Norges miljø- og biovitenskapelige universitet

Master's Thesis 2018 30 ECTS

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What does affect firm profitability? Revisiting firm, industry and country effects on firm profitability

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Acknowledgements

This master thesis marks the end of my education and obtaining a Masters in Business Administration at the Norwegian University of Life Sciences. The process of writing this thesis has been challenging but foremost rewarding. I have written a thesis based on a topic that has been discussed for many years by several different researchers, and I believe this topic is still of interest. I hope I have produced a good scientific product that will be a useful contribution to the debate that is still very much discussed today. First, I would like to thank my supervisor Glenn Roger Kristiansen for helping me with the idea, guidance and support during the writing of this thesis. Finally, I would like to thank my parents, husband and friends for their tremendous support during my time studying and writing. Thank you for helping me through this educational journey and for believing in me.

Abstract

The purpose with this thesis is to examine the relevance of firm, industry and country effects on firm profitability under macroeconomic turbulence such as recessions. Despite years of research in the field of strategic management, it is still unclear to what extent firm, industry and country effects have on firm profitability under macroeconomic adversity. I revisit and reconcile the resource-based view and the industrial organization economic with institutional theory in order to investigate the effects of firm and industry effects on firm profitability in a changing economic environment. In order to investigate country effects on firm profitability a cross function of international business, international economics and finance will be applied. In addition, this thesis also employ return on assets as a performance measurement and incorporate elements of corporate finance, mainly the interest coverage ratio and degree of operating leverage. By integrating the interest coverage ratio and degree of operating leverage, I investigate if firms with a high interest coverage ratio and a high degree of operating leverage experience a higher return on assets.

By using a mixed effect model in a hierarchical linear multilevel model (HLM), I examine 4470 firms across 10 countries, mainly 5 developed countries and 5 emerging countries in Latin-America during 1999-2017. The Intra-class correlation coefficient (ICC) is used to establish the relative role of firm, industry and country effects on firm profitability. The depended variable in this study is mean ROA, while the fixed variables are the interest coverage ratio and degree of operating leverage.

The results from the analysis show that firm effects are more pronounce during all the periods presented but does not support past empirical research that firm effects are amplified during recessions. While firm effects constituted 89,13% in the period of 2001, it declined in the great recession (2008-2011) with -8,34%. As for industry effects, it did not lose some of its explanatory power under recession as expected. Industry effects constituted of 7,09% in the period of 2001 but increased to 12,78% in the period of great the great recession (2008-2011). In addition, country effects in emerging and developed countries experience a strong country effect. As for the interest coverage ratio and degree of operating leverage I find a small statistically significant coefficient in both of the variables. However, I question the practical significant of these results as the coefficients were very close to zero. By incorporating the fixed variables in the model firm effects increased while industry and country effects decreases as opposed to the variable effects model. These findings did not confirm with my assumptions that a firm's own fate is self-determined. Even though firms are to a great extent responsible for their own success, one should not ignore the industry structure. Which can become important under economic decline.

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1.0 Introduction

The debate between researchers in industrial organization economics and the field of strategic management concerning the main source of firm profitability has been an ongoing discussion for more than seventy years (Roquebert, Phillips, & Westfall, 1996). The question "Why do some firms outperform others?" has been in researches mind for decades. Despite considerable research in firm, industry and country effects on firm profitability, it is still unclear to what extent these factors influence firm performance.

It is highly important how a firm, while developing their strategy, position themselves in relation to its competitors, the industry, institutional environment, and geographical location. Scholars have therefore explored and developed different theoretical pillars that try to explain the sources of variances on firm profitability. The resource- based view argues that a firm's resources and capabilities are the primary source of its sustainable competitive advantage. Thus, suggesting that firm performance is greater among firms rather than among industries (Makino *et al.,* 2004b). However, industrial organization economics contradicts the above resource-based view and emphasizes the importance of industry structure as a key determinant factor for long-term firm profitability (Porter, 1980). Furthermore, the field of strategic management has researched how country effects relate to firm performance. Countries differ on a variety of attributes, some argue that country effects are as strong as industry effect (Makino, Isobe, & Chan, 2004b), and are therefore important to understand firm performance and profitability

Despite the different theories mentioned above explaining the main source of variance in profitability, the relative influence of firm, industry and country effects on firm profitability has been pronounced (Scamalensee, 1985: Rumelt, 1991; McGahan & Porter, 1997; Hawawini, Subramanian, & Verdin, 2004; Bamiatzi *et al*., 2016). Despite considerable research, the researchers still disagree on the relevance of each of these effects. Yet, there is a lack of empirical studies that establish the relevance of firm, industry and country effects on firm profitability during varying economic conditions. Bamiatzi et al. (2016) is one of the few studies incorporating economic cycles when estimating variance components of performance. In assessing the variance accounting for firm, industry and country effects on firm profitability, I model my work based on Bamiatzi et al. (2016). Therefore, in the present study, the primary motivation and focus of this thesis, is driven by the research question:

To what degree do firm, industry, and country effects influence firm profitability?

To differentiate my study from previous research, I have chosen to examine the relationship among firm, industry, country effects and firm profitability for a period up to 18 years (1999-2017). I will divide the examination period into six parts, the first period is an expansionary period (1999-2000), second period is a relatively small recessionary period in 2001, the third period is an expansionary period (2002-2007), followed up with a fourth period which consists of a recessionary period (2008-2011). The fifth period ranges from 2012-2017, and finally an overall period covering all years in the sample (1999-2017). The purpose of separating the periods based on their economic characteristic is to assess the impact of firm, industry and country effect on firm profitability under various macroeconomic conditions. To differentiate my study even further, I will examine a different sample of economies, respectively developed countries and emerging countries in Latin-America.

I examine five hypotheses through a quantitative analysis in order to answer the research question. These hypotheses are based from past empirical research and corporate finance. The first hypothesis discusses the relative importance of firm resources and capabilities and how they have an effect on firm profitability. The second hypothesis concerns industry effects on firm profitability. This is followed up with a third hypothesis that relates to country effects on firm profitability. In addition, the fourth and fifth hypotheses are concerned with interest coverage ratio and the degree of operating leverage in relation return on assets. I use a sample of all countries in order to answer hypothesis one, two, four and five, then I split the sample into emerging and developed countries in order to answer hypothesis three.

Most past studies have used return on assets (ROA) to measure firm performance, therefore for comparability purpose, I also employ ROA. In order to add additional explanation to some of the variance in firm performance I will bring in elements from corporate finance, respectively interest coverage ratio and degree of operating leverage. This will add to previous research within the field of strategic management, who from my knowledge has only used ROA to measure firm profitability. Therefore, this thesis should be a useful contribution to the debate regarding the relative importance of firm, industry and country effects on firm profitability, by adding new knowledge to the research field.

