

**Revisiting the Firm, Industry and Country Effects on Profitability under Recessionary and
Expansion Periods: A Multi-level Analysis**

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Running Head: Firm, Industry and Country Effects on Profitability

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Abstract

Despite voluminous past research, the relevance of firm, industry and country effects on profitability, particularly under adverse contexts, is still unclear. We reconcile institutional theory with the resource based view and industrial organization economics to investigate the affects of economic adversity, such as the 2008 global economic crisis. Using a 3-Level random coefficient model, we examine 15,008 firms across 10 emerging and 10 developed countries for the 2005-2011 period. We find that firm effects become stronger under adversity whereas industry effects become weaker, as well as country main and interaction effects, particularly among the emerging economies. These findings confirm our assumptions that the firm's own fate is, to a great extent, self-determined, a reality that is even more pronounced during periods of extreme economic hardship.

Keywords: Firm effects, Financial Crisis, Markets and Institutions, Emerging Economies, Hierarchical Linear Modelling

Revisiting the Firm, Industry and Country Effects on Profitability under Recessionary and Expansion Periods: A Multi-level Analysis

One of the most celebrated debates in strategic management research has been the relative importance of firm versus industry and country effects on firm profitability. After decades of research, we know that while industry-specific (Bain, 1951; Porter, 1980) and country-specific factors (Makino *et al.*, 2004, Tong *et al.*, 2008) are always present, firm-specific effects on profitability are more pronounced (Hawawini, Subramanian & Verdin, 2003, McGahan & Porter, 2002, Short *et al.*, 2007). However, despite considerable research in this area, we have yet to establish the relevance of firm, industry, and country effects on performance during varying economic conditions. In particular, we lack empirical studies of global recessions on the firm–industry–country effects on firm performance.

In the present study, we bridge this gap in the literature by examining the relationship between firm, industry, country effects and firm profitability immediately before *and* after the 2008 global financial crisis. Recessions have been particularly and directly linked to poor firm performance (Greenwald & Stiglitz, 1988, Richardson, Kane & Lobingier, 1998). In addition, a plethora of evidence suggests that the 2008 crisis has had considerable direct and indirect influence on the formal institutions, even creating certain path dependencies for further institutional changes (Schwarzer, 2012). Using neo-institutional economics as our main theoretical pillar, we posit that a global economic shock, such as the 2008 recession, can bring about seismic effects to the institutional environment and markedly alter both the formal and informal ‘rules of the game’ (Butter, 2012, Chakrabarti, Singh & Mahmood, 2007, Schwarzer, 2012) and, consequently, the role of the firm, industry and country effects on performance.

The present study advances our knowledge in four distinct ways. First, the examination of the firm, industry and country effects during a period of economic munificence (2005–2007) and during a remarkable period of global economic recession (2008–2011) offers new insights on the power of economic cycles in shifting long established paradigms. Drawing from three well-established

theoretical pillars in the strategic management literature — resource-based view, industrial organisation economics, and institutional theory — we develop and test hypotheses on how the impact of the firm, industry and country effects on firm profitability is altered during these two contrasting periods. Second, in addition to examining main effects of firm, industry and country, we also investigate country–industry interaction effects, and further enhance our understanding of the joint effects of country and industry.

Third, we conduct this investigation in a setting with ten leading developed economies and ten emerging economies, while accounting for industry variations. This setting offers unique insights for the overall impact of the global recession and allows for higher generalizability and validity of the study findings. Finally, in assessing the variance accounting for each effect (firm, industry, country and country–industry interaction) we employ a novel technique — multi–level random coefficient modelling (Short *et al.*, 2007).

The remainder of this article is organized as follows. First, the theoretical background and hypothesis development is explored. Next, the database and methodology are described, followed by the empirical results, and a series of robustness tests in several subsets of the sample (year, stage of development, per–country analysis). We then offer a discussion of key results and contributions to theory. Concluding remarks, discussion of special cases, and managerial and theoretical implications for future development are provided in the final section.

THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Economic rents generation has always been at the forefront of strategic management research. How firms achieve competitive advantage and thus superior performance remains an issue which has not been fully addressed. Varying perspectives provide their own points of view and justifications, some converging to a common rationalization, whereas others diverging miles apart, particularly when the role of an adverse context (such as a recessionary period) is blended into the discourse.

The resource based view and firm performance

From a resource-based view, the consensus has always been that a firm's ability to achieve competitive advantage and thus persistent above normal rents is dependable upon two pillars:

- (a) The firm's ability to accumulate idiosyncratic, valuable and difficult-to-copy resources, providing the firm with a distinctive advantage against the general market competition (Barney, 1991, Conner, 1991, Wernerfelt, 1984)
- (b) The firm's ability to blend the idiosyncratic, valuable and difficult-to-copy resources into unique firm-specific capabilities and competencies (Ketchen, Hult, and Slater, 2007; Prahalad & Hamel, 1990).

In essence, firm heterogeneity originates from managerial decisions that delineate idiosyncratic, valuable and difficult-to-copy resources. These decisions are typically based on rational managerial choices, prompted by economic rationality, efficiency and effectiveness drivers, as well as by external influences (Oliver, 1997). Yet, competitive advantage can only be retained for as long as the uniqueness of these resources is sustained in the market. Thus long-term firm heterogeneity and sustainable rents have been attributed to a firm's ability to uniquely blend the acquired resources into firm-specific capabilities and core competencies (Prahalad & Hamel, 1990; Conner, 1991).

Associated with historical conditions, organizational culture and norms, a firm's core competencies generate a causal ambiguity and social complexity within the organization. These competences are too difficult to be duplicated in a different setting and, as such, be exploited by competition (Wright, McMahan & McWilliams, 1994).

While the resource-based view has been instrumental in deciphering the firm heterogeneity conundrum, it has largely overlooked the formal and informal institutional context and its influences on strategic choice (Oliver, 1997, Peng, Wang & Jiang, 2008). Within the premise of the resource-based view the institutional environment has always been in the background, implicitly assumed to be relatively stable, unchanged and irrelevant to firm heterogeneity (Peng *et al.*, 2008). If the institutional environment can be safely assumed to be constant, and thus 'taken for granted', then mainstream

theories, which ignore the relationship of the organization with its environment, can be applied without issues. Indeed as McMillan (2007) points out, under smooth market conditions in developed economies, the role of the institutions is almost invisible. However, the same cannot be argued for poorly performing institutions, where adjustments to mainstream management theories are often deemed necessary to account for the ‘context’ of the organization (Peng *et al.*, 2008). Since the resource-based view cannot in itself predict firm behavior in shifting institutional paradigms, we turn to the domain of institutional economics, which offers a complementary viewpoint.

Neo-institutionalism and firm performance

Institutional theory concentrates on how firms operate within a certain social system. Every social system is built on a set of specific assumptions, rules and norms, binding its members to certain socially accepted and expected actions. Hence, institutions comprise all the formal (constitutions, legislation, treaties, court rulings, standards) and informal (shared norms, trust, customs and traditions, codes of conduct and social conventions) ‘rules of the game’, which structure economic, political and social interactions within a system (North, 1990). By reducing transaction and information costs, institutions aim at mitigating uncertainty, reducing information asymmetry, adverse selection and moral hazard problems, while developing structures and conditions which are encouraging for economic interactions (Hoskisson *et al.*, 2000). In the meantime, and along with the regular constraints of economics (North, 1991), institutions tend to shape the strategic choices and decision-making processes of organizations. Hence, an institution-based view of strategy posits that strategic choices result from a three-way interaction of firm-specific resources, industry conditions, and the formal and informal constraints of the institutional environment (Peng, 2003, Peng *et al.*, 2008).

Obviously, firm performance might be rather constrained by these rules, as well as the technological, informational and income limits of the context (Oliver, 1997). Yet, firms that conform to the social norms and the ‘acceptable firm conduct’ can easily gain the necessary legitimacy, and thus the resources and capabilities required for their survival and sustainable development.

Homogeneity (*isomorphism*) is the key for sustainable growth and performance. In this respect, firm

behavior is not dependent upon rational and economically justifiable managerial decisions, but upon compliance, habitual and socially defined choices (Scott, 1987). The more acceptable a firm presents itself within its environment, the more successful it will be by gaining the necessary legitimacy from its peers.

The impact of the 2008–2010 crisis on the institutional environment

It is clear that the rise of new institutionalism and the development of the institution-based view of strategy place particular focus on institutional transitions, and the importance of the changing ‘rules of the game.’ The 2008 global financial crisis provides an excellent case for investigation of such a transition. Not only did it cause a systemic contagion, affecting most countries globally, but it also left firms, industries and countries vulnerable to a host of adverse events and risks. During the crisis of 2008–10, as Butter (2012: 127) points out, the general environment of mutual trust (as in the U.S., prior to the housing crisis, and in the EU prior to the sovereign debt crisis) quickly transformed to one of mutual distrust, leading to severe credit deficits and illiquidity. The result was a sharp increase in transaction costs with a contemporaneous decline in firm resources (Latham & Braun, 2008, Pearce II & Michael, 1997). Such shortage of resources quickly lead to decline of productivity and competitiveness, job and wage cuts, reduced efficiency, lower profit margins, and in several cases, default (Richardson *et al.*, 1998). The above evidence confirms that a global crisis, such as the 2008–10 financial recession, seriously question the conventional assumptions of institutionalism.

Furthermore, the 2008 crisis has had considerable direct and indirect influence on the formal institutions of several countries. For example, the U.S. responded to the crisis initially with the ‘operation twist’ (purchase of short-term and the sale of long-term bonds), followed by a series of rather unconventional ‘quantitative easing’ programs. Similar responses were implemented by the UK and Japan. In the EU, the pressure of sovereign debt crisis brought about implicit as well as explicit institutional changes during 2009–11, primarily in the form of crisis management and ad hoc policy-making. As Schwarzer (2012) points out, such crisis management decisions were not only examples of incremental institutional evolution, but also created path dependencies for further institutional

changes. Such interventions can be said to considerably alter the ‘rules of the game,’ and were received with criticism from within and outside of these economies.

It is clear that, even in developed economies, a global economic shock, such as the 2008 recession, can bring about seismic effects to the institutional environment and markedly change both the formal and informal rules of the game for market participants.

