	(.00002)	(.00097)	(.00029)	(.00002)	(.00096)	(.00094)
Risk	.00016	.00017	-.00007	.00016	.00017	-.00007	-.00005
	(.00013)	(.00013)	(.00033)	(.00015)	(.00013)	(.00033)	(.00033)
Leverage	0					.00285	.01144
	(.00032)					(.00784)	(.01384)
CR3 × Leverage	-.00269						-.07499
	(.00461)						(.08889)
Inventory		.00244 * *				-.00007	.00652
		(.00101)				(.00114)	(.00512)
CR3 × Inventory		-.01215 * *					-.03948 *
		(.00516)					(.02081)
R&D			.00004			.00002	-.00006
			(.00003)			(.00003)	(.00008)
CR3 × R&D			-.00013				.00039 *
			(.00011)				(.00021)
Fixed Assets				.00114 *		-.00062	.00165
				(.00062)		(.00113)	(.00331)
CR3 × Fixed Assets				-.00315			-.00824
				(.00193)			(.00968)
SGA					.00031	.00106	-.00058
					(.00039)	(.00162)	(.00458)
CR3 × SGA					-.00087		.00962
					(.0017)		(.01285)
Intercept	-.00336 * **	-.00379 * **	-.00189	-.00212 *	-.00402 * **	-.00149	-.00163
	(.00087)	(.00091)	(.00124)	(.00109)	(.00097)	(.00172)	(.00177)
Observations	11676	11576	4086	9589	11476	3413	3405
Wald Statistics	65313.7 * **	63059.1 * **	25288.9 * **	46379.1 * **	63180.1 * **	21887.6 * **	30927.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(*continued on next page*)

Table A7 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A8

CR5 Extended Model (Mixed Effects Linear Model). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR5	-.03978 * **	-.03806 * **	-.02976 * **	-.03636 * **	-.03674 * **	-.02157 * **	-.02114 * **
	(.01163)	(.01158)	(.00766)	(.01321)	(.0123)	(.00746)	(.00727)
Size	.00865 * **	.00838 * **	.0072 * **	.00709 * **	.00902 * **	.00732 * **	.00708 * **
	(.0012)	(.0011)	(.00114)	(.00111)	(.00123)	(.00155)	(.00146)
PTBV	.0004 * **	.0004 * **	.00635 * **	.00094 *	.0004 * **	.00567 * **	.00566 * **
	(.00002)	(.00002)	(.00054)	(.00052)	(.00002)	(.00068)	(.00066)
Risk	-.00052	-.00045	-.00125	-.00067	-.00052	-.00103	-.00104
	(.00044)	(.00045)	(.00128)	(.00056)	(.00043)	(.00104)	(.00105)
Leverage	.00059					-.01325	.01776
	(.00041)					(.00891)	(.01556)
CR5 × Leverage	-.00707						-.25257 * **
	(.00674)						(.0857)
Inventory		.01548 * *				.00502	.02323
		(.00691)				(.00474)	(.01653)
CR5 × Inventory		-.08615 * **					-.09154
		(.03342)					(.07087)
R&D			.00023 * **			.00004	-.00019
			(.00008)			(.0001)	(.00028)
CR5 × R&D			-.00074 * *				.00047
			(.0003)				(.00133)
Fixed Assets				.00915 * *		.00167	.00975
				(.00415)		(.00378)	(.0086)
CR5 × Fixed Assets				-.02586 * *			-.02263
				(.01319)			(.04215)
SGA					-.00125 *	-.00317	-.01198
					(.00068)	(.00552)	(.01226)
CR5 × SGA					.00009		.03218
					(.00467)		(.05502)
Intercept	-.11151 * **	-.1081 * **	-.09663 * **	-.09377 * **	-.11525 * **	-.09707 * **	-.0948 * **
	(.01343)	(.01226)	(.01238)	(.01213)	(.01357)	(.01626)	(.01536)
Random Coefficients							
Sector	-5.2339 * **	-5.24691 * **	-5.10273 * **	-5.32832 * **	-5.22268 * **	-5.60257 * **	-5.46358 * **
Firms	-3.85074 * **	-3.89675 * **	-3.92128 * **	-3.92213 * **	-3.85801 * **	-3.86263 * **	-3.89471 * **
Years	-3.82983 * **	-3.83742 * **	-3.89419 * **	-3.85538 * **	-3.84071 * **	-3.93122 * **	-3.93158 * **
Residuals	-4.71404 * **	-4.72408 * **	-4.76766 * **	-4.73807 * **	-4.72388 * **	-4.79134 * **	-4.79485 * **
Observations	11843	11788	4140	9777	11677	3441	3441
Wald Statistics	2342 * **	2355 * **	658.2 * **	1572.6 * **	2377.6 * **	479.5 * **	497.8 * **
LR Statistics	2358.7 * **	2354.3 * **	770.8 * **	2080.6 * **	2368.6 * **	723.3 * **	716.4 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A9

CR5 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator). The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR5), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.82425 * **	.81887 * **	.82835 * **	.82169 * **	.81953 * **	.82693 * **	.82433 * **
	(.00502)	(.00482)	(.00851)	(.00582)	(.00489)	(.01024)	(.01031)
CR5	-.00622 * **	-.00541 * **	-.00445 * **	-.00547 * **	-.00506 * **	-.00355 * *	-.00303 *
	(.00121)	(.00134)	(.0016)	(.00173)	(.00141)	(.00174)	(.00177)
Size	.00015 * *	.00018 * *	.00007	.00003	.0002 * *	.00002	.00001
	(.00007)	(.00008)	(.00011)	(.0001)	(.00008)	(.00015)	(.00016)
PTBV	-.00001	-.00001	-.00005	-.00028	-.00001	-.00011	-.00006
	(.00002)	(.00002)	(.00098)	(.00031)	(.00002)	(.00099)	(.00098)
Risk	.00015	.00017	-.00006	.00015	.00016	-.00007	-.00006
	(.00013)	(.00013)	(.00034)	(.00015)	(.00013)	(.00033)	(.00034)
Leverage	-.00001					.00233	.01108
	(.00032)					(.00807)	(.01415)
CR5 × Leverage	-.00252						-.07549
	(.00462)						(.09139)
Inventory		.00211 * *				-.00021	.00612
		(.00088)				(.00112)	(.00508)
CR5 × Inventory		-.01056 * *					-.03723 *
		(.00451)					(.02066)
R&D			.00003			.00002	-.00006
			(.00003)			(.00003)	(.00007)
CR5 × R&D			-.0001				.00037 *
			(.00009)				(.0002)
Fixed Assets				.001 *		-.00063	.00158
				(.00058)		(.0011)	(.00328)
CR5 × Fixed Assets				-.00248			-.00768
				(.00166)			(.00941)
SGA					.00017	.00121	-.00059
					(.00037)	(.00156)	(.0046)
CR5 × SGA					-.00024		.00927
					(.00152)		(.01263)
Intercept	-.0034 * **	-.00388 * **	-.00197	-.00197 *	-.00406 * **	-.00137	-.00157
	(.00085)	(.0009)	(.00121)	(.00108)	(.00095)	(.0017)	(.00175)
Observations	11676	11576	4086	9589	11476	3413	3405
Wald Statistics	65313.7 * **	63059.1 * **	25288.9 * **	46379.1 * **	63180.1 * **	21887.6 * **	30927.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A10