This thesis is organized as follows. First a literature overview and hypothesis development are explored. The presentation of previous empirical findings will be the base of the hypothesis development. Next, the dataset and methodology are thoroughly described, followed by a chapter of the empirical results and discussion of the findings. Finally, I will end my thesis by presenting a conclusion.

2.0 Literature overview and hypothesis development

The field of strategic management have sought to understand the factors that drives and determine the differences in profitability among firms (Barney and Wright, 1986). The field is particularly interested in examining firms' resources and capabilities and other schools of thought that enable firms to generate economic rents. As such, the primary research topic of strategic management is understanding why some firms outperform others (Rumelt *et al.,* 1991).

It is argued by the father of industrial organization economics that there is a deterministic association between market structure and profitability (Mason, 1939). Firms within the same industry were thought to have the same strategical importance, except for scale, therefore the prime focus of analysis was the industry (Rumelt, Schendel, and Teece, 1991). As the subject of firm profitability has evolved over time, there are two basic explanations of performance heterogeneity that have been discussed over the years (Barney *et al.*, 2006). The Structure-conduct-performance paradigm (SPC) is one of these basic explanations. This paradigm focused on the structure of industries to explain heterogeneity in firm performance (Barney *et al.,* 2006). As such, industrial economics became the main theoretical pillar in the 1970's (Rumelt *et al.,* 1991).

The second basic explanation is known as the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991). This school of thought was developed in the 1980s´and became an important contribution in the field of strategic management (Rumelt *et al.,* 1991). The primary unit of the resource-based view analysis is the firms' resources and capabilities. Therefore, the theory focuses on the individual firm to explain differences in firm performance rather looking at the industrial environment. The resource-based view theory sought out to explain differences in firm performance within the same industry, something industrial organization economics failed to explain (Roquebert *et al.,* 1991). This view builds on the assumption that firms' resources and capabilities vary across firms, assuming firm heterogeneity. According to Barney (1991), firms' resources and capabilities that are valuable, rare, difficult to copy, and non-substitutable can lead to continuing firm differences and abnormal profits.

Nevertheless, despite that industrial organization economics and the resource-based view have had an important impact on the field of strategic management, they have failed to acknowledge the existence of the institutional environment. Institutional theory suggest that firms operate within a social framework which strive for social conformity, thus influencing organizations actions (Oliver, 1997). Therefore, institutional theory is incorporated in this thesis.

Past research focuses on firm vs industry, disregarding country effects on firm profitability. As noted, there are main theoretical pillars for firm vs industry debate, unfortunately there is no single theory that emphasizes country effects on firm profitability (Hawawini *et al.,* 2004). Therefore, a cross function of international business, international economics and finance will be applied in order to explain country effects on firm performance.

The following subchapters will present a theoretical fundament that will give a thorough explanation on the resource-based view, institutional theory, the industrial organization economics and country effects. The theoretical fundament will include previous empirical research concerning the role of firm, industry and country effects on firm performance and firm profitability. The hypotheses developed will be based on previous empirical findings as well as theory. In addition, the hypothesis concerning the interest coverage ratio and the degree of operating leverage will also be presented.

2.1 The resource-based view

Resource-based view has had an enormous impact on the strategic management field for over 20 years after it was first introduced by Wernedfelt in 1984. The essence of the resource-based view is that a firm's resources and capabilities generate high rates of return and sustainable competitive advantage. From this perspective, firm differences in high rates of return is a function of the firm's abilities to take advantage of imperfect and incomplete factor markets in developing strategic assets (Oliver, 1997). Furthermore, the resource-based view focuses on resource heterogeneity and immobility to gain sustained competitive advantage. Heterogeneity in turn, is a managerial decision and is often guided by economic rationality, efficiency, effectiveness, profitability and external strategic factors (Conner, 1991; Oliver 1997). However, it is important to emphasize that not all aspects of a firm attributes such as human capital and organizational capital are strategically relevant resources (Barney, 1991). Some attributes may even prevent a firm from conceiving of and implement valuable strategies (Barney, 1986b). Others may lead a firm to conceive of and implement strategies

that may reduce its effectiveness and efficiency, while others again have no impact at all (Barney, 1991). However, Wernerfelt (1984) suggested that firms that do have attributes that improve a firms' effectiveness and efficiency are a firms' resources.

To avoid possible confusion in the terms *firm resources*, *competitive advantage* and *sustained competitive advantage*, these terms will be defined in this section. In this thesis *firm resources* include *"all assets, organizational processes, firm attributes, knowledge, capabilities etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness"* (Barney, 1991, p 101). Thus, leading to a firm's sustained competitive advantage. A firm is said to have sustained competitive advantage when the firm is "*implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefit of this strategy*" (Barney, 1991, p 102). Thus, competitive advantage can only be retained as long as the firm's resources are unique over long periods of time, which means that sustained competitive advantage is not everlasting. Unanticipated changes in the economic structure of an industry may make a resource, that was at one time a source of sustained competitive advantage, no longer valuable to the firm, thus not a source of competitive advantage.

Barney (1991) suggested that in order to understand sources of sustained competitive advantage one must assume that firm resources are heterogeneous and immobile. Therefore, in order for a resource to have sustained competitive advantage, it must possess four attributes. It must be valuable, rare, imperfectly imitable and non-substitutional.

- Valuable: Firm resources are valuable when they improve firm efficiency and effectiveness. Firms are able to improve their performance when their strategies exploit opportunities and neutralize threats in its environment.
- Rare: A resource should also be rare amid a firm's current and potential competitors. If a firm's resources are not rare, then a large number of the competitors will be able to conceive and implement the same strategies. Therefore, these resources will not be a source of sustained competitive advantage.
- Imperfectly Imitable Resources: Resources that are valuable and rare have a distinct first- mover advantage. Lippman and Rumelt (1982) and Barney (1986a; 1986b) classified these resources as imperfectly imitable. However, in order to obtain sustained competitive advantage other firms cannot possess the same resources. In order for a resource to be classified as imperfectly imitable they need one or a

combination of the following three reasons. The first one being unique historical conditions. Resource that were developed due to historical events or over a long period of time are usually costly to imitate and difficult to replicate. The second reason for a resource to be imperfectly imitable is causal ambiguity. Casual ambiguity exist when a link between the resources controlled by a firm and a firm´s sustained competitive advantage is not understood or understood only very imperfectly (Barney, 1991). Finally, a firm's resources should be socially complex. The ability for other firms to imitate resources that are socially complex is significantly constrained. Examples of resources that are socially complex include the interpersonal relations among managers in a firm (Hambrick, 1987) or a firm's culture (Barney, 1986b).