Reconciling the resource-based view with institutional theory

Although, social conformity is necessary for legitimacy and social approval, it can also lead to rigidity, impassiveness, resistance to change, and cognitive sunk costs (Oliver, 1997). These outcomes can be detrimental to the performance of firms, particularly under conditions of economic shocks. As Garcia-Sanchez, Mesquita and Vassolo (2014) proposed, economic shocks act as a natural cleansing mechanism of the markets from firms that are not well prepared to withstand changes in the competitive environment. Those firms that perform well during the shocks typically exhibit high productivity levels, technological dexterity, and enjoy high levels of learning as well as cost-efficiency within their markets. Overall, severe environmental shocks generate strong economic and normative motives compelling even the more traditional firms to review their strategic choices, restructure their assets and re-align their resources to attain the dexterity and flexibility required for their survival (Oliver, 1997).

In addition, in turbulent economic periods, where the ‘rules of the game’ are changing, strategic factor markets are also more likely to be imperfect. The shifting institutional environment and the increased uncertainty generate differing expectations about the true value of strategic factors (Barney, 1986). As Greenwald and Stiglitz (1988) and Bernanke and Gertler (1989) argued, financial crises, coupled with sharp stock market declines, increase adverse selection and moral hazard problems, jeopardizing firms’ market value. In the absence of safe collaterals, lenders become particularly unwilling to provide funds, whereas the heightened risks of a prolonged recession, political instability, and (one or more) major corporate failures make it impossible for the providers of capital to tackle the adverse selection problem. Under these conditions, resources may become unevenly distributed across competitors, leading to differing rent potential and heterogeneity, with firm-specific effects

accounting even more for performance variations. Indeed, Garcia–Sanchez *et al.* (2014) revealed that during severe economic shocks firm’s financial flexibility becomes particularly important for its performance. Such flexibility allows firms to cover their operational costs and also exploit growth opportunities when presented.

Within the firm vs. industry effects debate, many studies incorporated ‘year effects,’ to control for the influence of potential systematic shifts in the economy. However, none of these studies made an explicit distinction between economic expansion and recession. There is no empirical work within the strategic management literature that offers reasonable expectations of the 2008 recession consequences on the firm effects – performance relationship. Taking the two theoretical approaches together (resource based view and institutional theory), we predict:

Hypothesis 1: Firm effects will be stronger in recessionary economic periods as compared to expansionary periods

The industry based view and firm performance

In contrast to the resource–based view, industrial organization economics or the so–called ‘industry–based view’ of the firm, provides an alternative explanation. Resonating in Chamberlin’s work as outlined in the *Theory of Monopolistic Competition* (1948), and validated through the structure–conduct–performance paradigm as introduced by Bain in the 1950s (Bain, 1951, 1954), the industry based view of the firm emphasized the importance of market structure in shaping firm profitability. In fact, a linear relationship is proposed between market structure and firm conduct, with a direct effect on overall firm performance.

According to the industry–based view of the firm, firms are seen as integral parts of an industry. Industries with distinct market structures, and market conduct and performance tend to differ significantly (Bain, 1951: 29). The industry structure is obviously exogenous, influenced by internal competitive forces. These include: the number and size of competitors (market concentration), the competitive rivalry, the degree of product differentiation, the ease of entry and exit, market

information accessibility, and set-up costs of the already established firms (Bain, 1950, 1951, 1954). Any difference in profitability among firms in the same industry is a matter of the firms' positioning against their counterparts within the industry (Porter, 1980, Schmalensee, 1985).

The literature has focused largely on the association between industry structure features and performance (cf. Morgenson, Mithas, Keiningham, and Aksoy 2011). Such features as market concentration, barriers to entry, and firm size, as well as such non-structural elements as the industry growth rate have received particular attention (Bain, 1951, Gale, 1972, Mann, 1966, Shepherd, 1972). Despite the rich theoretical discourse, the empirical evidence directly linking industry-effects to firm profitability is rather inconclusive (Conner, 1991). Only since researchers have begun to employ analysis of variance frameworks, examination of the relative importance of industry-specific effects became possible (Schmalensee, 1985).

Indeed, this new stream of research revealed that industry effects, although not predominantly, are important in shaping firm profitability, and account for as much as 23.5 percent of total variance in firm profitability (Short *et al.*, 2009). Direct associations were further revealed between elements of market structure (i.e. industry maturity, entry barriers and competitive power) and performance (Powell, 1996), as well as between market structure and core strategic choices, such as R&D and advertising strategies (Mauri & Michaels, 1998)¹. Furthermore, the importance of industry-effects was particularly heightened when smaller firms were included in the analysis. In such cases, industry effects were not only much higher (accounting for up to 54.2 percent of the total variance) but overpowered even the firm effects (Chang & Singh, 2000), corroborating the importance of firm size.

Reconciling the industry-based view with institutional theory

Similar to the resource-based view, the industry-based view has also received criticism for taking institutions for granted. Despite Bain's (1951) emphasis on institutional linkages, there has been limited attention to the role of the environment, and how it may affect the industry structure – performance relationship.

¹ Mauri & Michaels, 1998 revealed that market structure had a direct impact on core strategic choices, such as R&D and advertising strategies, accounting for 55.4 percent and 68.2 percent respectively of the sample variance in either strategy.

A noteworthy exception is the literature on industry cycles and their impact on industry and firm performance. Industry growth cycles are characterized by rapid structural changes, a constant increase of the competitive field with new entrants, and severe demand fluctuations. High firm heterogeneity and high product variation is to be expected at this stage. Therefore, the importance of firm-effects on firm performance is inevitably stronger at the expense of industry-effects (Karniouchina *et al.*, 2013). As an industry evolves towards maturity, the focus shifts towards more ‘routinized practices’ that can facilitate efficiency improvements throughout the entire supply chain of the firm. At this stage, the competitive field is settled, the ineffective players are discarded, change is reduced, and industry output gets stabilized (Garcia-Sanchez *et al.*, 2014, Karniouchina *et al.*, 2013). In general, as Karniouchina *et al.*, (2013) also showed, when moving from industry growth to maturity and decline, industry effects explain more variance in firm performance.

However, the above findings cannot be generalized to recessionary periods, since industrial cycles differ fundamentally from economic ones. First, industrial cycles are ‘endogenous uncertainties,’ cyclical by nature, and to some extent predictable (Garcia-Sanchez *et al.*, 2014). In contrast, economic recessions, being ‘exogenous uncertainties,’ are sudden and more violent in nature, with unpredictable, uncontrollable and less uniform periodicity and breadth (Mascarenhas & Aaker, 1989). In this case, it comes down to how well prepared a firm is to overcome the effects of such unpredictable events.

Second, although some of the characteristics of an economy in recession resemble a declining industrial environment (e.g., reduced resources, limited capital availability, stale demand), these are exogenously imposed, and do not reflect endogenous industry problems. The decline stage of an industry, typically suggests its demise, instigated by such factors as technological obsolescence, sociological, and demographical changes (Harrigan, 1980a). However in a recession, the declining demand is simply a symptom of temporary contraction. Industry-effects are not to be blamed for the performance of the firms, but rather the strategic choices the latter make. Indeed, whereas divestment, retrenchment and exit are among the strategies proposed to offset declining industries (Chakrabarti *et*

al., 2007, Harrigan, 1980b), the most successful strategies for countering recessions are innovation, new product development, and customization (Garcia–Sanchez *et al.*, 2014, Geroski & Gregg, 1997).

Finally, whereas recessions might have a more prolonged impact on the economy and influence many industries simultaneously, not all industries will be in decline. In fact, during the 2008 economic downturn, some industries remained almost impervious to the negative jolts of the economy (i.e. health care, pharmaceuticals, consumer staples), whereas – even more interestingly – some others emerged and grew mainly due to the economic situation (i.e. pawnbrokers) (Jiang, Koller & Williams., 2009).

From the above discussion it is clear that we cannot generalize findings from the industry lifecycle literature to recessionary periods, because industrial cycles differ fundamentally from economic ones. In addition, as Garcia–Sanchez *et al.*, (2014) posit, the effect of the economic cycle on industry lifecycle is conditional on the stage of the later. Therefore, and while Karniouchina *et al.*, (2013) found that industry effects are stronger during an industry in decline, this finding can be conditional to the general economic conditions. We in fact posit a different direction of the relationship during an economic downturn. Strong economic shocks alter formal and informal institutions, and disrupt the status quo in industries, bringing about new structural dynamics, which affect both the internal competitive forces and demand. Such disruptive environmental conditions compel individual industry participants to deviate from uniform strategic responses, and employ diverging strategic choices, weakening the impact of industry–effects. Indeed, Majumdar and Bhattacharjee (2014) found that manufacturing firms exhibited weaker industry–effects during the Indian institutional transition towards liberalization. Their findings indicate that during uncertain times, when the ‘rules of the game’ are shifting, there is a greater need for firm–specific strategies in managing the complexity of the changing environment, rather than for conformity to the industry norms. Therefore, we expect that industry–effects will be weaker during an economic decline, and hypothesize:

Hypothesis 2: Industry effects will be weaker in recessionary economic periods as compared to expansionary periods.

Country effects and firm performance in the emerging economy context

Despite the general contention that country effects should diminish, due to globalization and harmonization of tastes, technologies, and institutions (e.g., Levitt, 1983, Yip and Hult, 2012), recent studies in international business, international economics, and finance increasingly provide contrary evidence. In fact, studies demonstrate that, despite the globalization phenomenon, integration among markets is not fully achieved due to exchange rate risks and tariffs, cultural barriers, and personal biases of the home country investors (Hawawini, Subramanian & Verdin, 2004). Indeed, country-specific factors, such as the size of the country, the institutional framework, legal, government and political differences, and the utilization of the production factors and technology, can seriously affect firm strategy and consequently firm profitability (Makino *et al.*, 2004, Tong *et al.*, 2008).