HHI Extended Model (Mixed Effects Linear Model) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital

expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.20663 * **	-.20324 * **	-.16617 * **	-.21284 * **	-.20189 * **	-.16165 * **	-.16151 * **
	(.06854)	(.06868)	(.04412)	(.07974)	(.0717)	(.04656)	(.04634)
Size	.00727 * **	.00724 * **	.00576 * **	.00596 * **	.00765 * **	.00559 * **	.00551 * **
	(.00101)	(.00102)	(.00124)	(.00102)	(.00108)	(.00167)	(.00167)
PTBV	.00038 * **	.00038 * **	.00068	.00052	.00038 * **	.00071	.00076
	(.00002)	(.00002)	(.00229)	(.00037)	(.00002)	(.00247)	(.00247)
Risk	-.00066 * *	-.00061 *	-.00135	-.00082 * *	-.00064 * *	-.00118	-.00119
	(.00033)	(.00034)	(.00105)	(.00039)	(.00032)	(.00094)	(.00094)
Leverage	.00104 * *					-.01448	-.01451
	(.00049)					(.01597)	(.02292)
HHI × Leverage	-.01399 *						-.00074
	(.00831)						(.0813)
Inventory		.00616				.00641	.01156
		(.00489)				(.00603)	(.0231)
HHI × Inventory		-.038					-.02418
		(.02338)					(.09267)
R&D			-.00001			-.00016	-.00032
			(.00005)			(.00013)	(.0003)
HHI × R&D			-.00004				.00066
			(.00025)				(.00146)
Fixed Assets				.00357		.0044	.00892
				(.00433)		(.00472)	(.00897)
HHI × Fixed Assets				-.00952			-.01849
				(.01276)			(.04512)
SGA					-.00321 * **	-.00512	-.01273
					(.00102)	(.00669)	(.01244)
HHI × SGA					.01063 * *		.02938
					(.00423)		(.05394)
Intercept	-.05461 * **	-.05428 * **	-.04885 * *	-.03661 *	-.0592 * **	-.04694 * *	-.04612 * *
	(.01866)	(.01871)	(.0196)	(.02127)	(.01969)	(.0226)	(.02232)
Random Coefficients							
Sector	-3.44042 * **	-3.44144 * **	-3.6277 * **	-3.3546 * **	-3.44055 * **	-3.67639 * **	-3.67317 * **
Firms	-3.97516 * **	-4.00412 * **	-4.06449 * **	-4.05081 * **	-3.97981 * **	-4.01826 * **	-4.03026 * **
Years	-3.88295 * **	-3.89169 * **	-3.97964 * **	-3.91489 * **	-3.89531 * **	-4.02835 * **	-4.02703 * **
Residuals	-4.7425 * **	-4.75312 * **	-4.82591 * **	-4.77277 * **	-4.75418 * **	-4.85829 * **	-4.85913 * **
Observations	9814	9775	3377	8049	9664	2793	2793
Wald Statistics	3603.2 * **	3632.1 * **	1335.7 * **	2739.5 * **	3638.6 * **	1085 * **	1084.5 * **
LR Statistics	3990.8 * **	3927.1 * **	1410.5 * **	3428 * **	3894.8 * **	1249.5 * **	1228.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A11

HHI Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are

estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (HHI), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.86325 * **	.86144 * **	.87444 * **	.87323 * **	.86062 * **	.88113 * **	.8809 * **
	(.00696)	(.00686)	(.01245)	(.00785)	(.00698)	(.01442)	(.01476)
HHI	-.00323 * **	-.00341 * **	-.00556 * **	-.0027 * *	-.00324 * **	-.00625 * **	-.00579 * **
	(.00098)	(.0012)	(.0019)	(.00123)	(.00123)	(.00209)	(.00221)
Size	.00022 * **	.00023 * **	.00025 * **	.00017 * *	.00028 * **	.00022 *	.00022 *
	(.00006)	(.00006)	(.00008)	(.00007)	(.00007)	(.00012)	(.00012)
PTBV	.00001	.00001	.00122 * **	-.00014	.00001	.00116 * **	.00116 * **
	(.00002)	(.00001)	(.00032)	(.0002)	(.00001)	(.00031)	(.00031)
Risk	-.00021	-.00016	-.00039	-.00019	-.00018	-.00028	-.00029
	(.00023)	(.00022)	(.00043)	(.00029)	(.00022)	(.00041)	(.00041)
Leverage	.00048					-.00664	.00205
	(.00048)					(.00889)	(.01666)
HHI × Leverage	-.00965						-.0597
	(.00784)						(.08656)
Inventory		.00067				-.00012	-.00126
		(.00088)				(.00054)	(.00332)
HHI × Inventory		-.00312					.00891
		(.00439)					(.01607)
R&D			.00002			.00001	-.00001
			(.00003)			(.00002)	(.00004)
HHI × R&D			-.00007				.0001
			(.00009)				(.00016)
Fixed Assets				.0006		-.0004	.00176
				(.00041)		(.00082)	(.00176)
HHI × Fixed Assets				-.00195			-.00888
				(.00136)			(.00603)
SGA					-.00009	.0006	-.00285
					(.00026)	(.00095)	(.00357)
HHI × SGA					.00059		.01269
					(.00113)		(.01049)
Intercept	-.0053 * **	-.00535 * **	-.00476 * **	-.00428 * **	-.00591 * **	-.0042 * **	-.00425 * **
	(.00078)	(.00081)	(.00104)	(.00089)	(.00089)	(.00143)	(.00147)
Observations	8982	8905	3067	7294	8803	2543	2537
Wald Statistics	130047.5 * **	131861.2 * **	45035.8 * **	97595.6 * **	131920 * **	43797.4 * **	55312.2 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A12

CR3 Extended Model (Mixed Effects Linear Model) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							

(*continued on next page*)

Table A12 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CR3	-.04694 * **	-.04527 * **	-.04488 * **	-.04502 * **	-.04334 * **	-.04015 * **	-.03983 * **
	(.01203)	(.0126)	(.00616)	(.01578)	(.0137)	(.00914)	(.00892)
Size	.00963 * **	.00934 * **	.0079 * **	.00794 * **	.01013 * **	.00815 * **	.00794 * **
	(.00123)	(.00113)	(.00121)	(.00122)	(.00124)	(.00163)	(.00157)
PTBV	.00042 * **	.00042 * **	.00904 * **	.00105 *	.00042 * **	.0081 * **	.00811 * **
	(.00002)	(.00002)	(.00053)	(.0006)	(.00002)	(.00066)	(.00065)
Risk	-.00066 *	-.0006	-.00124	-.00084 *	-.00068 *	-.001	-.00101
	(.00038)	(.00038)	(.00126)	(.00048)	(.00037)	(.00103)	(.00104)
Leverage	.00116 * **					-.02618	.00794
	(.00041)					(.01893)	(.03553)
CR3 × Leverage	-.0165 * *						-.22497 *
	(.00695)						(.11529)
Inventory		.01563 * *				.00862	.0225
		(.00769)				(.00541)	(.01978)
CR3 × Inventory		-.08727 * *					-.06713
		(.03707)					(.08516)
R&D			.00025 * **			.00003	-.00015
			(.00009)			(.00012)	(.0003)
CR3 × R&D			-.00089 * *				.00021
			(.00038)				(.00149)
Fixed Assets				.00981 * *		.00115	.00899
				(.00405)		(.00483)	(.00968)
CR3 × Fixed Assets				-.02912 * *			-.01991
				(.01255)			(.04859)
SGA					-.00036	-.00668	-.01414
					(.00092)	(.00726)	(.01369)
CR3 × SGA					-.00426		.02525
					(.00793)		(.06281)
Intercept	-.12389 * **	-.12009 * **	-.10548 * **	-.10428 * **	-.12892 * **	-.10662 * **	-.1046 * **
	(.01397)	(.0127)	(.01331)	(.01329)	(.01386)	(.0171)	(.01645)
Random Coefficients							
Sector	-5.28654 * **	-5.30422 * **	-5.1929 * **	-5.406 * **	-5.29114 * **	-5.77126 * **	-5.58697 * **
Firms	-3.74658 * **	-3.79261 * **	-3.84523 * **	-3.82339 * **	-3.74969 * **	-3.80135 * **	-3.82591 * **
Years	-3.83742 * **	-3.84506 * **	-3.91848 * **	-3.86419 * **	-3.85097 * **	-3.96001 * **	-3.96094 * **
Residuals	-4.70148 * **	-4.71211 * **	-4.77102 * **	-4.72666 * **	-4.71306 * **	-4.79784 * **	-4.80152 * **
Observations	9814	9775	3377	8049	9664	2793	2793
Wald Statistics	2321.5 * **	2338 * **	729.7 * **	1569.1 * **	2390.3 * **	535.9 * **	553.9 * **
LR Statistics	2385.9 * **	2378.1 * **	777.5 * **	2106.5 * **	2409.7 * **	727 * **	719.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A13