- Non-substitutability: The last requirement for a firm resource to be a source of sustained competitive advantage is non- substitutability. In order for a resource to be a source of sustained competitive advantage is that there must be no strategically equivalent valuable resource that are themselves either not rare or imitable (Barney, 1991).

These four attributes give an indication of what degree a resource is heterogenous and immobile. Thus, giving an indication whether the firm's resource is a source of sustained competitive advantage or not. Together these four attributes make up the VRIN framework.

Although the resource- based view enable firms to generate above normal rates of return and a sustained competitive advantage, it has also been extensively criticized for many weaknesses. One of these criticisms is the assumption that sustained competitive advantage isn't actually achievable. In order to maintain sustained competitive advantage both the skills and the resource of the firm, and the way organizations use them, must continuously change over time. Thus, leading to the creation of continuously changing temporary advantages (Kraaijenbrink *et al.,* 2010; Fiol, 2001). This suggests that in order to maintain sustained competitive advantage firm's need to adapt faster than its competitors. Another criticism is that VRIN is neither necessary nor sufficient for the firm to gain a sustained competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). This implies that a resource can be a source of sustained competitive advantage without meeting the VRIN framework and that a resource that is within the VRIN framework not necessarily gives the firm a sustained competitive advantage. Therefore, a critique that have been made is that the resource-based view is tautological, and such too vague to fulfill the criteria for a true theory (Kraaijenbrin, Spender, & Groen, 2010).

Another criticism is the inclusiveness of the definition of a resource, which makes it difficult to derive whether a resource is an input to the organization. Despite considerable criticism, the resource based-view has become the most influential theory in strategic management (Kraaijenbrinl *et al.,* 2010).

In essence, the resource-based view tries to explain why some firms in the same industry differ in performance. The theory indicates that it is the firm itself that is the main source of profitability differences among firms. From this perspective, the firm's ability to generate high rents from resources and capabilities depends primarily on the firm's effectiveness in managing the social context of these resources and capabilities (Oliver, 1997). Rumelt (1991) empirical study suggested that firm specific factors dominated industry effects in explaining firm performance, thereby implying the resource-based view of strategy is the key to sustained competitive success.

2.2 Institutional theory

From an institutional perspective, firms operate within a social framework of norms, values and assumptions about what constitutes appropriate or acceptable economic behavior (Oliver, 1997). Institutional theory therefore concentrates on how firms operate within a certain social system (Bamiatzi *et al.,* 2016). Douglass C. North defined institutions as "the rules of the game in a society" (North, 1990, p. 3), meaning that forces within institutions give direction for organizations, processes and their decision making. Hence, institutions compromise all the formal and informal constraints that structure political, economic and social interaction within a system (North, 1990). Formal constrains consist of constitutions, legislation, treaties, court rulings, and standards, while informal constrains consist of shared norms, trust, customs and traditions and social conventions (Bamiatzi *et al.,* 2016).

Institutions tend to shape their strategic choices and decision-making process, along with the regular constraints of economics (North, 1991). Therefore, 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; Bamiatzi *et al.,* 2016). From an economic point of view, institutions reduce both transactions and information cost by reducing information asymmetry, adverse selection and moral hazard problems, by establishing a stable structure that facilitates interactions (Hoskinsson, Eden, Lau, & Wright, 2000). From this perspective, it is evident that institutionalism has great impact on firm strategic choices, which in turn affect firm performance.

Firm performance is rather constrained, not only by economic choices but also technological, information and income limits, as emphasized by neoclassical models (Oliver, 1997). Firms also depend on the constraints imposed by the institutional environment (Oliver, 1997). However, firms that comply to the social norms, and the acceptable firm conduct in the industry can gain the necessary legitimacy, which in turn gain resources and capabilities required for firm survival and sustainable development. Organizations that gain legitimacy are rewarded resources and survival capabilities (Meyer and Rowan, 1977).
Hence, institutional theory suggests that firms that structure their organization to comply to their institutional environment is fundamental for sustainable growth and performance (Bamiatzi *et al.,* 2016). As such, firm behavior does not only rely on rational and economically justifiable managerial decisions, but on compliance, as well as habitual and socially defined choices (Scott, 1987).

The resource-based view and industrial organization economics have both been criticized for largely ignoring the formal and informal institutional basis that provide the context of competition among industries and firms. Institutional environment has implicitly assumed to be relatively stable, unchanged, and irrelevant for firm heterogeneity, therefore the institutional environment has always been in the background (Peng *et al.,* 2008).
Since the resource-based view and industrial organization economics cannot in itself predict firm behavior and strategic choices, institutional theory is highly relevant for this thesis.

2.3 Merging institutional theory and the resource- based view

According to the resource-based view, it is the use of resources that are valuable, rare, difficult to copy, and non-substitutable that can lead firms to achieve sustainable competitive advantage and firm heterogeneity. However, it does not explain how firms make and fail to make rational resource choices in pursuit of economic rents. In addition, nor does the resource-based view examine the social context in which resource selection are made, and how this context might affect sustainable firm differences (Ginsberg, 1994).

It is argued that resource selection and sustained competitive advantage are influenced by the institutional context at the individual, firm, and interfirm level (Oliver, 1997). This suggest that a firm's ability to manage the institutional context of its resources will influence the firm's sustained competitive advantage. Which in turn will affect the potential for firms to earn economic rents.

Institutional theory suggest that organizations are relatively intractable and seek social conformity and approval in their environment (Scott, 1995; Zucker, 1987). However, even though social conformity is fundamental for social approval, it can lead to rigidity, impassiveness, and resistance to change (Oliver, 1997). This behavior can cause firms to be unwilling to imitate resources and capabilities. Especially resources that don't have legitimacy and social approval, which in turn reduce the potential for firm heterogeneity (Oliver, 1997). This type of behavior from firms can be destructive for firm performance, especially under economic shocks like recessions.

Past research has proposed that recessions act as a cleanser of the markets from firms that are not strong enough to withstand and survive turbulence in their competitive environment (Garcia-Sanchez *et al.,* 2014). Firms that do survive turbulence in their competitive environment exhibit sustainable profit advantages, high productivity levels, technological dexterity, and high levels of learning. Garcia-Sanchez *et al.* (2014) detected that recession makes industries more concentrated and generate changes in the structure of the industry. Therefore, firms that adapt to changes in their competitive environment are more likely to survive the long-term changes in the industry. Overall, recession compels firms to review their strategic choices in order to survive in a changing competitive environment, as well as restructure and reorganize their resources to gain the skill and resilience required for their survival (Oliver, 1997).