Country differences become even more magnified when contrasting countries at different stages of economic development, such as emerging vs. advanced economies (Peng, 2008). Emerging economies possess unique characteristics facilitating rapid growth and modernization (Cavusgil and Cavusgil, 2012). However, they also pose a wide range of risks and challenges for foreign companies. Specifically, emerging economies are characterized by market imperfections, such as asymmetric dissemination of production factors across all actors (Ghemawat & Khanna, 1998); limited access to external finance or lack of financial intermediaries (Khanna & Palepu, 2000); and insufficient market supporting mechanisms and other policy distortions (e.g. high levels of corruption) (Khanna & Rivkin, 2001). These imperfections, combined with the existence of powerful family conglomerates² that dominate the trade within³, make these institutional environments rather unique (Tong *et al.*, 2008).

The differences between emerging and developed economies are so profound that it can only result in unequal growth opportunities for firms (Peng, 2003, Tong *et al.*, 2008; Majumdar & Bhattacharjee, 2014). Indeed, Diaz-Hermelo and Vassolo (2010) proposed that persistent superior economic performance is more difficult for firms in emerging economies. The highly unstable

² Some examples are: the *chaebols* in S. Korea, the *business houses* in India, the *grupos* in Latin America, the *holding companies* in Turkey.

³ In Turkey, for example, the Koc Group accounts for about 20% of trading on the Istanbul Stock Exchange.

environment erodes the value of any successful strategy, preventing firms from retaining their competitive advantage for long. As the institutional context matures, however, the emphasis from institutional-based strategies shifts to resource-based strategies, reducing the impact of the country effects on firm performance.

Empirical evidence provides strong support to the above premise. For example, Makino, *et al.* (2004) find that country effects in less developed economies account for higher variance in profitability (7.7 percent) than in the case of developed economies (3.6 percent). Similarly, McGahan and Victor (2010) demonstrate that in low income countries, country effects explain up to 4.6 percent of the total variance in profitability, but decrease to a mere 1.7 percent in countries with the highest income.

Exploring the country effect in emerging economies during recession and expansion

It is evident from the above that the case of emerging economies requires special examination. Since extant empirical research has clearly established that the country effects in emerging economies are significantly stronger than in developed economies, we test for the impact of recessions on the country-effect – performance relationship but in the context of emerging economies alone.

Interestingly, there are no prior contentions regarding the role of the economic environment on the country-effect – performance relationship. In the empirical literature, the effect of the general economic environment has been only measured as an interaction term, the country-year effect, which has been linked to the transient effects related to specific economic factors that are captured by the year effect in each country (Hawawini, *et al.*, 2004). Yet, these effects are negligible – if not insignificant – leading us to believe that year effects or country-year effects do not really impact firm performance.

A noteworthy exception is the work of Chakrabarti, *et al.* (2007) who examined the strategy-firm performance relationship in emerging economies, and how it is influenced by an economy-wide shock. They note that in emerging economies, informal – ‘internal markets’ – are often shaped to cover for the weaknesses of the unsophisticated financial and institutional mechanisms in these

economies (Khanna & Rivkin, 2001). The internal markets offer several benefits (i.e. easier access into privileged assets and know-how, internal transfer of financial and information resources, licenses etc.), which when properly exploited, enable firms to achieve higher profitability.

However, during periods of economic contraction, the benefits bestowed by the ‘internal markets’ diminish significantly. The general reduction in capital accessibility and liquidity within the economy, the rising uncertainty, and the increasing transaction and information costs associated with wide-economic shocks not only impact on the external markets, but also on the efficacy of the internal ones. In such conditions, firms tend to revert back on their idiosyncratic competencies and strategies, rather than being reliant on informal markets and affiliations (Chakrabarti, *et al.*, 2007). Indeed, Majumdar and Bhattacharjee (2014) showed that the contestable climate of institutions in transition inspire idiosyncratic capability development, and new firm strategic initiatives.

Taking the above into consideration, we posit that country-specific factors in emerging economies have asymmetric effects on firm performance between expansion and recession. We specifically predict that:

Hypothesis 3: Country effects in Emerging Economies will be weaker during recessionary economic periods as compared to expansionary periods.

Exploring the country–industry effects during recessions and expansions

In an attempt to decipher the role of the country effects on firm performance, the country–industry interaction has also received considerable attention. Acknowledging that specific country advantages are directly associated with resources, attributes and/or expertise a country shares in certain industries (e.g. IT expertise in India, automobile industry expertise in Japan etc.) (Porter, 1980, Tong *et al.*, 2008), the country–industry interaction becomes meaningful. Makino, et al. (2004) suggest that industry is context–dependent. They argue that there are significant cross–country variations among similar industries due to differences in the factors of production (land, labor, and capital), and the level of their utilization (theory of comparative advantage). Not only prices vary among the same factors of production, but also relative production costs differ across countries. As Porter (1990) has

long contended, countries do not only differ in terms of their resource endowments, but also provide unique competitive capabilities for indigenous firms. Heterogeneity among firms across countries can be attributed to how firms align and develop unique dynamic capabilities in their respective industries.

The empirical evidence on the country–industry interaction effects is rather interesting. Most studies have showed that the interaction effects account for higher variance than the main effects of country and industry (Goldszmidt *et al.*, 2011, McGahan & Vicker, 2010, Tong *et al.*, 2008). They also vary considerably among industries (e.g. from 11.7 percent in construction to 45 percent in transportation). In some cases, the joint effects of country and industry have been reported to cannibalize the main firm–effects (McGahan & Vicker, 2010). Yet the question still remains as to how country–industry effects behave in varying economic conditions — specifically during recessionary and expansionary periods. Having hypothesized that both industry and country specific effects will diminish during recessionary periods, we expect that the joint country–industry effects will be further weakened during recession.

During periods of economic stability, it is likely that certain industries within a country may be seen as instrumental or of high priority by respective governments. Hence, the institutional context will be particularly munificent and encouraging, supportive of these country–specific industries, and intensifying the country–industry effects. However, in times of economic shocks, such as recessions, it is natural that the level of institutional support even for these country–specific industries may be reduced in light of increased uncertainty, illiquidity, and capital deficits. In addition, the general adverse conditions and shifts in demand during a recession may constrain the industry advantages across specific countries. For example, once the global demand for automobiles drops, the advantages of the auto–industry in Japan will be diluted. Generally, such a shift will further increase the competitive conditions, forcing firms to adopt resource–based strategies to achieve heterogeneity, and reduce country–industry effects on firm performance. Therefore:

Hypothesis 4: The country–industry effects will be weaker during recessionary economic periods as compared to expansionary periods.

DATA AND METHODS

Dataset

The dataset for this study is derived from Thomson ONE Banker, which includes over 60,000 active publicly listed companies during the period under examination (2005–2011). We retrieved data for all companies listed in the main exchanges for 10 emerging and 10 developed countries⁴. The emerging countries in our sample include Brazil (BRA), China (CHN), Indonesia (IDN), India (IND), South Korea (KOR), Mexico (MEX), Philippines (PHL), Poland (POL), Turkey (TUR) and South Africa (ZAF). The developed countries sampled include Australia (AUS), Canada (CAN), Switzerland (CHE) Germany (DEU), United Kingdom (GBR), Japan (JPN), Netherlands (NDL), Norway (NOR) Sweden (SWE) and the United States (USA).

The final dataset (see Table A1–1 in Appendix 1), comprises data on 15,008 firms, for the period 2005–2011, resulting in 105,056 firm–year observations. The firms in our sample are from 779 SIC4 and 60 SIC2 industries, and fall under the following eight main industry sectors: SIC2 10–14: *Mining*, SIC2 15–17: *Construction*, SIC2 20–39: *Manufacturing*, SIC2 40–49: *Transportation & Public Utilities*, SIC2 50–51: *Wholesale Trade*, SIC2 52–59: *Retail Trade*, SIC2 60–67: *Finance, Insurance, Real Estate* and SIC2 70–89: *Services*.

Model estimation

The multilevel framework of firm, industry and country effects is tested using hierarchical linear multilevel (HLM) modelling (Raudenbush *et al.*, 2004, Stewart *et al.*, 1998). HLM and structural variance decomposition studies have been used in a variety of strategic management studies (Bou and Satorra 2007, 2010; Short *et al.*, 2007). The technique is particularly appropriate for this study

⁴ For the selection of the ten developed countries we used the Human Development Index (HDI) 2011, a statistical measure that represents the level of development of a country in both economic and social terms (<http://hdr.undp.org/en/statistics/hdi/>). According to the HDI, among the ten most developed countries, Ireland and Liechtenstein are also included; however due to the financial problems the former is facing and the very small size of the latter, we excluded these two cases and added instead the next two countries in line, Switzerland and Japan. For the emerging countries, our primary goal was to select those with the strongest capital markets so as to be able to draw reliable financial information (ROA). Hence we used the Dow Jones Index (DJI), which classifies the markets with respect to three criteria: a) market and regulatory structure, b) trading environment, and c) operational efficiency. 21 countries are defined by DJI as emerging in four regions (America, Asia/Pacific, Europe, Africa). We selected a sample of all regions.

because of the hierarchical nature of the data (i.e., firms nested in industries, industries nested in countries). It provides for simultaneous partitioning of the variance–covariance components, while “explicitly accounting for the independence of errors assumptions that may be violated when using other techniques such as OLS regression” (Short *et al.*, 2009). In addition, HLM is more flexible with data since it does not require balanced dataset to generate results, allowing for estimates of both random and fixed effects.

We use a three–level model to test the effects of firms (level–1) nested within the effects of industries (level–2) nested within the effects of countries (level–3) among developed and emerging as well as in the overall sample for three different time periods. Most past studies in the debate have measured firm performance in terms of economic attainment using principally Return–on–Asset (ROA) ratios. For comparability purposes we also employ the ROA, averaged for each examined period. Thus for the overall model, Mean–ROA for the entire period (2005–2011) is used, whereas for the expansion period we use Mean–ROA for the years 2005–2007, and for the recession we use Mean–ROA for the years 2008–2011.

The level–1 model corresponds to the performance of each firm as a function of an industry mean and random error. Thus:

$$Performance_{ijk} = \pi_{0j} + e_{ij}, \quad (1)$$

where $Performance_{ijk}$ is the average ROA of firm i in industry j in country k . The coefficient π_{0j} is the level–1 (firm) intercept, and e_{ij} is a random firm effect (the deviation of firm ij ’s score from the industry mean). The effects are assumed to be normally distributed with a zero mean and variance σ^2 . The subscripts i, j and k designate firms, industries and countries with $i = 1, 2, \dots, n_i$ firms within industry $j; j = 1, 2, \dots, n_j$ industries, within countries $k; k = 1, 2, \dots, n_k$ countries.