CR3 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR3), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.86194 * **	.86077 * **	.87876 * **	.87283 * **	.86061 * **	.8835 * **	.88348 * **

(*continued on next page*)

Table A13 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(.00699)	(.00698)	(.01305)	(.00803)	(.00711)	(.01481)	(.01522)
CR3	-.00313 * *	-.00201	-.00105	-.00132	-.00132	-.00077	-.00081
	(.00151)	(.00156)	(.00238)	(.002)	(.00164)	(.00283)	(.00268)
Size	.00022 * **	.00023 * **	.00023 * *	.00016 * *	.00027 * **	.00027 * *	.00025 * *
	(.00006)	(.00007)	(.00009)	(.00007)	(.00007)	(.00012)	(.00013)
PTBV	.00001	.00001	.00104 * **	-.00014	.00001	.00096 * **	.00098 * **
	(.00002)	(.00001)	(.0003)	(.0002)	(.00001)	(.00028)	(.00029)
Risk	-.00022	-.00018	-.00035	-.00018	-.0002	-.00028	-.00027
	(.00024)	(.00022)	(.00042)	(.00029)	(.00023)	(.00041)	(.00041)
Leverage	.00051					-.00577	.00508
	(.00048)					(.00917)	(.01641)
CR3 × Leverage	-.01001						-.07703
	(.0078)						(.08245)
Inventory		.00117				-.00005	-.00061
		(.00093)				(.00063)	(.00329)
CR3 × Inventory		-.00577					.00543
		(.00467)					(.016)
R&D			.00003			.00001	-.00001
			(.00003)			(.00002)	(.00005)
CR3 × R&D			-.00013				.0001
			(.00011)				(.00017)
Fixed Assets				.00075 *		-.00045	.00192
				(.00043)		(.00082)	(.00193)
CR3 × Fixed Assets				-.00261 *			-.0095
				(.00142)			(.00693)
SGA					.00012	.00023	-.00309
					(.00025)	(.00104)	(.00391)
CR3 × SGA					-.00053		.01284
					(.00104)		(.01172)
Intercept	-.00562 * **	-.00572 * **	-.00523 * **	-.00461 * **	-.00625 * **	-.00548 * **	-.00535 * **
	(.00079)	(.00083)	(.00119)	(.00089)	(.00089)	(.00153)	(.00154)
Observations	8982	8905	3067	7294	8803	2543	2537
Wald Statistics	140426.4 * **	141102.7 * **	46526.1 * **	101676.4 * **	139611.5 * **	46019.6 * **	67422.4 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A14

CR5 Extended Model (Mixed Effects Linear Model) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR5	-.0473 * **	-.04532 * **	-.03998 * **	-.04586 * **	-.04424 * **	-.03389 * **	-.03349 * **
	(.01248)	(.01262)	(.0054)	(.01489)	(.01332)	(.00741)	(.00675)
Size	.00938 * **	.00912 * **	.00796 * **	.00777 * **	.00989 * **	.00821 * **	.008 * **
	(.00126)	(.00116)	(.00124)	(.00123)	(.00127)	(.00162)	(.00156)
PTBV	.00041 * **	.00041 * **	.00927 * **	.00095	.00041 * **	.00828 * **	.00828 * **
	(.00002)	(.00002)	(.00048)	(.00065)	(.00002)	(.00051)	(.0005)
Risk	-.0007 *	-.00064	-.0013	-.00089 *	-.00071 *	-.00106	-.00107
	(.00041)	(.00041)	(.00131)	(.00052)	(.0004)	(.00109)	(.00109)

(*continued on next page*)

Table A14 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Leverage	.00117 * *					-.02474	.00665
	(.00047)					(.01863)	(.03514)
CR5 × Leverage	-.01662 * *						-.20688 *
	(.00785)						(.11587)
Inventory		.01505 * *				.00738	.02083
		(.00749)				(.00474)	(.01824)
CR5 × Inventory		-.0847 * *					-.06235
		(.03613)					(.07877)
R&D			.00024 * **			.00003	-.00014
			(.00009)			(.00011)	(.00028)
CR5 × R&D			-.00088 * *				.00017
			(.00035)				(.00138)
Fixed Assets				.00938 * *		.00116	.00881
				(.00392)		(.00428)	(.00887)
CR5 × Fixed Assets				-.02862 * *			-.02048
				(.01266)			(.04442)
SGA					-.0009	-.00587	-.01495
					(.00079)	(.00602)	(.01338)
CR5 × SGA					-.00374		.03016
					(.0064)		(.05901)
Intercept	-.11986 * **	-.11646 * **	-.10519 * **	-.10112 * **	-.12504 * **	-.10665 * **	-.1047 * **
	(.01416)	(.01296)	(.01345)	(.01353)	(.01409)	(.01701)	(.01643)
Random Coefficients							
Sector	-5.29284 * **	-5.29929 * **	-5.19311 * **	-5.33415 * **	-5.27455 * **	-5.64363 * **	-5.51363 * **
Firms	-3.77445 * **	-3.81891 * **	-3.84958 * **	-3.8497 * **	-3.77857 * **	-3.80755 * **	-3.83139 * **
Years	-3.84236 * **	-3.84975 * **	-3.92077 * **	-3.86854 * **	-3.85576 * **	-3.95962 * **	-3.96045 * **
Residuals	-4.70862 * **	-4.71888 * **	-4.77325 * **	-4.73322 * **	-4.72017 * **	-4.7979 * **	-4.80137 * **
Observations	9814	9775	3377	8049	9664	2793	2793
Wald Statistics	2464.8 * **	2473.9 * **	749.4 * **	1675.4 * **	2529.9 * **	536.1 * **	553.3 * **
LR Statistics	2389.7 * **	2375.7 * **	796.8 * **	2096.4 * **	2405.9 * **	735.4 * **	731.8 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A15

CR5 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – No Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR5), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.86285 * **	.86181 * **	.87965 * **	.87523 * **	.86154 * **	.88547 * **	.88558 * **
	(.00733)	(.00729)	(.0134)	(.00823)	(.00741)	(.01488)	(.01557)
CR5	-.00145	-.00074	-.0006	.00073	-.00028	.0006	.00055
	(.00122)	(.00143)	(.00167)	(.0018)	(.00149)	(.00205)	(.00205)
Size	.00022 * **	.00022 * **	.00022 * *	.00015 * *	.00027 * **	.00025 * *	.00024 *
	(.00006)	(.00007)	(.0001)	(.00007)	(.00007)	(.00013)	(.00013)
PTBV	.00001	.00001	.00104 * **	-.00014	.00001	.00094 * **	.00095 * **
	(.00002)	(.00001)	(.00029)	(.0002)	(.00001)	(.00028)	(.00029)
Risk	-.00023	-.00017	-.00036	-.00016	-.00019	-.00028	-.00027