Increased uncertainty and changes in the institutional environment develop different assumptions regarding the true value of firm's strategic factors (Barney, 1986a). In economically distressed contexts, resources can become unequally distributed across firms, which in turn leads to different rent potential and heterogeneity (Bamiatzi *et al.,* 2016). The firm's financial flexibility becomes crucial for its performance, which can help firms cover their business cost and exploit growth opportunities (Bamiatzi *et al.,* 2016). In this case, firm specific effects become stronger for firm performance variations. Bamiatzi *et al.* (2016) found in their research that firm effects in recessionary periods are stronger, implying that firm specific strategies are important.

2.4 Recession and its impact on firm profitability and the institutional environment

The global financial crises brought organizations around the world to face the changes of the "rules of the game" and have led to high levels of financial distress and decreased economic

activity. Under recessions firms are faced with sharp decrease in revenues, budget reductions, while projects and purchases are put on hold, and hiring freezes (Luftman *et al.,* 2010). Thus, leaving firms, industries and countries around the world vulnerable to different events and risk. As the "rules of the game" are changing, it is particular important to focus on institutional theory, and how this school of thought is of relevance when assessing the impact of recession on firm profitability.

The last global financial crisis (2008-2010) led to severe credit deficit and illiquidity, thus resulting in sharp increase in transaction cost and firm resources (Lathman and Braun, 2008). Decline in resources lead to decline of productivity and competitiveness between firms, reduced efficiency, reduced profit margins and in several cases default (Richardson *et al.,* 1998; Bamiatzi *et al.,* 2013). Furthermore, the credit crunch that often symbolizes the beginning of recession results in increase in nominal interest rate and limitation of credit (Johnson, 1999). Firms are therefore dependent on external sources of funds for its liquidity which affect default risk of the firm (Richardson *et al.,* 1998).

The 2008 crisis had a direct and indirect effect on the informal and formal institutions in many countries. The United States responded to the crisis by purchasing short term bonds and selling long term bonds, following up with buying predetermined amount of government securities in order to stimulate the economy and increase its liquidity. Many countries in Asia and in Europe were affected by the crisis in the United States, even though their banks had little exposure to U.S securities. Japan and the United Kingdom responded by implementing the same strategies as the United States. Under the sovereign debt crisis in the European Union, the crisis brought implicit and explicit institutional changes within the European Union. Incentives to slow down the debt crisis included crisis management and a permanent change in ad hoc policymaking. Thus, adding new elements to the institutional organization. Schwarzer (2012) pointed out that these changes created path dependencies for further institutional changes and where an example of incremental institutional evolution.

The changes in firm performance during an economic shock will be influenced by external factors such as the development of the institutional environment. Chakarabarti *et al.* (2007), argued that firms in less developed institutional environments were likely to experience more difficulties during an economic shock. Because of these difficulties, many firms experience default. Furthermore, institutions were more likely to be less effective in providing resources during economic shock in less developed institutional environments (Chakarabarti *et al.,*

2007). It is clear that a global economic shock can bring turmoil in the institutional environment and change both informal and formal "rules of the game".

2.5 Findings from previous empirical research on firm profitability

Performance measure ROA

	Schmalensee (1985)	Rumelt (1991) (A*)	Rumelt (1991) (B*)	McGahan & Porter (1997)	Hawawini, Subramanian, & Verdin (2003)	Bamiatzi, Bozos, Cavusgil &Hult (2016)	
Firm effects	-	46,37%	45,80%	31,71%	35,80%	88,73%	
Industry effects	19,59%	8,32%	4,00%	18,68%	8,10%	7,83%	
Country effects	-	-	-	--	-	3,45%	
Error	80,4%	36,8%	44,8%	48,40%	52,0%	0%	

Table 2.1: Past empirical findings on firm performance

Past empirical research has given mixed results on the relative importance of firm, industry and country effects on firm performance. Table 4.4 shows past empirical findings from different researchers over the past decades. Schmalensee (1985), was the first to research the relative importance of firm and industry effects on firm profitability (Rumelt, 1991). Schmalensee's (1985) findings suggested that industry effects did exist and were substantial but found no evidence of firm effects. However, 80% of the variance in profitability remained unexplained, as well as the study was conducted on American manufacturing firms during a period of time of one year (1975). Rumelt (1991) tried to recreate Schmalensee's model by using two samples with a four-year time period (1974-1977). By analyzing a longer time period, Rumelt could correct Schmalensee's weakness, because with a longer time period Rumelt could incorporate stable and fluctuating effects. Rumelt divided the sample in two datasets, A and B. Sample A was constructed with the same data as Schmalensee while sample B contained additional firms. As we can see from table 4.3 both samples showed evidence of industry effects, respectively 8,32% and 4%. However, as opposed to Schmalensee's previous work, Rumelt's results showed large stable firm effects, showing that firms effects were more important than industry effects. McGahan and Porter (1997) tried to address a number of questions that were raised by previous research and relied on a broader

dataset (1981-1994). The study confirmed that firm effects followed by industry effects were the main source of firm profitability. In addition, they also found that industry effects were more persistent over time (McGahan and Porter, 1997). Hawawini (2003a) did also suggest that firm effects have a stronger influence in determining firm profitability (35,8%) followed by industry effects (8,1%). These findings were also supported by Bamiatzi et al. (2016) who found that firm effects were even more predominant (88,73%), followed by industry effects (7,83%) and country effects (3,45%). Bamiatzi et al. (2016) findings indicate that under economic downturn such as recession, firm effects are dominant and stronger, while industry effects become weaker. Indicating that a firm's own fate is self-determined (Short *et al*., 2007).

2.6 The industry-based view

Unlike the resource-based view that focuses on firm's resources and capabilities in order to sustain sustainable competitive advantage, industry-based view provides an alternative explanation. The industry-based view, also called industrial organization economics focuses on the importance of market structure in gaining firm profitability. While the resource-based view argues that firm heterogeneity is significant and persistent, industry-based view suggest that industry effect dominates over time (Mauri and Michaels, 1998). Schmalensee (1985) suggested that industry effects are more significant in explaining profitability variances between firms. Bain (1950, 1954) highlighted the importance of marked structure in shaping firm profitability and proposed that there is a linear relationship between market structure and firm conduct. Thereby establishing that market structure of an industry determines its conduct and thereby influences firm performances.