The level–2 (industry) model corresponds to the variability among industries with the industry mean (π_{0j}) varying randomly around a grand mean. In this level, the level–1 regression coefficient (π_{0j}) is used as outcome variable related to each of the level–2 predictors. Thus:

$$\pi_{0j} = \beta_{00j} + r_{0j}, \quad (2)$$

where β_{00j} is the grand mean, and r_{0j} is the random industry effect (the deviation of industry j 's mean from the grand mean). Again, these effects are assumed to follow a normal distribution and have a zero mean and variance τ_π .

The level-3 (country) model corresponds to the variability among countries, with the country mean (γ_{000}) varying randomly around a grand mean:

$$\beta_{00j} = \gamma_{000} + u_{00k}, \quad (3)$$

where γ_{000} is the grand mean and u_{00k} is the random country effect (the deviation of country's k 's mean from the grand mean). Again, these effects are assumed to follow a normal distribution and have a zero mean and variance τ_β . In this study, the objective of the three-level model is to partition the variability in *performance*_{ijk} (ROA) into its components: among firms within industries, σ^2 (level-1), among industries, τ_π (level-2) and among countries τ_β (level-3). Thus the overall model becomes:

$$Performance_{ijk} = \gamma_{000} + r_{0j} + u_{00k} + e_{ij} \quad (4)$$

The calculation of the Variance Partition Coefficient (VPC) allows the estimation of the variance that can be attributed to firms within industries [$\sigma^2 / (\sigma^2 + \tau_\pi + \tau_\beta)$], among industries [$\tau_\pi / (\sigma^2 + \tau_\pi + \tau_\beta)$] and among countries [$\tau_\beta / (\sigma^2 + \tau_\pi + \tau_\beta)$].

Furthermore, to test some of the study hypotheses, we need to estimate the interaction effects between Industry and Country. As this interaction is another way of nesting one factor within another, we can treat our model as a 3-level model with crossed terms. First, we create a set of indicator explanatory variables, one for each Country at level-3, with random intercepts uncorrelated and with variances constrained to be equal. Then we generate the interaction groups, by combining the industry with the country of each company in the sample, resulting in 760 different groups. Finally, we use an additional nesting level to estimate the variance component for the interaction term Country \times Industry.

ANALYSIS AND RESULTS

Preliminary findings

According to data from the World Bank, the global GDP growth rate, which was around five percent during 2005–2007, declined to three percent in 2008 and turned negative in 2009 (Figure 1a). The above pattern is consistent across our sample of developed and emerging economies, although naturally the latter project higher overall GDP growth rates (Figure 1b). Furthermore, during the year 2008 alone approximately \$17.6 trillion in market capitalization was lost (–43 percent) in the examined developed capital markets and another \$6.3 trillion (–58 percent) in the emerging ones (Figure 1c). Therefore, it becomes clear that the 2008 recession had a severe impact across the global economy, slowing down global GDP, and costing over \$24 trillion in market capitalization across the biggest emerging and developed countries.

—————Insert Figure 1 here—————

The above patterns are similar when examining firm profitability. In Panel A of Table 1, we present mean Return on Assets (ROA percent) per year, for the entire sample and for each of the two subsamples of emerging and developed countries. The grand mean ROA for all years across all countries is 1.35 percent. Companies in emerging countries exhibit higher mean ROA than their developed counterparts (3.42 percent vs. 0.43 percent respectively). However, both subsamples experienced similar patterns of decline in the years following the 2008 recession. The average post-recession Mean-ROA was lower by 1.28 and 2.39 for firms in emerging and developed countries accordingly. Individual country differences in mean ROA performance are also very interesting (see Panel B – Table 1). Across all developed countries, mean ROA presented significant declines. Meanwhile, the mean ROA in emerging countries dropped significantly in 7 out the 10 examined markets (in three cases the change was insignificant). The above preliminary results confirm that the impact of the 2008 recession was certainly comparable across countries at different stage of economic development.

—————Insert Table 1 here—————

Empirical results

Firm and industry effects in recessionary economic periods compared to expansion periods

(Hypotheses 1 and 2)

In Table 2 we present the results for the main and interaction effects from all HLM estimations. In Panel A, three different models were estimated, namely one main effects model for all years, one for the expansionary period (2005–07) and one for the recessionary period (2008–11). Revisiting the case of firm and industry effects on profitability, we clearly see the predominance of firm effects across all main effects models, as has been strongly supported by most past studies. Indeed, firm effects account for the majority of the ROA variance under all three models, with VPC coefficients ranging from 87.31 percent to 90.38 percent. This is an important finding. When examining the differences between the two contrasting periods, we observe that firm effects in recessionary periods are higher than those in expansionary periods, offering strong support to the first hypothesis (H1). The difference in the VPC is 3.07 percent.

With respect to the industry effects, our results also support *Hypothesis 2* (H2). In particular, while the industry effects account for 9.47 percent of the total variance during the period of expansion, their explanatory power is reduced considerably to 6.13 percent during the recession. The difference in the VPC is 3.35 percent. Finally, the model χ^2 is highly significant at 0.001 across all three models⁵.

Country effects in emerging economies in recessionary economic periods compared to expansion periods (Hypothesis 3)

In Panel B, we present the results from three further models of emerging economy firms only. In particular, we estimate one main effects model for all years, one for the expansionary period (2005–07) and one for the recessionary period (2008–11), with the aim to examine the behaviour of country effects in emerging economies across the two periods. The empirical evidence verifies the expectation

⁵ While a limitation of the 3-level random coefficient model is the lack of tests for the statistical significance for each variance partition coefficient (VPC), the fact that the model χ^2 is significant offers an appropriate degree of assurance. However, for the purposes of the study, only differences over 1 percent across the two periods are considered large enough to give support to our hypotheses.

that country effects are typically stronger in emerging economies. Indeed, once we exclude developed markets in our analysis (Panel B vs. Panel A), the country effects rise from 3.45 percent to 4.42 percent of the total variance in ROA. More importantly however, our analysis confirms *Hypothesis 3* (H3): country effects in emerging economies dropped from 6.38 percent during expansion to 2.75 percent during the recession, showing a decline of 3.63 percent in explaining total ROA variance.

Country–industry effects in recession compared to expansion periods (Hypothesis 4)

In Panel C, we present the results from three further models of the entire sample. In particular, we estimated three extended ‘Country x Industry’ interaction effects models: one for all years, one for the expansionary period (2005–2007), and one for the recessionary period (2008–11).

The inclusion of the country–industry interaction term yields some intriguing results. In particular, we can see that –as expected– the country–industry effects drop during recession. In fact, while in the expansionary periods country–industry effects account for 6.62 percent of the variance in ROA, in the recessionary periods they drop to 4.17 percent, fully supporting *Hypothesis 4*. The difference in the VPC is 2.45 percent and the model χ^2 is highly significant at 0.001 across all three models.

Interestingly, a closer look across the two Panels A and C provides some unexpected insights. We observe that the country – industry interaction effects overtake the main industry effects in all three models. In fact, when the interaction term is introduced in Panel C, the industry effects drop to 2.63 percent (from 7.83 percent in Panel A) in the all–years model. The results are similar for expansionary and recessionary periods. Although the direction of the relationship in all the above cases remains the same, clearly supporting *Hypothesis 2*, the reduction of the main industry effects suggests that it is not the industry effects that singularly matter for firm performance, but rather the combined country–industry effect.

—————Insert Table 2 here—————

Sensitivity analysis and robustness of the results

The above findings suggest that the state of the global economy influences the role of firm, industry, and country effects on firm profitability. To test the hypotheses, we employed data for two distinct periods, namely the expansion (2005–07) and the recession (2008–11). We used a sample of ‘all countries’ to test *Hypotheses 1, 2 and 4*, and data from ‘emerging countries’ only to test *Hypothesis 3*. However, for these conclusions to be robust, we need to ascertain that the empirical results are not driven by the predominance of developed market firms in the sample (10,422 vs. 4,586 firms). After all, since the institutional environments are generally known to differ markedly between developed and emerging economies (Peng *et al.*, 2008), one might expect the influence of a recession on firm, industry and country effects to differ across developed and emerging economies.

To validate the above findings in a more stringent setting, we produce a set of further model estimations, where the initial sample is split into emerging versus developed, and all hypotheses are re-tested. Specifically, we estimate four new main-effects models: two for developed countries – during expansion and recession– and another two for emerging economies. We present the results in Panel A of Table 3. We note that the original hypotheses are confirmed as proposed. With respect to *Hypothesis 1*, firm effects are always higher in the recession compared to expansion, among both the developed and the emerging countries. In addition, with respect to *Hypothesis 2*, industry effects are lower during the recession, across both developed and emerging countries.

In panel B of Table 3, we present the results of four new country–industry interaction effects HLM models. The results for *Hypotheses 1 and 2* are robust to the inclusion of the interaction term, although the decline is less pronounced in emerging countries. With regards to *Hypothesis 4*, country–industry effects remain indeed lower during the recession, irrespective of the country stage of development. However, the decline is more pronounced among the developed countries, where country–industry effects drop by 2.05 percent, compared to 0.43 percent across emerging countries. As was the case in the main results (Table 2), the addition of the country–industry interaction term causes the explanatory power of the industry main effect to drop significantly, without however altering the hypothesised direction.

Consequently, we suggest that the study results are robust when we break the sample into developed and emerging economy firms, with firm, industry and country–industry effects being similarly influenced by the global post–2008 recession.

—————Insert Table 3 here—————

Additional country–specific analysis

While it is traditional to examine the behavior of firms by placing them into developed vs. emerging country categories, this may be seen as arbitrary in practice. Such a broad categorization may mask the significant variations within each category. Due to the unique characteristics of each country’s institutional environment, one could reasonably expect that the global recession may have had idiosyncratic influences on the firm – industry effects relationship across different countries. Hence, to validate the study findings under an even more stringent setting, we further estimated a 2– level model (Firm– Industry) for each of the 20 countries separately, and for each of the two periods (expansion and recession). This analysis resulted in 40 firm–industry combinations, as shown in Appendix 1 (Table A1–2).