(*continued on next page*)

Table A15 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(.00024)	(.00022)	(.00043)	(.00028)	(.00023)	(.00041)	(.00041)
Leverage	.00051					-.00575	.00505
	(.0005)					(.00917)	(.01633)
CR5 × Leverage	-.01008						-.07729
	(.00817)						(.08221)
Inventory		.00132				.00002	.00003
		(.00099)				(.00062)	(.00347)
CR5 × Inventory		-.00651					.00204
		(.00497)					(.01662)
R&D			.00003			.00001	-.00002
			(.00003)			(.00002)	(.00005)
CR5 × R&D			-.00012				.00015
			(.0001)				(.00017)
Fixed Assets				.0008 *		-.00054	.00194
				(.00043)		(.0008)	(.00192)
CR5 × Fixed Assets				-.00284 *			-.01012
				(.00147)			(.00679)
SGA					.00015	.00023	-.00318
					(.00026)	(.00106)	(.00384)
CR5 × SGA					-.00067		.01362
					(.00109)		(.01143)
Intercept	-.00559 * **	-.00566 * **	-.00511 * **	-.00455 * **	-.00622 * **	-.00536 * **	-.00522 * **
	(.00081)	(.00084)	(.00119)	(.00089)	(.0009)	(.00154)	(.00156)
Observations	8982	8905	3067	7294	8803	2543	2537
Wald Statistics	142741.5 * **	141756.8 * **	46863.9 * **	103285.8 * **	139648.4 * **	44503.9 * **	69032.9 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A16

HHI Extended Model (Mixed Effects Linear Model) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.00308 * *	-.00319 * *	-.00522 * *	-.00349 * *	-.00313 * *	-.0078 * **	-.00516 * *
	(.00145)	(.00139)	(.00254)	(.00164)	(.00149)	(.00202)	(.0024)
Size	.00005	.00005	.0001	.00002	.00001	.00008	.00001
	(.0001)	(.00012)	(.00015)	(.00016)	(.00011)	(.00021)	(.00034)
PTBV	.02774 * **	.02633 * **	-.41159 * *	.02834 * **	.02602 * **	-.41412 * *	-.41147 * *
	(.00736)	(.00699)	(.16333)	(.00789)	(.00687)	(.16531)	(.16977)
Risk	.00067	.00077	-.00029	.00089	.00075	-.00045	-.00059
	(.00095)	(.00095)	(.00154)	(.0011)	(.00096)	(.00195)	(.00202)
Leverage	-.0091 * **					-.00991 * **	.06147 * **
	(.00297)					(.00118)	(.02092)
HHI × Leverage	.04117 * *						-.64506 * **
	(.01759)						(.18583)
Inventory		-.00161				-.00471 *	-.00298
		(.00148)				(.00243)	(.01622)
HHI × Inventory		.00952					-.048

(*continued on next page*)

Table A16 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		(.00989)					(.16496)
R&D			.00002			.00009	.00072 * *
			(.00008)			(.00009)	(.00032)
HHI × R&D			-.00006				-.00188
			(.00021)				(.00153)
Fixed Assets				-.00001		-.00224	-.00625
				(.00078)		(.00257)	(.01007)
HHI × Fixed Assets				.00029			.02409
				(.00186)			(.04657)
SGA					.00027	.00461	.01665
					(.00072)	(.00343)	(.02003)
HHI × SGA					.0008		-.04344
					(.00207)		(.07673)
Intercept	-.01871 * **	-.01876 * **	-.01761 * **	-.01839 * **	-.01839 * **	-.01653 * **	-.01622 * **
	(.00078)	(.00105)	(.00091)	(.00152)	(.00077)	(.001)	(.00178)
Random Coefficients							
Sector	-8.10109 * **	-8.08818 * **	-7.5939 * **	-8.02526 * **	-8.08808 * **	-7.51835 * **	-7.52723 * **
Firms	-6.04862 * **	-6.0496 * **	-6.01819 * **	-6.03095 * **	-6.04955 * **	-5.99893 * **	-5.99505 * **
Years	-3.96066 * **	-3.95943 * **	-3.96925 * **	-3.96223 * **	-3.95939 * **	-3.97392 * **	-3.97689 * **
Residuals	-5.28508	-5.28348	-5.31028	-5.29029	-5.28344	-5.31965	-5.32153
Observations	2029	2013	763	1728	2013	648	648
Wald Statistics	164 * **	236.4 * **	44 * **	67.6 * **	220.6 * **	NA	NA
LR Statistics	0	0	0	0	0	0	0
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A17

HHI Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (HHI), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	0	0	-.06595 *	0	0	-.0495 *	-.05732 * *
	(0)	(0)	(.03383)	(0)	(0)	(.02613)	(.02737)
HHI	-.00012	.00003	-.00173 * *	-.00016	-.00001	-.0021 * *	-.00213 * *
	(.00047)	(.00049)	(.00085)	(.00051)	(.00048)	(.00089)	(.00091)
Size	.00005 *	.00006 * *	.00012 * *	.0001 * *	.00006 *	.00015 * *	.00019 * *
	(.00003)	(.00003)	(.00006)	(.00004)	(.00003)	(.00007)	(.00008)
PTBV	.00298	.00312 *	0	.00349 * *	.00311 *	0	0
	(.00188)	(.00187)	(0)	(.00169)	(.00184)	(0)	(0)
Risk	.00016	.00015	-.0006 * *	.00015	.00015	-.00054 * *	-.0006 * *
	(.0001)	(.0001)	(.00028)	(.00012)	(.00011)	(.00027)	(.00027)
Leverage	-.00045					-.0004	-.01434
	(.00038)					(.00043)	(.00892)
HHI × Leverage	.00295 * *						.12352
	(.0013)						(.08101)
Inventory		.00028				.0005	.00462

(*continued on next page*)

Table A17 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		(.00036)				(.00099)	(.00363)
HHI × Inventory		-.00308					-.03103
		(.00227)					(.02383)
R&D			-.00001			0	.00014 * *
			(.00003)			(.00003)	(.00006)
HHI × R&D			0				-.00047 * *
			(.00007)				(.0002)
Fixed Assets				-.0002 * *		-.00016	-.00327 * **
				(.00009)		(.00075)	(.00088)
HHI × Fixed Assets				.00012			.01312 * **
				(.00021)			(.00352)
SGA					.0001	-.00006	.00349
					(.00019)	(.00107)	(.003)
HHI × SGA					-.00061		-.01512 *
					(.00042)		(.00865)
Intercept	-.00504 * **	-.00518 * **	-.00643 * **	-.0055 * **	-.0051 * **	-.00627 * **	-.00685 * **
	(.00033)	(.00036)	(.00108)	(.0004)	(.00038)	(.00098)	(.00101)
Observations	1347	1334	508	1148	1334	436	434
Wald Statistics	5267.4 * **	5561.6 * **	5706.3 * **	6202.4 * **	5424.6 * **	3781.4 * **	26163.6 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A18