The structure conduct performance (SCP) paradigm, is a model in the industrial organization economics which explains firm performance through economic conduct on incomplete markets. The SPC paradigm imply that industry structure in which a firm operate is the main driver of performance variations (Mason, 1939). Structure in the SPC paradigm refers to the environment in a market in which a particular firm operates in. Conduct refers to the pattern of behavior followed by firms in adjusting and adapting to the markets in which they sell or buy (Bain, 1968). It refers to how buyers and sellers behave amongst themselves and between each other (Tung *et al*, 2010). Since conduct attributes to behavior and actions of the firm it includes the decision firms make and how these are taken, thus it is suggested that market conduct determines firm performance. Performance on the other hand, deals with the economic results that flow from the system in terms of its efficiency and flexibility to adapt in

changing situations (Bain, 1968). Thus, representing the economic results of the structure and conduct combined together. The SCP framework is based on the thought that the structural characteristics of the industry is unable to avoid the constrained conduct and strategies of firms. Which in turn, will lead to industry-specific performance differentials between firms (Mason, 1939).

Furthermore, industry-based view of the firm suggest that firms are an integral part of an industry, emphasizing that firm performance is tied up to the industry structure. Bamiatzi *et al.* (2016) claimed that the industry structure is exogenous, influenced by internal competitive forces, which included the number and size of the market concentration, the competitive rivalry of firms, the amount of product differentiation, the difficulties of entry and exit of the industry, accessibility of market information, and of course the cost of incurring the already established firms (Bain, 1950, 1951, 1954).

Michael E. Porter's five forces are based on premises derived from the SCP paradigm. Porters five forces is a widely used framework that evaluate the industry, and the impact of the industry on business strategy. The objective of this framework is to analyze how the firm needs to form its strategy in order to develop opportunities in its environment or protecting itself against competition within the industry and other threats. The five basic competitive forces are determined by strength in the underlying economic and technological characteristic of the industry (Porter, 1980). These competitive forces include threat of new entrants, bargaining power of buyers, rivalry between competitors, threat of substitute products and bargaining power of suppliers (Porter,1980). As such, the differences in profitability among firms is because of a firm's position among their competitors in the same industry (Porter, 1980; Scmalensee, 1985; Bamiatzi *et al.,* 2016).

There have been many discussions in the area of variance in firms' profitability, with numerous contributions to the management litterateur. Yet, researchers' in the field have debated on which effects are primary, because of the large differences in the studies, and methods used in the analysis. However, it has been revealed that industry effects do have an influence in shaping firm profitability (Short *et al*., 2009). Furthermore, Chang and Singh (2000) found that industry effects were higher when they included small firms, accounting for up to 54,2% of the total variance. As such, confirming the importance of firm size.

2.7 Merging industry-based view with institutional theory

The SCP framework points out that the structural characteristics of a market determines the behavior of firms within the specific market, and the behavior of firms within that market determines measurable market performance (Bain, 1951). In other words, it assumes that market structure determines firm conduct, which in turn determines firm performance (Bain, 1956) Yet, even though Bain (1951) incorporated institutional theory in the SCP paradigm, it has been little research on the role of the environment and how it may affect the industry structure performance relationship (Bamiatzi *et al.,* 2016).

In the context that industries evolve over time through a life cycle, these shifts from the life cycle to another in the industry will have an impact on the organizations environment. As such, the industry cycle has a significant impact on the performance of both industry and the firm. The different main stages in the industry cycle are growth, maturity, and decline (Miles *et al.,* 1993, Karniouchina *et al.,* 2013). Different authors postulate slightly different stages over the life cycle and include an earlier stage then the growth stage called "introduction" or the "ferment" stage. Since the ferment stage is the earliest stage in the life cycle, these firms are not publicly traded (Karniouchina *et al.,* 2013). As such, the ferment stage will not be included in this thesis, because this study will only include publicly traded firms.

The growth stage in the industry life cycle is characterized by a sharp market definition, high rate of new entrants that strengthens the competition within the industry, and severe demand fluctuation. Furthermore, this particular stage is characterized by high levels of heterogeneity, such as high product variations and unstandardized products (Mazzucato and Semmler, 1999). Because of the constant increase in competitive fields, new firms bring different resources and capabilities that create additional between-firm heterogeneity (Walker, Madsen and Carini, 2002). Indeed, these differences between resources and capabilities lead to considerable variance in market position (Tushman and Anderson, 1986) and profitability across competitors (Knott, 2003). As such, firm effects on firm performance is unavoidably stronger at the cost of industry effects (Karniouchina *et al.,* 2013).

In the maturity stage, low performing firms exit the industry and surviving firms simulate industry leaders (Klepper and Graddy, 1990). As such, the industry becomes more concentrated among the competitors that remain. Leading firms to become increasingly homogeneous in their capabilities and resources (Walker *et al.,* 2002). Furthermore, firms adopt more routinized practices that can improve and facilitate efficiency throughout the

supply chain of the firm (Bamiatzi *et al.,* 2016). Hence, the institutional environment such as established rules and norms of the organization becomes increasingly standardized. Firms start pursuing cost leadership strategies and price competition becomes much stronger. Since the maturity stage has limited intra-industry heterogeneity, industry effects on firm performance will tend to become more important in this stage as opposed to during the growth stage (Karniouchina *et al.,* 2013).

As the same time forces continue to intensify into the decline stage, the strongest competitors remain in the industry. The decline stage is characterized by strong rivalry as growth declines, and a few of the strongest competitors remain in the industry (Porter, 1980). In order for firms to survive and thrive in this stage, the surviving firms look to scale economies, international markets and other efficiency or process-oriented advantages to compete (Karniouchina *et al.,* 2013). Hence, the industry faces lower intra-industry heterogeneity, which in turn increases the importance of industry effects. This emphasizes the importance industry effects has on firm performance.

Nevertheless, the above findings cannot necessarily generalize to economic adversity such as recessionary periods, this is because industrial cycles differ fundamentally from economic ones. In addition, even though Karniouchina *et al.* (2013) argued that industry effects are stronger during an industry in decline, these findings apply under stable economic conditions. Economic turmoil affects the evolution of competition and firm advantages. As so, the life cycle can be considered to be "exogenously uncertain", and to some extent predictable (Garcia-Sanchez *et al.,* 2014). This can impose an extreme shift in demand and liquidity of financial markets (Calvo *et al.,* 2006). Furthermore, what characterizes economic recession is reduced economic activity, reduced access to capital and demand fluctuation (Claessens *et al.,* 2010). When an economic downturn takes place, it causes changes in the institutional environment and alter formal and informal institutions. As such, well prepared firms and firms that are flexible to changes in their environment can survive such unpredictable events.