We conclude that the original findings, with regards to the study hypotheses, are fairly robust to this kind of scrutiny. Overall, firm effects are higher during recession in most countries whereas industry effects are reduced respectively. However, the largest shifts in favor of firm–level explanations are found in specific countries like Norway, Mexico, Turkey, Austria, and India. This finding confirms the value of disaggregated analysis, which validates finer differences among countries categorized as either developed or emerging economy. Exceptions to the rule, presenting a decrease in firm effects during recession, are: Indonesia (–15.43%), Korea (–0.29%), Japan (–0.66%) and Switzerland (–1.77%). However, the model χ^2 for Indonesia and Switzerland is not significant, while the changes in Korea and Japan are rather negligible. In general, the study’s two key hypotheses, H1 and H2, are confirmed even at this most stringent country level of analysis, for 16 out of 20 countries in the sample.

DISCUSSION

The current study is driven by a central theoretical theme in strategic management: “the extent to which a firm’s fate is self-determined” (Short *et al.*, 2007: 161). By reconciling institutional theory with resource based view and industrial organization economics, we demonstrate that the context of the general economic environment is most critical in determining the role of firm, industry, and country effects on firm profitability. To this end, we examine firm, industry, and country effects for recessionary and expansionary periods, the periods immediately preceding and following the global financial crisis of 2008. The analysis reveals intriguing results.

First, we confirm that, irrespective of the economic environment, firm profitability is largely influenced by firm-specific effects, providing support for earlier work (McGahan & Porter, 2002, Short *et al.*, 2007). Yet, we find that firm specific effects are particularly amplified during recessionary periods. This result gives support to Oliver’s (1997) contention that firm heterogeneity should become more pronounced during economic crises, where the ‘rules of the game’ are fluid and strategic factor markets are more likely to be imperfect (Barney, 1986). In other words, we confirm our initial expectations (*Hypothesis 1*) that under periods of economic distress, strategic choices and capabilities gain importance in shaping firm profitability. It is noteworthy that these results are confirmed in the context of both developed and emerging economies, and found to be fairly stable as evidenced by a number of robustness tests.

Second, we find support for the importance of industry-specific effects on determining firm profitability. As suggested by industrial organization economics, the industry characteristics (i.e. structure, intensity of competition and market concentration) will affect firm’s strategic direction and ability to generate rents (Bain, 1951, Mann, 1966). Indeed, we reveal that the industry effects account for approximately 8 percent of the total of variance in firm ROA. Furthermore, we find that during the post-2008 recession, the impact of industry effects on firm profitability weakens (confirming *Hypothesis 2*). This supports our expectation that sudden shifts in formal and informal institutions will compel industry participants to employ firm-specific strategic responses, deviating from *isomorphic*

industry norms (Scott, 1987). Robustness tests confirm this pattern for both the emerging and developed economies contrast, and for individual countries.

Third, in harmony with past studies (Makino *et al.*, 2004; McGahan and Victor, 2010), we confirm that country level effects are more pronounced in emerging economies than in developed ones. This phenomenon has been attributed to the presence of internal market structures, developed to bypass the institutional inefficiencies (Peng *et al.*, 2008; Chakrabarti, Vidal & Mitchell, 2011). More importantly, we examine the impact of the recession on the country effects on the emerging economies alone, and find them to decline in significance by more than 60 percent (from 6.38 to 2.75 percent of total variance in firm ROA). This unique finding suggests that sudden economic shocks affect both the external and internal markets in emerging economies, thereby reducing overall country effects. Effectively, in periods of recession, emerging economies firms will have to rely on their own resources and capabilities and less on country-specific norms.

Fourth, we find convincing evidence for the importance of the country–industry interaction effects on firm profitability. Consistent with the work on foreign MNEs affiliates (Hawawini *et al.*, 2004, McGahan & Victor, 2010, Tong *et al.*, 2008), our findings suggest that the way each country utilizes its resources to develop unique industrial competencies is paramount for firm performance. In addition, the findings advance our knowledge on the behaviour of country–industry effects during recession. In particular, we reveal that country–industry interaction effects are reduced during recessions (from 6.62 to 4.17 percent), confirming *Hypothesis 4*. During recessions, the advantages associated with specific industries are moderated, reducing the overall impact of the country–industry effects on firm performance.

Fifth, the “take–home message” for managers is that the firm’s own fate is, to a great extent, self-determined, a reality that is even more pronounced during periods of extreme economic hardship. In periods of generalised economic adversity, the role of the industry and the country are reduced and the firm’s own resources and capabilities become even more important for firm performance. Under such conditions, managers will need to make the best use of the limited resources available, in order

to over-perform the market and survive, or risk facing extreme departures from the country–industry trend and experience severe underperformance.

Country-specific implications

Large vs. small economies: effects during expansion and recession

The size of the economy may contribute to the stability of firm – industry effects, leading to relatively smaller changes between the two periods. Indeed, in the individual country analysis (Table II–1 in Appendix), we find that changes in the respective magnitude of firm–industry effects are smaller in the case of large economies such as China, Japan, U.S., U.K. and Canada. In contrast, we find that most noticeable shifts are exhibited in the case of smaller economies, such as Norway, Sweden, Mexico and Turkey. Why would the size of an economy matter? One explanation could be that in a smaller economy, shifts in demand will result in relatively higher competition within the domestic market, compelling firms to react more urgently and in pronounced ways against adversity. In such cases, firm strategic choices may become even more important in explaining performance.

Specific case of Brazil, India and China

The behavior of the three BRIC countries deserves special examination (Russia was excluded from the analysis due to unreliable data). With respect to China, we find a remarkable stability in the respective roles of industry vs. firm–level variation between the expansion and recession. Although firm effects in China did become stronger as expected (*H1* supported), and industry effects did become weaker accordingly (*H2* supported), the overall firm–industry relationship did not change dramatically. One explanation is that a great majority of the Chinese GDP is still accounted by state-owned enterprises that are run by bureaucrats who are more responsive to centralised political directives rather than global economic forces. Another explanation is that, through massive deliberate investment prior and immediately after the global recession, China did manage to insulate itself from adverse effects in the worldwide economy. Indeed, despite Chinese GDP growth rate experiencing

one of the highest declines across the emerging economies (from 12.72 to 9.65 percent between the two periods), Chinese growth remained remarkable.

Similarly, Brazil also did not exhibit a major shift in the distribution of firm vs. industry level effects (although both *H1* and *H2* were confirmed). Firm level variance registered only a modest gain following the recession (1.44%). Explanations could be based on the relatively stable growth during the years of the Lula presidency, the robust growth in its primary industries (oil, agriculture, mining), and/or relatively large role of the state ownership in the country's GDP.

Of the three BRIC countries, only in India firm-effects marked a significant over 5 percent increase at the expense of the industry-level effects. This result may be due, in part, to the dynamic nature of the Indian economy following the economic reforms, which begun in earnest in the early 1990s. Following these remarkable market liberalization efforts, Indian firms achieved much flexibility and freedom in responding to global economic trends. Respectable rates of economic growth followed, bringing about a rising middle class, equipped with substantial disposable income (Cavusgil and Cavusgil, 2012). Hence, domestic economic dynamics in India may have tempered adverse global economy trends, thus facilitating Indian firms, market performance.

Implications for future research

Potency of Firm Effects on Multiple Contexts: The finding that reveal substantial impact of firm effects on performance – consistently across both expansionary periods and times of great economic turbulence – implies prevalent and durable nature of firm strategy. We note that the lowest variance partition coefficient (VPC) for firm effects was 87 percent. Future research should explore the consistency of this effect in other contexts. One such context is the ownership type. Will the firm effect continue to be so dominant across: (a) publicly owned; (b) privately owned; and (c) state owned companies? One may speculate that managers of privately owned firms may have greater discretion with respect to strategic choices and, therefore, be in a better position to combat environmental turbulence. Another context for exploring the behaviour of firm effects would be organizational

culture, i.e. autocratic versus democratic leadership styles. Similarly, scholars can explore the relevance of such national cultural variables as tolerance for ambiguity. In summary, it would be worthwhile to examine the consistency of firm effects, in comparison to industry and country effects, across diverse organizational contexts in order to strengthen the generalizability of the results.

Types of Resources Deployed: While the findings reported here offer unambiguous evidence that firm effects prevail during both expansionary and recessionary periods, we do not know exactly what types of strategic choices or managerial actions tend to promote superior performance. Expressed differently, this question refers to the versatility of firm resources. We learn that managers are able to deploy a variety of organizational capabilities and strategic assets when it comes to managing environmental turbulence. However, our knowledge of suitability of specific firm resources that are most appropriate under such circumstances is inadequate. One relevant dimension to consider is organizational slack. Slack resources are often thought to give impetus to enhance performance (Cheng & Kesner, 1997, Latham & Braun, 2008, Tan & Peng, 2003). Capabilities and assets that may lay dormant in the firm could be mobilized at times of necessity. If so, firm processes for discovering and deploying slack resources during adversity are of utmost concern. Scholars may also investigate the types of slack resources that are most productive in overcoming prolonged economic turbulence.

Alternative Performance Measures: Finally, in this study, we employed ROA as the proxy for firm performance. Future research could, for example, utilize such alternative measures of firm performance as sales, profitability, growth, and Tobin's Q. These efforts will surely lend further evidence for the findings reported in the present study based on both performance variables selected and data equivalence issues explored across types of countries (e.g., Hult et al. 2008a, 2008b).