CR3 Extended Model (Mixed Effects Linear Model) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR3	.03005	.02818	.04019 *	.02939	.02791	.04296 *	.04388 *
	(.01942)	(.01882)	(.02289)	(.01976)	(.0194)	(.02385)	(.0236)
Size	.00003	.00005	-.00013	.0001	.00007	.00011	.00012
	(.00011)	(.00013)	(.00017)	(.00019)	(.00014)	(.00022)	(.00035)
PTBV	0 * **	0 * **	-.00004 * *	0 * **	0 * **	-.00004 * *	-.00004 * *
	(0)	(0)	(.00002)	(0)	(0)	(.00002)	(.00002)
Risk	.00076	.00082	-.00002	.00089	.00077	-.00035	-.00049
	(.00083)	(.00084)	(.0014)	(.00098)	(.00086)	(.00177)	(.00185)
Leverage	0 * *					0 * **	.00001 * **
	(0)					(0)	(0)
CR3 × Leverage	0						-.00008 * **
	(0)						(.00001)
Inventory		0				0	0
		(0)				(0)	(0)
CR3 × Inventory		0					0
		(0)					(0)
R&D			0			0	0
			(0)			(0)	(0)
CR3 × R&D			0				0 *
			(0)				(0)
Fixed Assets				0		0	0
				(0)		(0)	(0)

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Table A18 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CR3 × Fixed Assets				0			0
				(0)			(0)
SGA					0	0	0
					(0)	(0)	(0)
CR3 × SGA					0		0
					(0)		(0)
Intercept	-.02057 * **	-.02059 * **	-.01833 * **	-.02101 * **	-.02071 * **	-.02033 * **	-.02027 * **
	(.00146)	(.0015)	(.00144)	(.0024)	(.00162)	(.00218)	(.00309)
Random Coefficients							
Sector	-6.72562	-7.12363	-7.34187 * **	-7.08199 *	-7.21535 *	-7.27067 * **	-7.22059 * **
Firms	-6.04453 * **	-6.04574 * **	-6.01738 * **	-6.02597 * **	-6.04596 * **	-5.99958 * **	-5.99574 * **
Years	-3.96891 * **	-3.96705 * **	-3.98701 * **	-3.97017 * **	-3.96666 * **	-3.99248 * **	-3.99699 * **
Residuals	-5.28715	-5.28639	-5.32267	-5.29285	-5.28639	-5.33246	-5.33507
Observations	2029	2013	763	1728	2013	648	648
Wald Statistics	3394.2 * **	127.6 * **	72 * **	110.3 * **	169.6 * **	NA	NA
LR Statistics	0	0	0	0	0	0	0
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A19

CR3 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR3 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR3), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	0	0	-.09485	0	0	-.07818	-.09118
	(0)	(0)	(.06794)	(0)	(0)	(.0667)	(.07505)
CR3	.00103	.0011	.00544 *	.00138 *	.00118 *	.00632 *	.00698 *
	(.00068)	(.00069)	(.00318)	(.00081)	(.0007)	(.00358)	(.00406)
Size	.00005	.00006 *	.00012	.0001 * **	.00006 *	.0002 * *	.00025 * *
	(.00003)	(.00003)	(.00008)	(.00004)	(.00003)	(.0001)	(.00012)
PTBV	.00287	.003	0	.00344 *	.00303	0	0
	(.00203)	(.00201)	(0)	(.00185)	(.00198)	(0)	(0)
Risk	.00016	.00016	-.00069	.00014	.00016	-.00071	-.0008
	(.0001)	(.0001)	(.00046)	(.00011)	(.0001)	(.00047)	(.00051)
Leverage	-.00048					-.00073	-.00574
	(.00038)					(.00096)	(.01415)
CR3 × Leverage	.00281 * *						.04218
	(.00123)						(.13294)
Inventory		.00035				.0024	.0061
		(.00034)				(.0019)	(.00396)
CR3 × Inventory		-.00352					-.02599
		(.00216)					(.03185)
R&D			.00002			-.00004	.00014 *
			(.00003)			(.00004)	(.00008)
CR3 × R&D			-.00006				-.00063
			(.00009)				(.00038)
Fixed Assets				-.00018 *		.00074	-.00303 * **

(*continued on next page*)

Table A19 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(.00009)		(.00121)	(.00107)
CR3 × Fixed Assets				-.00005			.01704 * **
				(.00021)			(.00642)
SGA					.00008	-.00214	.00207
					(.0002)	(.00202)	(.00434)
CR3 × SGA					-.00067		-.02029 *
					(.00046)		(.01176)
Intercept	-.00506 * **	-.00517 * **	-.00764 * **	-.00556 * **	-.00514 * **	-.0081 * **	-.00882 * **
	(.00033)	(.00036)	(.00218)	(.00039)	(.00037)	(.00229)	(.00271)
Observations	1372	1361	515	1174	1361	440	440
Wald Statistics	5253.5 * **	5574.5 * **	1868.5 * **	5151.9 * **	5227.3 * **	4005.8 * **	25589 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A20

CR5 Extended Model (Mixed Effects Linear Model) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR5	-.0026	-.00297	-.0061	-.00418	-.00334	-.00793	-.00684
	(.01397)	(.01428)	(.01626)	(.01423)	(.01411)	(.01591)	(.01625)
Size	.00005	.00005	.0001	0	.00001	.00009	-.00001
	(.00012)	(.00014)	(.00015)	(.00021)	(.00015)	(.00022)	(.00032)
PTBV	.02786 * **	.02642 * **	-.40809 * *	.02826 * **	.02604 * **	-.40871 * *	-.40918 * *
	(.00707)	(.00667)	(.1664)	(.00749)	(.00653)	(.16898)	(.17486)
Risk	.00065	.00074	-.00032	.00085	.00072	-.00049	-.00062
	(.00093)	(.00094)	(.00155)	(.0011)	(.00095)	(.00196)	(.00203)
Leverage	-.00885 * **					-.00974 * **	.06239 * *
	(.00322)					(.00136)	(.02777)
CR5 × Leverage	.0392 * *						-.65202 * *
	(.01952)						(.25547)
Inventory		-.00108				-.00491 *	-.00295
		(.00253)				(.00261)	(.02021)
CR5 × Inventory		.00638					-.04667
		(.01757)					(.19144)
R&D			.00003			.0001	.00075 * *
			(.00008)			(.00007)	(.00032)
CR5 × R&D			-.00007				-.00181
			(.00024)				(.0013)
Fixed Assets				.00011		-.0027	-.00597
				(.00076)		(.00195)	(.01005)
CR5 × Fixed Assets				.00005			.01845
				(.00237)			(.0439)
SGA					.00048	.00511 *	.01539
					(.00088)	(.00294)	(.02029)
CR5 × SGA					.00001		-.03356
					(.0026)		(.07223)
Intercept	-.01892 * **	-.01893 * **	-.01769 * **	-.01836 * **	-.0185 * **	-.01698 * **	-.01607 * **
	(.00187)	(.00208)	(.00224)	(.00271)	(.00213)	(.00269)	(.0025)

(*continued on next page*)

Table A20 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Random Coefficients							
Sector	-8.1396 * **	-8.11726 * **	-7.58304 * **	-8.04421 * **	-8.11129 * **	-7.54159 * **	-7.51505 * **
Firms	-6.04906 * **	-6.05005 * **	-6.01847 * **	-6.03138 * **	-6.05 * **	-6 * **	-5.99534 * **
Years	-3.96061 * **	-3.95942 * **	-3.97016 * **	-3.96238 * **	-3.95945 * **	-3.97513 * **	-3.97825 * **
Residuals	-5.28515	-5.28358	-5.31088	-5.2905	-5.28357	-5.32084	-5.32245
Observations	2029	2013	763	1728	2013	648	648
Wald Statistics	159.5 * **	26 * **	70.9 * **	37.7 * **	55.6 * **	NA	NA
LR Statistics	0	0	0	0	0	0	0
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A21