Despite that recession can resemble a declining industrial environment, it does not reflect endogenous industry problems (Bamiatzi *et al.,* 2016). In recession, a decline in demand is temporary, while an industry in decline is often associated with its demise (Harrigan, 1980). Industry effects cannot be accounted for the performance of firms, but rather the strategic choices the organization make (Bamiatzi *et al.,* 2016). In addition, different industries remain almost impervious to the economic shocks in their industry, implying that the impact on firm

performance can be avoided or can be taken advantage of. Despite that, some firms choose retrenchment or to exit when industries are in decline as a strategic choice (Chakrabarti *et al.,* 2007; Harrigan, 1980), while other firms choose a different path. The most effective strategies for encountering recessions are innovation, new product development and customization (Gracia-Sanches *et al.,* 2014). Furthermore, as economic turmoil tests firms on their strategic choices and in turn affect their performance, other firms in their respective industries remain relatively stable as other firms emerge from economic instability. Bin Jiang *et al.,* (2009) found that healthcare and consumer staples that are vital regardless of the state of the economy, were not significantly affected by recessions. They did not have a significant change in their EBITA[1], implying as mentioned above that not all industries are affected by economic downturns.

It is evident that strong economic shocks change the formal and informal institutions and alter the "rules of the game" in the industry, and thus, change the structural dynamics which have an impact on demand and the internal competitive forces (Bamiatzi *et al.,* 2016). In this way, as the "rules of the game" are shifting, organizations have a greater need for firm specific strategies in order to survive uncertainties in the changing economic environment. Furthermore, individual firms are forced to depart from well establish and standardized strategic responses and rather apply different strategies with an intent to reduce the impact of industry effects (Bamiatzi *et al.,* 2016). Nevertheless, Majumdar and Bhattacharjee's (2014) research on institutional change and manufacturing profitability in India, found that manufacturing firms exhibited weaker industry effects in the time of the Indian institutional transition toward liberalization. In addition, Bamiatzi *et al.* (2016) research found that industry effects lost some of their explanatory power in determining firm profitability during recession. Thus, implying economic shocks have an effect on the industry and therefore firm performance.
Taking into account the resource-based view, industrial organization economics and the institutional theory my hypotheses are:

[1] EBITA= Earnings before interest, taxes and amortization

Hypothesis 1: Firm effects influence firm profitability stronger during recessionary periods as opposed to expansionary periods.

Hypothesis 2: Industry effects influence firm profitability less during recessionary periods as opposed to expansionary periods.

2.8 Country effects, emerging economies, and firm performance

Past research that has focused on variances on firm profitability have generally focused on industrial organization economics, institutionalism and the resource-based view. Nevertheless, researches have begun to expand their research on variances on firm profitability by investigating how much country effects matter in explaining differences in firm profitability.

Studies in international business, international economics and finance have provided evidence that the general contention that country effects diminish due to globalization is not entirely right (Bamiatzi *et al.,* 2016). Despite growth in international trade and international goods due to globalization, markets appear to be less integrated due to exchange rate risks and tariffs, cultural barriers, different legal systems and personal biases of the home country investors (Hawawini *et al.,* 2004b). As such, researchers are beginning to explore and review whether country effects influence firm profitability. I review evidence at a macro-economic level. It is also important to clarify that in this thesis, a firm's home country is where its stocks are traded, because most firms are listed on their domestic stock exchange.

It is important to distinguish between the three country biases that persist in international economics, the home country bias in internal trade, the home country bias in internal financing, and the home country bias in internal equity investments. As mentioned earlier, markets are less integrated than previously thought. Investors have a tendency to invest in home countries despite the benefits of diversifying into foreign equities. Chen (2000) examined border effects for a set of European countries and manufacturing industries. The study concluded that borders reduce trade among countries. Despite the overall integration process of the European Union (EU), trade within an Eu country was about 1.2 times and 3.6 timer greater than with another EU country. This gives support for McCallum's (1995) research arguing that that borders are in fact relevant, thus supporting the bias in internal trade. Obstfeld *et al.* (2000) argued that the reasons for this bias in trade are exchange rate risk, tariffs and non- tariff barriers.

Feldstein and Horioka (1980) identified the second bias in internal trade. Their research shed light on the average national saving raters by OECD countries over a long period of time, which turned out to be highly correlated with averages of domestic investment. Obstfeld and Rogoff (2000) found out that this correlation still remains strong, thus investors do not always seize the highest rate of return but rather have priority to invest in their own home country. The reason for this is that cross-border investments entails much of the risk investors come across with cross-border trade, risk such as tariffs, non-tariff barriers, and exchange rate risk (Obstfeld *et al.,* 2000).

Finally, the third home country bias concerns internal equity investments, which is the effect of home country on equity portfolios of investors. In classic finance, rational investors could diversify their portfolio internationally to reduce their unsystematic risk (Hawawini *et al.,* 2004b). Nevertheless, this is not the case as French and Poterba (1991) demonstrated. Their study found that in the US, citizens held 94% of their equity investments in US stock, and in Japan this figure reached 98%. This further emphasizes the home country bias in internal equity investments. Investors tend to invest equities in their home country, despite that a diversified international portfolio would yield lower risk.

The evidence presented above shows how biases can affect investors rational portfolio decisions. At a macro level, one can suggest that investors are influenced by home country factors, thus influencing firm performance due to the home country bias in demand and capital cost (Hawawini *et al.,* 2004b).

However, the research of Hawawini *et al.* (2004b) found that country factors contribute little to explain firm performance (0.2%). Thus, one may argue that country effects does not have an impact on firm performance (Bamiatzi *et al.,* 2016) This is because empirical research has been measuring the economic environment as an interaction term, which means that country year effect has been capturing specific economic factors linked to transient effects. The economics factors are capturing the year effect in each country, thus making these effects insignificant. Nevertheless, Chakrabarti *et al.* (2007) examined the strategy firm-performance relationship during a relatively stable economic period and during an economy-wide shock in emerging economies. Their research uncovered that in emerging economies informal institutions are often shaped to cover for the weaknesses of unsophisticated financial and institutional mechanism (Bamiatzi *et al.,* 2016; Khanna and Rivkin, 2001).

At a macro-economic level, countries differ in the stages of economic development, such as emerging economies and developed economies (Peng *et al.,* 2008). Emerging economies possess a lack of established institutional systems and are characterized by high market growth rates and short histories of economic liberalization (Makino *et al.,* 2000). However, emerging economic regions also possess underdeveloped capital markets, scarcity of skilled labor and lack of valid market information, that make market transactions less efficient (Makino *et al.,* 2000). Khanna *et al.* (2001) argued that emerging markets also exhibit high levels of corruption making emerging markets riskier to foreign competitors. Furthermore, Tong *et al.* (2008) argued that these markets are rather unique due to their imperfections and strong family conglomerates that dominate trade within their markets. Family conglomerates are large, diversified and family owned businesses that are dominant players in emerging markets, making them excellent business partners (Daekwan *et al.,*2003).