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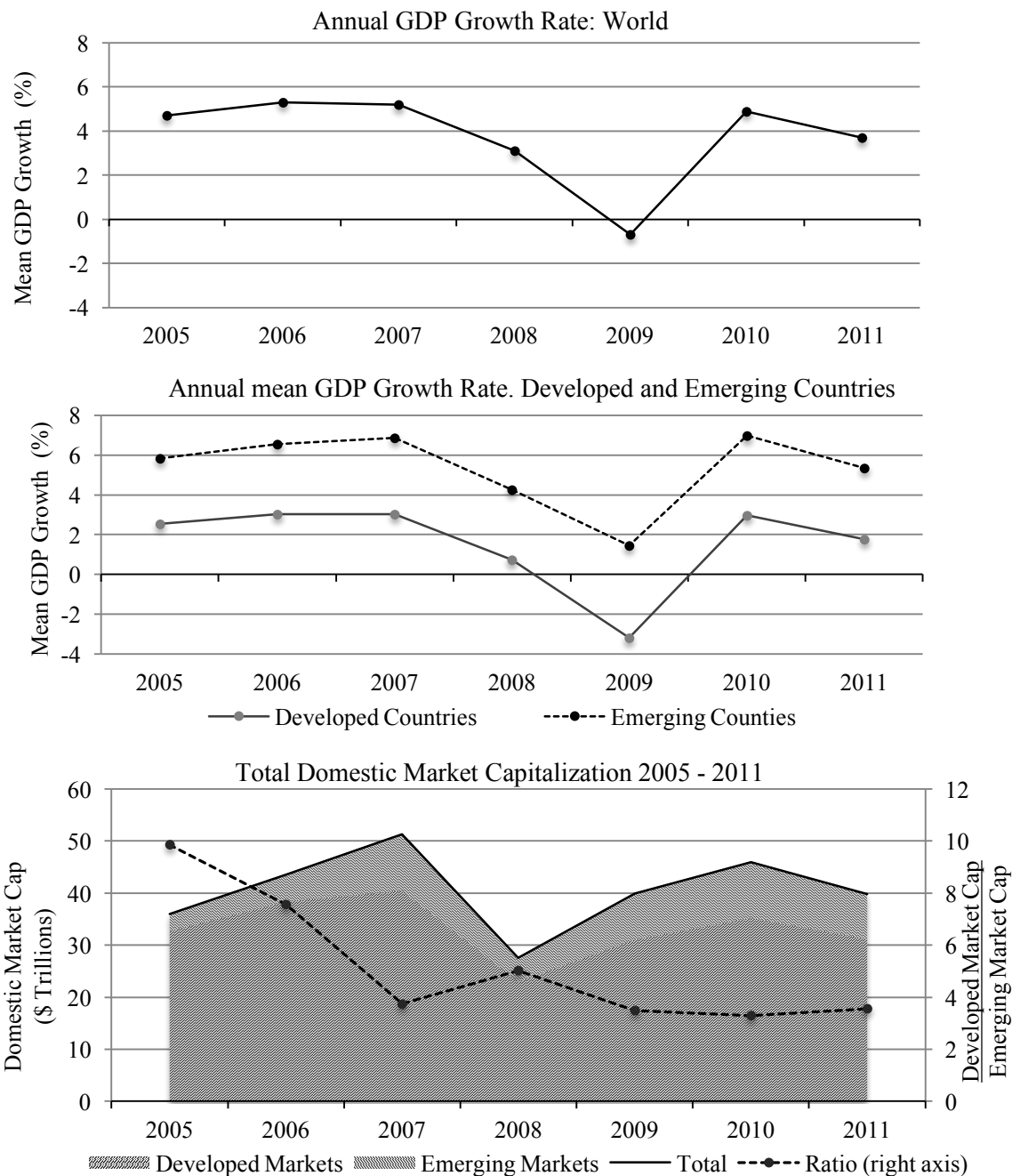
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TABLES & FIGURES

Figure 1. GDP Growth and Domestic Market Capitalization in Emerging and Developed Markets



Notes: The first figure illustrates the global GDP growth rate during the period 2005–2011 and the second the mean GDP growth rate for two country groups (developed – emerging) from our sample. The third figure portrays the combined market capitalization across the ten largest developed and emerging capital markets in our sample. The dashed line represents the annual ratio of the total market cap of the developed markets over that of the emerging ones. The countries and their respective stock markets in our sample are: *Developed Countries (Markets):* Australia (*Australian SE*), Canada (*TMX Group*), Germany (*Deutsche Borse*), Japan (*Tokyo SE Group*), Netherlands (*NYSE Euronext (Europe)*), Norway (*Oslo Bors*), Sweden (*NASDAQ OMX Nordic Exchange*), Switzerland (*SIX Swiss Exchange*), UK (*London SE Group*) and USA (*NYSE Euronext (US)* and *NASDAQ OMX*). *Emerging Countries (Markets):* Brazil (*BM&F Bovespa*), China (*Shenzhen SE* and *Shanghai SE*), India (*BSE Ltd*), Indonesia (*Indonesia SE*), South Korea (*Korea Exchange*), Mexico (*Mexican Exchange*), Philippines (*Philippine SE*), Poland (*Warsaw SE*), South Africa (*Johannesburg SE*) and Turkey (*IMKB*). Data Sources: World Federation of Exchanges and World Bank

Table 1. Key Descriptive Statistics

<i>Panel A: Number of Firm–Year Observations and Performance Statistics</i>						
Year	<i>Full sample</i>		<i>Emerging Countries</i>		<i>Developed Countries</i>	
	Count	Mean ROA (%)	Count	Mean ROA (%)	Count	Mean ROA (%)
2005	15,008	2.24	4,586	3.71	10,422	1.59
2006	15,008	2.68	4,586	4.17	10,422	2.02
2007	15,008	2.65	4,586	4.58	10,422	1.81
2008	15,008	−0.34	4,586	2.25	10,422	−1.48
2009	15,008	−0.91	4,586	2.65	10,422	−2.47
2010	15,008	1.75	4,586	3.65	10,422	0.92
2011	15,008	1.34	4,586	2.90	10,422	0.66
Total	105,056	1.35	32,102	3.42	72,954	0.43

<i>Panel B: Performance per Country During Expansion (2005–2007) and Recession (2008–2011)</i>				
<i>Emerging Countries</i>	Mean ROA (%)		Change	T–Test
	<i>Expansion</i>	<i>Recession</i>		
Brazil	2.71	2.37	−0.34	(−0.44)
China	3.46	2.85	−0.61**	(−3.07)
Indonesia	2.34	2.93	0.58	(1.03)
India	7.02	4.99	−2.03***	(−5.82)
Korea	3.25	1.47	−1.77***	(−5.51)
Mexico	5.36	3.14	−2.22**	(−2.53)
Philippines	3.79	3.59	−0.21	(−0.28)
Poland	5.31	1.34	−3.96***	(−5.75)
Turkey	3.99	1.83	−2.16**	(−3.03)
South Africa	8.38	4.88	−3.50***	(−4.58)
<i>Developed Countries</i>	Mean ROA (%)		Change	T–Test
	<i>Expansion</i>	<i>Recession</i>		
Australia	1.11	−1.79	−2.90***	(−4.04)
Canada	0.99	−1.18	−2.17***	(−3.46)
Switzerland	4.31	1.46	−2.85***	(−3.74)
Germany	3.27	0.59	−2.67***	(−5.43)
UK	2.47	−0.12	−2.58***	(−6.38)
Japan	2.68	0.73	−1.95***	(−15.73)
Netherlands	5.16	−0.26	−5.42***	(−4.96)
Norway	2.63	−1.46	−4.08**	(−3.28)
Sweden	2.36	−0.60	−2.96**	(−2.76)
USA	0.68	−1.76	−2.44***	(−9.93)

<i>Emerging Economies</i>	4.15	2.86	−1.28***	(9.31)
<i>Developed Economies</i>	1.81	−0.59	−2.39***	(18.79)

Notes: ***, **, * significant at 0.001, 0.01 and 0.05 respectively

Table 2. Variance Decomposition Results: Expansion vs. Recession Period*Panel A: Main Effects Model – All Countries (H1 and H2)*

	<i>All Years</i>		<i>Expansion</i>		<i>Recession</i>		<i>Difference</i> VPC
	VC ^a	VPC ^b	VC	VPC	VC	VPC	
Firm Effects	54.660 (0.322)	88.73%	61.870 (0.364)	87.31%	68.760 (0.404)	90.38%	3.07% [H1]
Industry Effects	4.822 (0.251)	7.83%	6.714 (0.328)	9.47%	4.663 (0.268)	6.13%	-3.35% [H2]
Country Effects	2.124 (0.396)	3.45%	2.279 (0.435)	3.22%	2.657 (0.493)	3.49%	0.28%
LR test χ^2 (2):	1,450.30 ^{***}		1,414.30 ^{***}		1,226.70 ^{***}		

Panel B: Main Effects Model – Emerging Economies (H3)

	<i>All Years</i>		<i>Expansion</i>		<i>Recession</i>		<i>Difference</i> VPC
	VC ^a	VPC ^b	VC	VPC	VC	VPC	
Firm Effects	30.030 (0.327)	84.36%	39.680 (0.431)	83.27%	37.570 (0.408)	87.86%	4.59%
Industry Effects	3.995 (0.333)	11.22%	4.933 (0.419)	10.35%	4.018 (0.359)	9.40%	-0.95%
Country Effects	1.572 (0.406)	4.42%	3.039 (0.753)	6.38%	1.174 (0.326)	2.75%	-3.63% [H3]
LR test χ^2 (2):	709.00 ^{***}		389.70 ^{***}		261.20 ^{***}		

Panel C: Interaction Effects Model – All Countries (H4)

	<i>All years</i>		<i>Expansion</i>		<i>Recession</i>		<i>Difference</i> VPC
	VC	VPC	VC	VPC	VC	VPC	
Firm Effects	54.620 (0.321)	88.36%	61.840 (0.364)	86.99%	68.720 (0.403)	90.12%	3.14%
Industry Effects	1.628 (0.231)	2.63%	2.043 (0.283)	2.87%	1.734 (0.253)	2.27%	-0.60%
Country Effects	2.203 (0.400)	3.56%	2.498 (0.460)	3.51%	2.613 (0.475)	3.43%	-0.09%
Country x Industry	3.364 (0.205)	5.44%	4.709 (0.268)	6.62%	3.183 (0.218)	4.17%	-2.45% [H4]
LR test χ^2 (3):	1,500.50 ^{***}		1,470.80 ^{***}		1,272.30 ^{***}		