CR5 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Crisis Period. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR5 is the three-firm concentration ratios, representing the combined market share of the three largest firms in an industry. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to equity, representing the firm's capital structure. Inventory is the ratio of inventory to sales, reflecting the firm's inventory management efficiency. R&D is the ratio of research and development expenses to sales, representing the firm's innovation intensity. Fixed Assets is the ratio of new plant and equipment to total fixed assets, capturing the firm's capital expenditure intensity. SGA is the ratio of selling, general, and administrative expenses to sales, reflecting the firm's overhead cost structure. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR5), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	0	0	0	0	0	0	-.10526
	(0)	(0)	(0)	(0)	(0)	(0)	(.0856)
CR5	-.00048	-.00045	-.00083	-.00044	-.00045	-.0007	.00575
	(.00047)	(.00047)	(.00063)	(.00051)	(.00047)	(.00068)	(.00526)
Size	.00005	.00006 *	.00004	.00009 * *	.00005	.00012 *	.00025 * *
	(.00003)	(.00003)	(.00004)	(.00004)	(.00003)	(.00006)	(.00011)
PTBV	.00285	.00298	-.0936 * *	.00337 * *	.00297	-.07236	.00237
	(.00191)	(.00189)	(.04678)	(.00172)	(.00187)	(.04661)	(.10532)
Risk	.00016	.00015	-.00017	.00014	.00016	-.00025	-.00074
	(.0001)	(.0001)	(.00018)	(.00011)	(.0001)	(.0002)	(.00046)
Leverage	-.00049					-.0001	-.00132
	(.00039)					(.00031)	(.00097)
CR5 × Leverage	.003 * *						0
	(.0013)						(0)
Inventory		.0002				-.00023	.00866 *
		(.00034)				(.00093)	(.00505)
CR5 × Inventory		-.00252					-.04658 * *
		(.00215)					(.02292)
R&D			0			.00001	.00013 * *
			(.00002)			(.00002)	(.00006)
CR5 × R&D			0				-.00057 *
			(.00005)				(.00032)
Fixed Assets				-.0002 * *		-.00064	-.00329 * **
				(.00009)		(.00063)	(.00106)
CR5 × Fixed Assets				.00014			.01796 * *
				(.00021)			(.00752)
SGA					.00012	.00063	.00284
					(.00018)	(.00092)	(.00402)
CR5 × SGA					-.00058		-.02113 *
					(.00039)		(.01278)
Intercept	-.00496 * **	-.00507 * **	-.00452 * **	-.00539 * **	-.00498 * **	-.00525 * **	-.00952 * **

(*continued on next page*)

Table A21 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(.00033)	(.00036)	(.00046)	(.0004)	(.00037)	(.00064)	(.00335)
Observations	1372	1361	515	1174	1361	440	440
Wald Statistics	5249.2 * **	5542.1 * **	1741.6 * **	6103.1 * **	5542.2 * **	3452.8 * **	9781.8 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A22

HHI Extended Model (Mixed Effects Linear Model) – Alternative Proxies**.** The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to total assets. Inventory is the natural log of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
HHI	-.24606 * **	-.2409 * **	-.17245 * **	-.24219 * **	-.24361 * **	-.17433 * **	-.16803 * **
	(.08586)	(.08429)	(.05347)	(.09329)	(.0882)	(.05473)	(.04604)
Size	.0015 * **	.00135 * **	-.00003	.00082 * **	.00144 * **	-.00072	-.0008
	(.0003)	(.00029)	(.00044)	(.00027)	(.00035)	(.00056)	(.00054)
PTBV	0 * **	0 * **	0	0	0 * **	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Risk	-.00018	-.0002	-.00133	-.00048	-.00023	-.0012	-.00118
	(.00038)	(.00038)	(.00108)	(.00048)	(.00037)	(.00095)	(.00093)
Leverage	-.00001 * *					0	-.00015 * **
	(0)					(.00002)	(.00004)
HHI × Leverage	.00009 * *						.00051 * **
	(.00004)						(.00013)
Inventory		0 *				0	0
		(0)				(0)	(0)
HHI × Inventory		0 *					0
		(0)					(0)
R&D			.00256 * **			.00302 * **	.00326 * **
			(.00072)			(.00076)	(.00103)
HHI × R&D			-.00156				-.00165
			(.00244)				(.0027)
SGA				0		0	0
				(0)		(0)	(0)
HHI × SGA				0			0
				(0)			(0)
Fixed Assets					0	0	0
					(0)	(0)	(0)
HHI × Fixes Assets					0 * **		0
					(0)		(0)
Intercept	.02873	.02865	.00248	.03148	.02865	-.00115	-.00156
	(.01838)	(.01826)	(.01202)	(.02052)	(.01893)	(.01305)	(.01161)
Random Coefficients							
Sector	-3.21988 * **	-3.22829 * **	-3.52922 * **	-3.21066 * **	-3.22436 * **	-3.62558 * **	-3.66942 * **
Firms	-4.61715 * **	-4.61281 * **	-4.52242 * **	-4.5194 * **	-4.59802 * **	-4.33904 * **	-4.34123 * **
Years	-3.81302 * **	-3.81773 * **	-3.92446 * **	-3.85245 * **	-3.81678 * **	-3.96721 * **	-3.9716 * **
Residuals	-4.73584 * **	-4.74027 * **	-4.82965 * **	-4.76452 * **	-4.73868 * **	-4.84964 * **	-4.85499 * **
Observations	11613	11748	3852	9739	11639	3200	3200
Wald Statistics	3813.3 * **	3125.4 * **	1230.2 * **	2937 * **	4698.5 * **	962.9 * **	1044.2 * **
LR Statistics	4053.7 * **	3269 * **	1303.3 * **	3594 * **	3984.1 * **	845.3 * **	859.5 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A23

HHI Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Alternative Proxies. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. HHI is the Herfindahl Index, a measure of industry concentration, calculated as the sum of squared market shares of all firms in an industry, averaged over the past three years. Leverage is the ratio of total debt to total assets. Inventory is the natural logarithm of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (HHI × Leverage, HHI × Inventory, HHI × R&D, HHI × Fixed Assets, and HHI × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (HHI), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.84692 * **	.84533 * **	.82432 * **	.82256 * **	.8456 * **	.79755 * **	.79687 * **
	(.00882)	(.00957)	(.02258)	(.01213)	(.00972)	(.02443)	(.02403)
HHI	-.00118	.0004	-.00116	-.00054	.00053	-.00339	-.00405
	(.00128)	(.00121)	(.00228)	(.00121)	(.00114)	(.00218)	(.00295)
Size	-.0014 * **	-.00142 * **	-.00168 * **	-.00175 * **	-.00147 * **	-.00223 * **	-.00227 * **
	(.00009)	(.00009)	(.00023)	(.00013)	(.00009)	(.00027)	(.00027)
PTBV	-.00001	-.00003	.00047	-.0001	-.00002	.00087 *	.00081
	(.00002)	(.00003)	(.0005)	(.00031)	(.00002)	(.00047)	(.0005)
Risk	.00026 * *	.00027 * *	-.00006	.00025 * *	.00032 * *	-.00029	-.00014
	(.00012)	(.00012)	(.00029)	(.00013)	(.00014)	(.00034)	(.00029)
Leverage	-.03496 *					.0651 *	-.11519
	(.01886)					(.03812)	(.16921)
HHI × Leverage	.60592 * *						.57123
	(.23622)						(.55919)
Inventory		.00148				.00287 * *	-.00088
		(.0014)				(.00134)	(.00544)
HHI × Inventory		-.00569					.00246
		(.0071)					(.01806)
R&D			.00095 * **			.00103 * **	.00109 * **
			(.00023)			(.00024)	(.00028)
HHI × R&D			-.0003				-.00071
			(.00085)				(.00117)
SGA				.00415 * *		.00055	.00328
				(.00165)		(.0004)	(.00264)
HHI × SGA				-.00664 * *			-.00609
				(.00325)			(.00738)
Fixed Assets					.00117	.00287 * *	.00951
					(.00111)	(.00117)	(.00683)
HHI × Fixes Assets					.00127		-.01488
					(.00252)		(.01575)
Intercept	.00465 * **	.00456 * **	.00761 * **	.00508 * **	.0046 * **	.00929 * **	.0094 * **
	(.00049)	(.0005)	(.0014)	(.00057)	(.00048)	(.00166)	(.00164)
Observations	11500	11585	3825	9595	11480	3177	3170
Wald Statistics	68979.5 * **	56561.7 * **	22889.5 * **	49028 * **	49289.6 * **	14239.2 * **	13457.1 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A24