As such, it is clear that the differences between emerging economies and developed economies can only result in unequal growth opportunities (Majumdar *et al.,* 2014; Peng, 2003). Makino *et al.* (2004) found that country effects in emerging economies accounted for higher variance in profitability (7.7%), than in developed economies (3.6%). MacGahan and Victer (2010) researched the relative importance of home country and firm influences on corporate profitability and demonstrated that in low-income countries, country effects explain 4.6% of the total variance in profitability, but decrease to 1.7% in countries with high incomes. Bamiatzi *et al.'s* (2016) research found that country effects are stronger in emerging economies, explaining 4.42% of the total variance in ROA.

It is clear from past empirical research that there is evidence that country effects in emerging economies have an impact on firm profitability. As such, considering the above arguments that country specific factors do have an effect on firm performance, my third hypothesis is:

Hypothesis 3: Country effects in emerging economies have a stronger impact on firm profitability

2.9 Interest coverage ratio

The interest coverage ratio is used to determine the company's ability to pay interest on its outstanding debt (Berk & DeMarzo, 2016). In other words, it provides a quick picture of a company's ability to pay its interest. A company that thrives and sustains earnings above its

interest has a better position to withstand economic shocks. By contrast, a company that barely manages may have difficulties to cover its interest cost, which means that the company is less able to withstand a recession.

Lenders, borrowers and creditors are especially interested in the interest coverage ratio as they can assess a firm's ability to pay their interest obligation and asses their debt capacity. A ratio that is often considered is the firm's EBIT, which serves as a multiple of the firm's interest expenses. A high interest coverage ratio suggests that the firm is experiencing high profits, which implies that its profits is greater than for the firm's annual interest expenses. Hence, a high interest coverage ratio suggests a low likelihood of default and strong financial health. On the contrary, a low interest coverage ratio indicates a firm experiencing low earnings and the risk of bankruptcy is relatively high. A firm with a high interest coverage ratio will have a ratio in excess of 5, and a firm with an interest coverage ratio 1,5 or lower suggest that the firm's ability to meet its obligations are questionable (Berk & DeMarzo, 2016).

Since a high interest coverage ratio suggests that a firm is in good financial health and its earnings are higher than its interest expenses, my fifth hypothesis is:

Hypothesis 4: Firms with high interest coverage ratios experience higher return on assets.

2.10 Degree of operating leverage

Operating leverage refers to the division between fixed and variable cost and is a determinant for business cycle sensitivity (Bodie, Kane & Marcus, 2014). A firm will be less sensitive to market fluctuations when it possesses a great amount of variable compared to fixed costs. This can be seen in light of recession, where firms with higher variables are able to reduce their output cost when sales are tumbling. However, firms with higher fixed cost will have profits that fluctuate more broadly with their sales. The reason for this is because most costs do not change to counteract revenue variability. In addition, firms with high fixed costs experience high operating leverage because small fluctuations in business conditions may have a large influence on firm profit.

We can measure the quantity of operating leverage by looking at the degree of operating leverage that measures to what extent firm profits are sensitive to changes in sales (Bondi, Kane & Marcus, 2014). In addition, operating leverage can influence market risk of the firm, thus leading firms with high operating leverage to a higher beta (Berk & DeMarzo, 2016; Damodaran, 1999). This can have an impact on future strategic choices as many firms will

aspire to reduce its operational investments. This act will reduce the firm flexibility under economic hardship, thus exposing the firm to much more risk (Damodaran, 1999).

Since a higher degree of operating leverage can be associated with higher profits my sixth hypothesis is:

Hypothesis 5: Firms with a higher degree of operating leverage will experience higher return on assets

3.0 Methodology and data

This chapter will give a thorough explanation of the method applied in this thesis. Furthermore, I also explain how I have retrieved the dataset and conduct several validity tests on the dataset to test the robustness of the results.

3.1 Dataset

The dataset in this thesis is retrieved from Thomson Reuters Eikon, which includes more than 54,500 active companies and 22,500 inactive companies across 120 countries (Thomson Reuters, n.d). The statistical measurement that is used in order to select a sample of developed countries is the Human Development Index (HDI) 2018. This statistical measurement measures the development of a country in both economic and social terms, and not economic growth alone such as GDP. The countries selected in this sample are countries with the highest HDI which include, Norway, Switzerland, Singapore, Australia, and Belgium.

One of the requirements in choosing the sample of emerging countries in Latin-Amerika is a strong capital market in order to retrieve reliable data such as ROA. Therefore, I have used the MSCI Emerging Markets Index which classifies markets with respects to three criteria, economic development, size and liquidity and market accessibility. MSCI defines Chile, Brazil, Peru, Colombia and Mexico as emerging countries in Latin- Amerika.

In order to examine emerging and developed countries, I classify the industries in country origin and use an industry classification which is representative for all countries in the sample. To classify the industry, I have chosen to use Thomson Reuters Business Classification (TRBC), owned and operated by Thomson Reuters (Thomson Reuters, m.d). The classification system is a market-based classification system where companies are assigned an industry on the justification that they serve one specific market rather than the product or service they offer. TRBC is a five-level hierarchical structure consisting of 10 economic sectors, 28 business sectors, 54 industry groups, 136 industries and 837 activities. The firms selected in this thesis are from the economic sector which consists of: 50 Energy, 51 Basic Materials, 52 Industrials, 53 Cyclical Consumer Goods & Services, 54 Non-Cyclical Consumer Goods & Services, 55 Financials, 56 Healthcare, 57 Technology, 58, Telecommunications Services and 59 Utilities.