Notes:^aVC = Variance Component / ^bVPC = Variance Partition Coefficient / Standard Errors in brackets ()*** Prob > χ^2 significant at 0.001

Table 3. Variance Decomposition Results: Robustness Tests

<i>Panel A: Main Effects Model</i>					
<i>Emerging Countries</i>	<i>Expansion</i>		<i>Recession</i>		<i>Difference</i>
	<i>VC^a</i>	<i>VPC^b</i>	<i>VC</i>	<i>VPC</i>	
Firm Effects	39.680 (0.431)	83.27%	37.570 (0.408)	87.86%	4.59%
Industry Effects	4.933 (0.419)	10.35%	4.018 (0.359)	9.40%	-0.96%
Country Effects	3.039 (0.753)	6.38%	1.174 (0.326)	2.75%	-3.63%
LR test χ^2 (2):	389.70***		261.20***		
<i>Developed Countries</i>	<i>Expansion</i>		<i>Recession</i>		<i>Difference</i>
	<i>VC</i>	<i>VPC</i>	<i>VC</i>	<i>VPC</i>	
Firm Effects	71.400 (0.503)	89.05%	82.160 (0.578)	93.10%	4.04%
Industry Effects	8.649 (0.520)	10.79%	5.930 (0.425)	6.72%	-4.07%
Country Effects	0.127 (0.160)	0.16%	0.162 (0.119)	0.18%	0.03%
LR test χ^2 (2):	827.10***		530.50***		
<i>Panel B: Main and Interaction Effects Model</i>					
<i>Emerging Countries</i>	<i>Expansion</i>		<i>Recession</i>		<i>Difference</i>
	<i>VC</i>	<i>VPC</i>	<i>VC</i>	<i>VPC</i>	
Firm Effects	39.740 (0.432)	83.69%	37.580 (0.408)	87.94%	4.25%
Industry Effects	1.206 (0.262)	2.54%	1.045 (0.249)	2.45%	-0.09%
Country Effects	3.037 (0.743)	6.40%	1.141 (0.311)	2.67%	-3.73%
Country x Industry Effects	3.503 (0.380)	7.38%	2.970 (0.330)	6.95%	-0.43%
LR test χ^2 (3):	401.40***		270.70***		
<i>Developed Countries</i>	<i>Expansion</i>		<i>Recession</i>		<i>Difference</i>
	<i>VC</i>	<i>VPC</i>	<i>VC</i>	<i>VPC</i>	
Firm Effects	71.340 (0.501)	88.79%	82.050 (0.576)	92.79%	4.00%
Industry Effects	3.514 (0.467)	4.37%	2.704 (0.390)	3.06%	-1.32%
Country Effects	0.904 (0.331)	1.13%	0.435 (0.179)	0.49%	-0.63%
Country x Industry Effects	4.586 (0.357)	5.71%	3.235 (0.299)	3.66%	-2.05%
LR test χ^2 (3):	882.80***		573.90***		

Notes:
^a VC = Variance Component / ^b VPC = Variance Partition Coefficient / Standard Errors in brackets ()
*** Prob> χ^2 significant at 0.001

APPENDIX 1

Table A1–1. Data Description: Number of Firms Per Country and Industry

<i>Panel A: Emerging Countries</i>									
SIC 2 ^a :	10–14	15–17	20–39	40–49	50–51	52–59	60–67	70–89	Total
Brazil	3	14	108	52	5	10	42	17	251
China	56	81	1,013	166	63	80	150	89	1,698
Indonesia	20	12	113	24	18	12	78	13	290
India	9	43	378	45	5	2	64	72	618
Korea	2	44	628	46	31	13	56	76	896
Mexico	2	10	33	9	0	11	19	3	87
Philippines	11	10	33	24	0	2	59	16	155
Poland	2	23	86	15	13	3	25	24	191
Turkey	0	2	130	11	3	4	36	10	196
South Africa	14	11	51	15	12	21	50	30	204
Subtotal	119	250	2,573	407	150	158	579	350	4,586
<i>Panel B: Developed Countries</i>									
SIC 2 :	10–14	15–17	20–39	40–49	50–51	52–59	60–67	70–89	Total
Australia	69	15	126	45	21	23	138	128	565
Canada	121	13	164	60	21	25	125	77	606
Switzerland	0	0	93	12	4	3	62	19	193
Germany	0	9	217	42	14	10	105	115	512
UK	45	29	262	62	25	55	357	232	1,067
Japan	5	178	1,487	178	255	310	250	485	3,148
Netherlands	3	7	40	0	6	2	20	27	105
Norway	26	2	27	18	0	0	26	11	110
Sweden	4	4	107	9	4	4	30	56	218
USA	170	40	1,438	312	106	211	994	627	3,898
Subtotal	443	297	3,961	738	456	643	2,107	1,777	10,422
Grand Total	562	547	6,534	1,145	606	801	2,686	2,127	15,008
Notes:									
10–14	<i>Mining</i>								
15–17	<i>Construction</i>								
20–39	<i>Manufacturing</i>								
40–49	<i>Transportation & Public Utilities</i>								
50–51	<i>Wholesale Trade</i>								
52–59	<i>Retail Trade</i>								
60–67	<i>Finance, Insurance, Real Estate</i>								
70–89	<i>Services</i>								
^a Standard Industrial Classification (SIC 2) codes are grouped in this table for brevity purposes									

Table A1–2. Variance Decomposition Results per Country

	Panel A: Firm Effects (<i>H1</i>)					Panel B: Industry Effects (<i>H2</i>)				
	VC ^a		VPC ^b		Diff.	VC ^a		VPC ^b		Diff.
	<i>Expansion</i>	<i>Recession</i>	<i>Expansion</i>	<i>Recession</i>		<i>Expansion</i>	<i>Recession</i>	<i>Expansion</i>	<i>Recession</i>	
BRA (N=260)	64.67 (3.17)	58.96 (2.84)	81.76% [15.3***]	83.35% [18.1***]	1.59%	14.43 (3.54)	11.78 (2.78)	18.24% [15.3***]	16.65% [18.1***]	-1.59%
CHN (N=1704)	33.41 (0.58)	30.86 (0.54)	94.65% [27.2]	96.10% [20.0]	1.44%	1.89 (0.41)	1.25 (0.27)	5.35% [27.2]	3.90% [20.0]	-1.44%
IDN (N=304)	43.07 (1.88)	39.04 (1.73)	94.60% [2.6]	79.17% [19.7***]	-15.43%	2.46 (1.05)	10.27 (2.12)	5.40% [2.6]	20.83% [19.7***]	15.43%
IND (N=631)	30.87 (0.91)	33.11 (0.96)	81.22% [70.0***]	87.04% [53.8***]	5.83%	7.14 (1.33)	4.93 (0.93)	18.78% [70.0***]	12.96% [53.8***]	-5.83%
KOR (N=905)	46.03 (1.12)	41.55 (1.01)	92.73% [18.7***]	92.45% [25.7***]	-0.29%	3.61 (0.91)	3.40 (0.85)	7.27% [18.7***]	7.55% [25.7***]	0.29%
MEX (N=103)	28.72 (2.3)	31.93 (2.41)	85.50% [3.1*]	98.32% [0.1]	12.82%	4.87 (1.86)	0.55 (1.0)	14.50% [3.1]	1.68% [0.1]	-12.82%
PHL (N=165)	35.79 (2.16)	33.96 (2.06)	85.93% [5.3*]	88.11% [3.8*]	2.17%	5.86 (1.89)	4.58 (1.71)	14.07% [5.3*]	11.89% [3.8*]	-2.17%
POL (N=202)	45.03 (2.42)	49.91 (2.48)	98.90% [0.1]	100.00% [0.0]	1.10%	0.50 (0.99)	0.00 (0.00)	1.10% [0.1]	0.00% [0.0]	-1.10%
TUR (N=206)	43.10 (2.28)	43.39 (2.23)	84.19% [18.6***]	95.53% [2.5]	11.34%	8.10 (1.92)	2.03 (0.90)	15.81% [18.6]	4.47% [2.5]	-11.34%
ZAF (N=216)	63.23 (3.23)	57.63 (2.77)	99.89% [0.0]	100.00% [0.0]	0.11%	0.07 (1.04)	0.00 (0.00)	0.11% [0.0]	0.00% [0.0]	-0.11%
AUS (N=576)	127.40 (3.88)	140.70 (4.27)	89.77% [28.7***]	95.70% [6.7**]	5.93%	14.52 (2.67)	6.33 (1.86)	10.23% [28.7**]	4.30% [6.7**]	-5.93%
CAN (N=623)	99.29 (2.91)	107.40 (3.15)	84.21% [53.1***]	87.15% [32.9***]	2.94%	18.62 (2.96)	15.84 (2.76)	15.79% [53.1***]	12.85% [32.9***]	-2.94%
CHE (N=208)	51.79 (2.65)	58.29 (3.05)	97.63% [0.7]	95.86% [1.1]	-1.77%	1.26 (0.94)	2.52 (1.50)	2.37% [0.7]	4.14% [1.1]	1.77%
DEU (N=528)	54.09 (1.72)	60.77 (1.93)	92.50% [13.1***]	95.94% [5.9**]	3.44%	4.39 (1.04)	2.57 (0.82)	7.50% [13.1***]	4.06% [5.9**]	-3.44%
GBR (N=1077)	84.20 (1.85)	83.19 (1.82)	94.28% [21.2***]	97.12% [15.0***]	2.84%	5.11 (1.02)	2.47 (0.66)	5.72% [21.2***]	2.88% [15.0***]	-2.84%
JPN (N=3161)	19.00 (0.24)	26.74 (0.34)	93.90% [125.3***]	93.23% [96.1***]	-0.66%	1.24 (0.17)	1.94 (0.28)	6.10% [125.3***]	6.77% [96.1***]	0.66%
NLD (N=120)	44.19 (3.17)	62.49 (4.31)	93.15% [1.0]	93.66% [1.9]	0.51%	3.25 (1.90)	4.23 (2.06)	6.85% [1.0]	6.34% [1.9]	-0.51%
NOR (N=623)	66.73 (4.7)	83.74 (6.27)	83.53% [4.5*]	99.10% [0.0]	15.58%	13.16 (4.58)	0.76 (3.66)	16.47% [4.5]	0.90% [0.0]	-15.58%
SWE (N=234)	110.60 (5.48)	115.80 (5.60)	86.53% [11.9***]	95.32% [2.7]	8.80%	17.22 (4.47)	5.68 (2.48)	13.47% [11.9]	4.68% [2.7]	-8.80%
USA (N=3929)	99.32 (1.13)	116.00 (1.32)	91.63% [339.1***]	93.96% [203.6***]	2.32%	9.07 (1.03)	7.46 (0.96)	8.37% [339.1***]	6.04% [203.6***]	-2.32%

Notes: ^a VC = Variance Component / ^b VPC = Variance Partition Coefficient / Standard Errors in brackets (...) / LR test χ^2 in square brackets [...] / *****: Prob> χ^2 significant at 0.001, 0.01, 0.1 respectively

The emerging countries sample includes Brazil (BRA), China (CHN), Indonesia (IDN), India (IND), South Korea (KOR), Mexico (MEX), Philippines (PHL), Poland (POL), Turkey (TUR) and South Africa (ZAF).