CR3 Extended Model (Mixed Effects Linear Model) – Alternative Proxies. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR3 is the three-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to total assets. Inventory is the natural logarithm of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between

firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR3	-.04814 * **	-.04735 * **	-.0376 * **	-.04319 * **	-.04533 * **	-.02594 * **	-.02257 * *
	(.01124)	(.01118)	(.00841)	(.01298)	(.01257)	(.00872)	(.00897)
Size	.00228 * **	.00209 * **	.00062	.00141 * **	.00234 * **	-.00023	-.00039
	(.00039)	(.00033)	(.00053)	(.00029)	(.00043)	(.00061)	(.00062)
PTBV	.00039 * **	.00039 * **	.00396 * *	.00122 *	.00039 * **	.00742 * **	.00194
	(.00003)	(.00003)	(.00156)	(.00066)	(.00003)	(.00084)	(.00179)
Risk	-.0002	-.00018	-.00146	-.00054	-.00025	-.00122	-.00136
	(.00044)	(.00045)	(.00131)	(.0006)	(.00043)	(.00115)	(.00109)
Leverage	.0283					.08151	-.70299
	(.05658)					(.18118)	(.60094)
CR3 × Leverage	-.41231						2.73451
	(.74023)						(1.77216)
Inventory		.02025 * **				.01071 * *	.02888 * *
		(.00765)				(.00473)	(.01355)
CR3 × Inventory		-.098 * **					-.10846 * *
		(.03622)					(.05215)
R&D			.00098			.00392 * **	.00102
			(.00141)			(.00073)	(.0019)
CR3 × R&D			.01319 * *				.0182 * **
			(.00519)				(.00524)
SGA				.01328 * *		.00335 * *	.01074 *
				(.00576)		(.00158)	(.00605)
HHI × SGA				-.02952 *			-.02675
				(.0152)			(.02064)
Fixed Assets					.00198	-.00007	-.00207
					(.00139)	(.00301)	(.00557)
HHI × Fixes Assets					.0006		.01905
					(.00628)		(.0139)
Intercept	-.02753 * **	-.02649 * **	-.01349 * **	-.02422 * **	-.02805 * **	-.01169 * **	-.00911 *
	(.00213)	(.00191)	(.00451)	(.00153)	(.00222)	(.0036)	(.00504)
Random Coefficients							
Sector	-5.6445 * **	-5.55474 * **	-5.15509 * **	-5.61365 * **	-5.81542 * **	-7.0997 * **	-5.12481 * **
Firms	-4.43106 * **	-4.41982 * **	-4.23134 * **	-4.32113 * **	-4.40517 * **	-4.08991 * **	-4.05775 * **
Years	-3.74104 * **	-3.74931 * **	-3.86001 * **	-3.78261 * **	-3.7456 * **	-3.88926 * **	-3.91522 * **
Residuals	-4.67797 * **	-4.68448 * **	-4.76696 * **	-4.7064 * **	-4.68048	-4.78269	-4.7975 * **
Observations	11613	11748	3852	9739	11639	3200	3200
Wald Statistics	2284 * **	2617.9 * **	688.2 * **	2214.3 * **	4319.5 * **	642.9 * **	896.9 * **
LR Statistics	2289.8 * **	2410.1 * **	741.9 * **	2664.4 * **	3283.2 * **	536.3 * **	672 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A25

CR3 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Alternative Proxies. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR3 is the three-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to total assets. Inventory is the natural logarithm of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (CR3 × Leverage, CR3 × Inventory, CR3 × R&D, CR3 × Fixed Assets, and CR3 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR3), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard

instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero.The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.84775 * **	.84511 * **	.82731 * **	.82209 * **	.84794 * **	.80233 * **	.80056 * **
	(.00902)	(.00973)	(.02235)	(.01231)	(.00987)	(.02397)	(.02407)
CR3	.00031	.00048	-.0002	-.00109	.00032	-.00451	-.00318
	(.00136)	(.00137)	(.0023)	(.0016)	(.00142)	(.00318)	(.00289)
Size	-.0014 * **	-.00141 * **	-.00169 * **	-.00175 * **	-.00153 * **	-.00223 * **	-.00226 * **
	(.00009)	(.00009)	(.00022)	(.00013)	(.0001)	(.00027)	(.00027)
PTBV	-.00001	-.00003	.00042	-.00009	-.00003	.00071	.00071
	(.00002)	(.00003)	(.00051)	(.00031)	(.00003)	(.00047)	(.00051)
Risk	.00026 * *	.00027 * *	-.00005	.00025 * *	.00027 * *	-.00024	-.00018
	(.00012)	(.00012)	(.00029)	(.00012)	(.00013)	(.00032)	(.0003)
Leverage	-.03138 *					.05949 *	-.08334
	(.01784)					(.03529)	(.16742)
CR3 × Leverage	.55747 * *						.43977
	(.21937)						(.54408)
Inventory		.0014				.00266 *	-.00036
		(.00143)				(.00143)	(.0052)
CR3 × Inventory		-.00527					.0013
		(.00728)					(.01691)
R&D			.00098 * **			.001 * **	.00095 * **
			(.00022)			(.00024)	(.00027)
CR3 × R&D			-.00021				.00005
			(.00073)				(.00093)
SGA				.00414 * *		.00059	.00382
				(.00169)		(.00045)	(.00278)
CR3 × SGA				-.00667 *			-.00829
				(.00357)			(.00816)
Fixed Assets					.00175	.003 * *	.00787
					(.00145)	(.00136)	(.00705)
CR3 × Fixes Assets					.00004		-.01015
					(.00309)		(.01677)
Intercept	.00452 * **	.00459 * **	.00769 * **	.00502 * **	.00509 * **	.00892 * **	.00886 * **
	(.00046)	(.00049)	(.00144)	(.00056)	(.00049)	(.00165)	(.00163)
Observations	11500	11585	3825	9595	11480	3177	3170
Wald Statistics	71980 * **	55563.2 * **	25873 * **	50239.6 * **	48237 * **	14062 * **	13246.5 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A26

CR5 Extended Model (Mixed Effects Linear Model) – Alternative Proxies. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. CR5 is the five-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to total assets. Inventory is the natural logarithm of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Sector, Firms, and Years represent the random effects for sectors, firms, and years, respectively. Residuals represent the remaining unexplained variation in stock returns after accounting for the fixed and random effects. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. Robust standard errors are not reported in the table but are available upon request. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero. The LR test compares the goodness of fit between a random-effects model and a simpler linear model. It assesses whether adding random effects significantly improves the model fit. The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fixed Effect Part							
CR5	-.04651 * **	-.04551 * **	-.02971 * **	-.04201 * **	-.04437 * **	-.02021 * **	-.0171 * *
	(.01279)	(.01275)	(.01092)	(.01427)	(.01356)	(.00759)	(.0085)
Size	.00221 * **	.00203 * **	.00056	.00137 * **	.00227 * **	-.00025	-.0004
	(.0004)	(.00034)	(.00049)	(.00028)	(.00044)	(.00059)	(.00061)
PTBV	.00038 * **	.00038 * **	.00293 * *	.00107 *	.00038 * **	.00669 * **	.00137
	(.00003)	(.00003)	(.00139)	(.00059)	(.00003)	(.0009)	(.00169)
Risk	-.00023	-.00021	-.00144	-.00056	-.00028	-.00121	-.00135