The developed countries sample includes Australia (AUS), Canada (CAN), Switzerland (CHE), Germany (DEU), United Kingdom (GBR), Japan (JPN), Netherlands (NDL), Norway (NOR) Sweden (SWE) and United States (USA)

APPENDIX 2

We present here a series of post hoc tests to establish the robustness of the study findings under alternative criteria. We first examine firm, industry and country effects for each year separately, without explicitly defining “expansion” or “recession”. Such a finer time–granularity allows us to examine the surrounding economic conditions as a continuum, rather than as a binary variable. Secondly, we focus on a single country (USA), but for a much longer time period (1975–2014), and examine how firm and industry Effects behave against key economic indicators. This latter approach has the additional advantage of providing measures of statistical significance.

Step 1: Examination of Firm–Industry–Country Effects per year

To proxy for the state of the global economic environment we choose the Consumer Confidence Index (CCI) for the OECD countries, one of the leading indicators of global economic activity (OECD, 2015). The advantage of the CCI, against global capital market–based indices, such as the ‘FTSE All–World’ or the ‘MSCI ACWI Index’, is that the CCI can be benchmarked against the absolute value of 100, which proxies for “normal” economic conditions. Values below 100, suggest reduced consumer confidence and economic contraction, while values above 100 indicate a positive sentiment in the global economy and growth prospects. In the Table below, we repeat the main analysis for all the companies in our sample by year. Then, we proceed by contrasting the results with the mean CCI during each year.

Table A2–1. Post hoc Analysis: Variance Decomposition Results

<i>Panel A: Mean Annual Consumer Confidence Index (OECD)</i>							
	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
CCI (OECD)	100.46	100.64	100.60	98.19	98.12	99.31	98.86
<i>Panel B: Variance Components per year</i>							
<i>VC^a</i>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Firm Effects	90.530 (0.510)	82.100 (0.463)	82.760 (0.466)	148.300 (0.834)	136.400 (0.764)	74.850 (0.421)	85.710 (0.482)
Industry Effects	8.112 (0.402)	7.681 (0.380)	6.706 (0.344)	9.615 (0.533)	6.893 (0.400)	4.482 (0.261)	4.819 (0.291)
Country Effects	3.261 (0.594)	2.973 (0.547)	3.282 (0.585)	5.832 (1.026)	4.638 (0.808)	2.251 (0.421)	2.020 (0.387)
LR test $\chi^2(2)$:	1,116.6***	1,147.70***	1,156.30***	1,273.40***	1,156.60***	882.70***	645.10***
<i>Panel B: Variance Partition Coefficients per year</i>							
<i>VPC^b</i>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Firm Effects	88.84%	88.51%	89.23%	90.57%	92.21%	91.75%	92.61%
Industry Effects	7.96%	8.28%	7.23%	5.87%	4.66%	5.49%	5.21%
Country Effects	3.20%	3.21%	3.54%	3.56%	3.14%	2.76%	2.18%

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The above results support that as the mean CCI declines from 2008 onwards, firm effects increase, presenting a consistently negative relationship with the economic sentiment. Naturally, industry effects follow the opposite direction and are positively related with CCI.

Step 2: Examination of Firm–Industry Effects per year

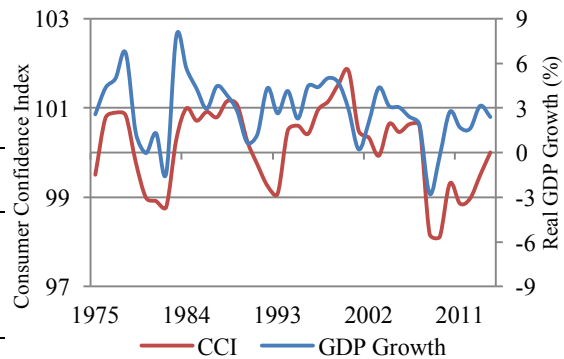
From Compustat, we retrieve annual accounting and industry (SIC2) information for all publicly listed companies in the US from 1975 to 2014. We calculate annual ROA for each firm and then estimate a 2–level model (Firm – Industry) for each of the 40 years in the period.

The results provide a “time series” of firm and industry effects (VC and VPC), to be contrasted against key economic indicators. On average, during the period 1975–2014, firm effects ranged from 92.80% to 97.60% with a mean of 95.78%. Accordingly, industry effects ranged between 2.40% and 7.20%, with a mean of 4.22%.

Next we test whether the level of firm effects, and by extension that of industry effects, is associated with the wider economic conditions. Instead of the binary approach (expansion– recession) in the main results, we examine continuous economic indicators, such as the CCI (as above) and Real GDP growth. Summary statistics are shown in Table A2–2 below and the two indicators are also plotted:

Table A2–2. Key Economic Indicators (USA: 1975 – 2014)

	Mean	SE	Min.	Median	Max.
CCI	100.15	0.14	98.12	100.44	101.83
GDP (%)	2.72	0.33	–2.80	2.99	7.26



We initially split the sample into years with $CCI \geq 100$ and $CCI < 100$ and similarly into years with above and below median GDP Growth. We then perform univariate parametric T–tests and non–parametric Wilcoxon Rank Sum tests for the difference in means (medians) in Table A2–3 below.

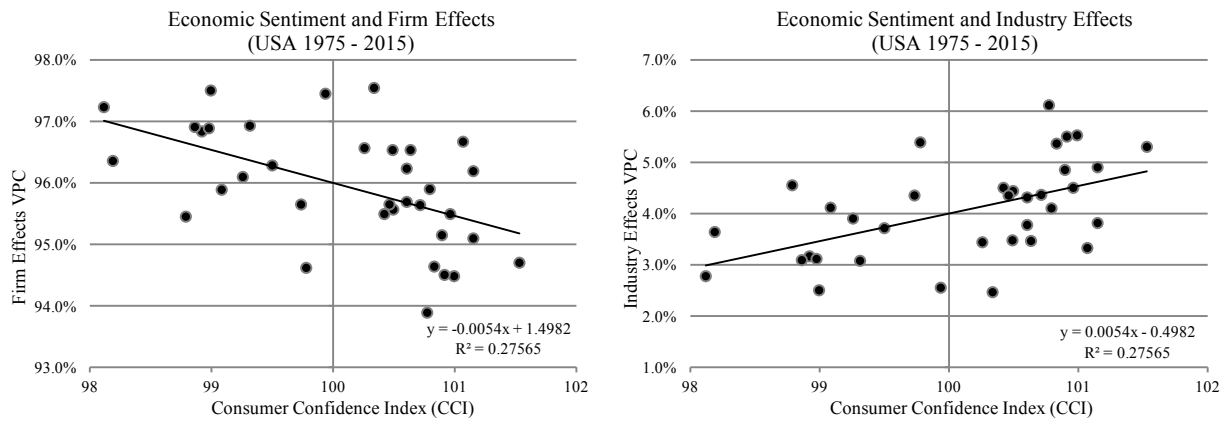
Table A2–3. Tests For Differences in Firm Effects

<i>Panel A: Parametric T– Test</i>			
	CCI <100	CCI ≥100	Difference
Count	15	26	
Mean Firm Effects	96.24%	95.52%	0.72%** (2.008)
	Low GDP	High GDP	Difference
Count	20	20	
Mean Firm Effects	96.33%	95.39%	0.94%*** (3.041)
<i>Panel B: Non–Parametric Wilcoxon Rank Sum Test</i>			
	CCI <100	CCI ≥100	z–score
Count	15	26	
Rank Sum	391	470	2.060**
	Low GDP	High GDP	z–score
Count	20	20	
Rank Sum	520.5	299.5	2.993***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Finally, in the following Figure A2–1 we plot the estimated Variance Partition Coefficients (VPC) for the firm and industry effects from the 40 2–level models during the period 1975 –2014, against the mean annual CCI. The OLS regression coefficient is -0.0054 (firm) and 0.0054 (industry) and significant, while the estimation has an R^2 of 27.56%. This is further evidence that our original findings are robust to the use of a continuous variable for the economic conditions. Therefore, our hypotheses that “Firm (Industry) effects will be stronger (weaker) in recessionary periods compared to expansion ones”, in general holds for a long period (1975–2014) for the US and when using continuous variables to proxy for economic conditions.

Figure A2–1. VPC for Firm and Industry Effects against CCI



We finally run another set of OLS regressions, this time controlling for sample size and year effects, while using Real GDP Growth and CCI as alternative proxies for the state of the economy. The results in Table A2–4 are robust across both models; the effect of the economy on firm effects is negative and significant at 1% and 5% respectively.

Table A2–4. Post Hoc Analysis: OLS Regressions of Economic Variables against Firm Effects

<i>DV = Firm Effects</i>	Real GDP Model	Consumer Confidence Model
Intercept	0.770 (1.363)	1.363* (1.822)
Real GDP Growth	-0.002*** (-2.801)	-
Consumer Confidence	-	-0.005** (-2.282)
Sample Size	0.000 (1.312)	0.000 (1.686)
Year Effects	✓	✓
F	13.550	10.909
R ²	0.366	0.350
Adj. R ²	0.313	0.296
N	40	40

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$