(*continued on next page*)

Table A26 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(.00046)	(.00047)	(.00138)	(.00064)	(.00045)	(.00119)	(.00113)
Leverage	.02044					.08559	-.74831
	(.0566)					(.17906)	(.581)
CR5 × Leverage	-.31972						2.90474 *
	(.73367)						(1.72688)
Inventory		.01967 * **				.00967 * *	.02838 * *
		(.00757)				(.00482)	(.01251)
CR5 × Inventory		-.09548 * **					-.10906 * *
		(.03593)					(.04754)
R&D			.00113			.00397 * **	.00111
			(.0014)			(.00074)	(.0019)
CR5 × R&D			.01293 * *				.01787 * **
			(.00519)				(.00531)
SGA				.01282 * *		.00347 * *	.01061 *
				(.00561)		(.0015)	(.006)
CR5 × SGA				-.02837 *			-.02611
				(.01472)			(.02008)
Fixed Assets					.00163	.00051	-.00202
					(.00113)	(.00267)	(.00536)
CR5 × Fixes Assets					.00076		.02027
					(.00545)		(.0141)
Intercept	-.02559 * **	-.02463 * **	-.01235 * **	-.02262 * **	-.02606 * **	-.01106 * **	-.00875 *
	(.0022)	(.00209)	(.00464)	(.00183)	(.00233)	(.00367)	(.00527)
Random Coefficients							
Sector	-5.41074 * **	-5.34262 * **	-5.11483 * **	-5.42803 * **	-5.51325 * **	-6.99096 * **	-5.12692 * **
Firms	-4.45467 * **	-4.44331 * **	-4.22672 * **	-4.3425 * **	-4.43179 * **	-4.0877 * **	-4.05664 * **
Years	-3.74736 * **	-3.75519 * **	-3.86232 * **	-3.78786 * **	-3.7515 * **	-3.89089 * **	-3.91606 * **
Residuals	-4.68504 * **	-4.69115 * **	-4.76814 * **	-4.71257 * **	-4.68737 * **	-4.7834	-4.79769 * **
Observations	11613	11748	3852	9739	11639	3200	3200
Wald Statistics	2432.5 * **	2695 * **	709.6 * **	2272.4 * **	4411.8 * **	648.2 * **	896.9 * **
LR Statistics	2317.7 * **	2400.3 * **	777 * **	2638.2 * **	3260.8 * **	551.1 * **	692.5 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A27

CR5 Extended Model (Dynamic Panel Model, Arrellano- Bond Estimator) – Alternative Proxies. The table presents seven model specifications, with each column focusing on a different combination of firm-specific variables and their interactions with industry concentration. The dependent variable is the monthly stock returns in excess of the risk-free rate, averaged over a period of 12 months. Lagged returns represent the first lag of the dependent variable, included as an explanatory variable to capture the dynamic nature of stock returns. CR5 is the five-firm concentration ratios, representing the combined market share of the three and five largest firms in an industry, respectively. Size is the natural logarithm of total assets, used as a proxy for firm size. Leverage is the ratio of total debt to total assets. Inventory is the natural logarithm of the ratio of inventory to sales. R&D is the natural logarithm of the ratio of research and development expenses to sales. Fixed Assets is the natural logarithm of the ratio of new plant and equipment to total fixed assets. SGA is the natural logarithm of the ratio of selling, general, and administrative expenses to sales. The interaction terms (CR5 × Leverage, CR5 × Inventory, CR5 × R&D, CR5 × Fixed Assets, and CR5 × SGA) capture the moderating effect of industry concentration on the relationship between firm-specific variables and stock returns. Intercept represents the average stock returns when all explanatory variables are zero. Observations indicate the number of firm-year observations used in each model specification. Firms Effect, Year Effect, and Sector Effect indicate that the models control for unobserved heterogeneity across firms, years, and sectors, respectively. The models are estimated using the two-step GMM estimator, which is more efficient than the one-step estimator in the presence of heteroskedasticity and autocorrelation. Robust standard errors are reported in parentheses to account for potential heteroskedasticity and clustering of observations within firms. The third and fourth lags of the lagged returns are used as GMM-type instruments to address potential endogeneity in the dynamic model. The industry concentration measures (CR5), firm-specific variables (Size, Leverage, Inventory, R&D, Fixed Assets, and SGA), and their interactions are treated as exogenous and used as standard instruments in the IV-style estimation. The Wald test assesses the significance of coefficients in a regression model. It tests the null hypothesis that all the slopes are zero.The asterisks * , * *, and * ** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged returns	.843 * **	.84113 * **	.81251 * **	.81714 * **	.84206 * **	.79283 * **	.79055 * **
	(.00907)	(.00978)	(.02145)	(.01233)	(.00999)	(.02278)	(.02354)
CR5	-.00327 * **	-.00309 * **	-.00741 * **	-.00486 * **	-.00346 * **	-.00817 * **	-.00777 * **
	(.00112)	(.00113)	(.00167)	(.00128)	(.00117)	(.00157)	(.00179)
Size	-.00137 * **	-.00138 * **	-.00168 * **	-.00173 * **	-.0015 * **	-.00214 * **	-.00221 * **
	(.00009)	(.00009)	(.00023)	(.00012)	(.0001)	(.00028)	(.00027)
PTBV	-.00001	-.00004	.00058	-.00012	-.00003	.00085 * *	.00078 *
	(.00002)	(.00003)	(.00047)	(.00032)	(.00003)	(.0004)	(.00043)
Risk	.00029 * *	.00029 * *	.00002	.00026 * *	.00029 * *	-.00016	-.00012

(*continued on next page*)

Table A27 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(.00013)	(.00013)	(.00027)	(.00012)	(.00013)	(.00029)	(.00028)
Leverage	-.03253					.05746 * *	-.19785
	(.02112)					(.02755)	(.17642)
CR5 × Leverage	.56363 * *						.82623
	(.26832)						(.59019)
Inventory		.00112				.00229 *	-.00248
		(.00131)				(.00127)	(.00517)
CR5 × Inventory		-.00352					.00867
		(.0068)					(.01709)
R&D			.00108 * **			.00093 * **	.00099 * **
			(.00022)			(.00025)	(.00027)
CR5 × R&D			-.00054				-.00048
			(.00076)				(.00097)
CR5 × R&D				.00388 * *		.00058	.00389
				(.00167)		(.00038)	(.00283)
SGA				-.00561 *			-.00843
				(.00339)			(.00841)
CR5 × SGA					.00149	.00319 * **	.00897
					(.0013)	(.0012)	(.00748)
Fixed Assets					.0009		-.01192
					(.00282)		(.01799)
Intercept	.00452 * **	.00461 * **	.00783 * **	.00507 * **	.00506 * **	.00857 * **	.00888 * **
	(.00047)	(.00048)	(.00143)	(.00056)	(.00049)	(.00171)	(.00164)
Observations	11500	11585	3825	9595	11480	3177	3170
Wald Statistics	66989.5 * **	53086.5 * **	25306.6 * **	47986.6 * **	45992.6 * **	14023.4 * **	12999.4 * **
Firms Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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