As mentioned earlier, I test hypothesis one, two and four by using all countries in the sample. In order to test hypothesis three, I split the dataset into emerging and developed countries. In

addition, the dataset is divided into six different time periods based on the annual global GDP growth rate. This is because GDP is often the technical indicator that is used to determine if there is a significant decline in economic activity. Figure 3 (a) displays the annual global GDP growth rate for the years 1998- 2017. The first period is an expansionary period covering 1999-2000. As visualized in figure 3.1, this period is characterized by high GDP growth which expands until it reaches a peak. The pattern is consistent with figure 3.2 which displays the mean annual GDP growth rate for the two country groups. The strong decline in annual GDP growth rate in 1998-1999 reflects the economic crisis in the emerging countries, nonetheless, the crises did not have an effect on the developed countries. Hence, we have a significant gap in the period 1998-2000. In 2001 there was a decline in the annual global GDP growth rate from 4,4 percent to a mere 1,9 percent in 2001. The small recession lasted only two quarters and was mostly due to the dot-com bubble and 9/11 attack. Despite fall in the annual GDP growth rate the recession was brief and shallow (Kliesen, 2003). However, it still affected the developed and emerging countries. Therefore, I investigate further by looking into the 2001 recession as a period. Furthermore, we witness a relatively long expansionary period between the period 2002-2007. This period is also consistent with figure 3.2. The long expansionary period (2002-2007) was followed with a sharp overall decline in annual global GDP growth rate in the period 2008-2011, displaying the strongest recessionary period in many years. Even though the period 2008-2011 extends the decline in annual GDP growth rate, I believe this period can capture the after-effects of the 2008 recession. I also include a recovery period ranging from 2012-2017. Even though the GDP growth rate visualized is highly volatile, it is important to take into consideration that in the recovery period (2012-2017) the GDP growth rate is more stable. In addition, I include a period covering all years in the sample, ranging from 1999-2017.

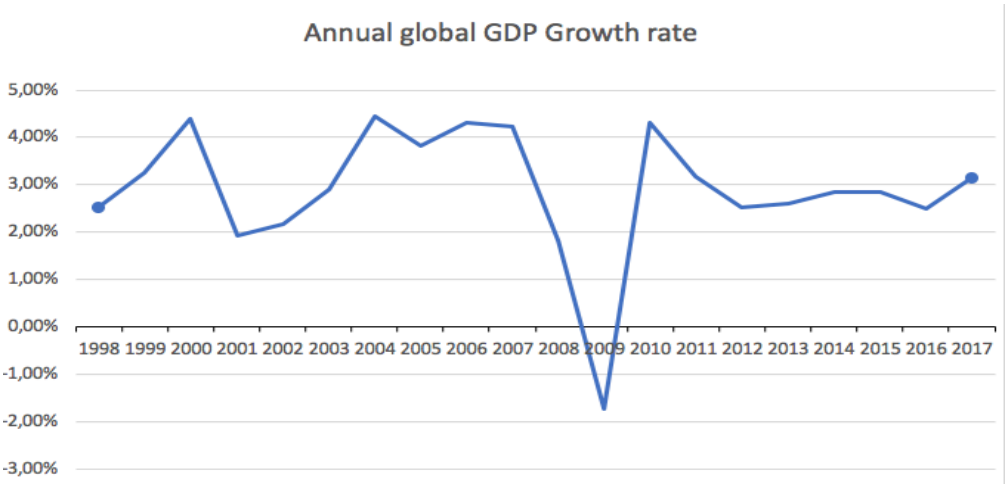

Figure 3.1: Annual GDP Growth rate for the period 1998-2017.

(Source: Adapted from the World Bank)

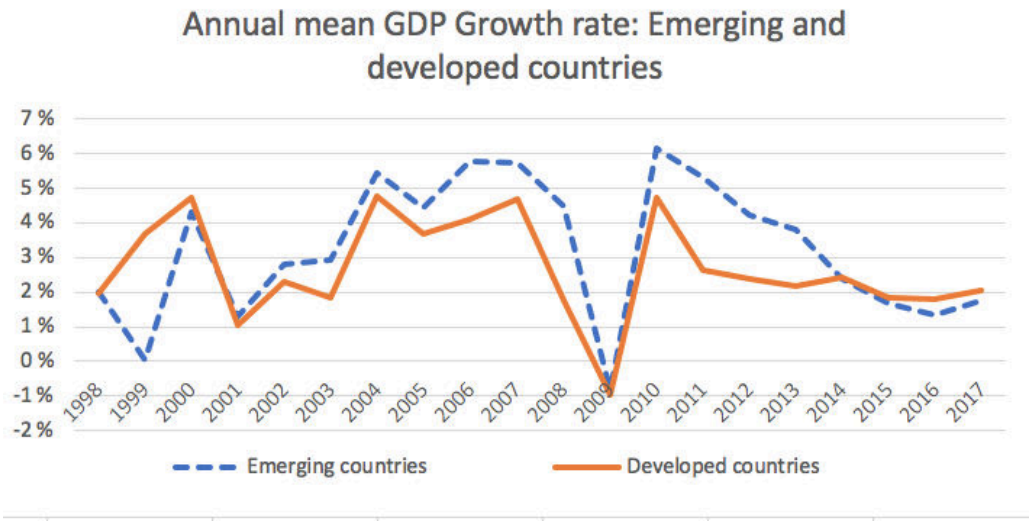

Figure 3.2: Mean annual GDP Growth rate for emerging and developed countries.

(Source: Adapted from the World Bank)

Various studies in the past have mainly measured firm performance using return-on assets (ROA). Therefore, I also choose to employ ROA for each examined period. In addition, the model includes two fixed effects, namely interest coverage ratio and degree of operating leverage.

The first fixed effect included in the model is the interest coverage ratio (ICR) and is incorporated in all the time periods examined. The interest coverage ratio gives a quick picture of a firm's ability to pay interest on its debt and is calculated as EBIT divided by the firm's interest expenses (Berk & DeMarzo, 2016). In order to calculate the interest coverage

ratio, I have retrieved EBIT per fiscal year and interest expenses per fiscal year from Thomson Reuters Eikon. The equation is presented below:

$$Interest\ Coverage\ Ratio = \frac{Earnings\ before\ interest\ and\ taxes\ (EBIT)}{Interest\ expense}$$

The second fixed effect included is the degree of operating leverage, which is a function of the cost structure of the firm. The degree of operating leverage is defined as the relationship between fixed and total cost (Damodaran, 1999), which is calculated as the percentage of change in EBIT divided by percentage of change in sales (Berk & DeMarzo, 2014). I have retrieved EBIT per fiscal year and total revenue per fiscal year from Thomson Reuters Eikon. The formula is presented below:

$$Degree\ of\ Operating\ Leverage = \frac{\%\ change\ in\ EBIT}{\%\ change\ in\ total\ revenues}$$

3.1.1 Limitations set in the dataset

As mentioned earlier, for comparability purposes I have employed ROA in order to asses firm performance. Since the dataset consists of 4770 companies over a period of eighteen years, it is subject to outliners which can distort the interpretations of the data. In order to avoid particular extreme values and have values that represents the average firm, I have investigated which rates of ROA that is normally representative for most firms in its industry.

Return on assets can be difficult to compare across industries. This is because companies in different industries vary in their use of assets. While some industries require expensive plant and equipment, other companies like software do not require much equipment, thus producing high ROA (Corporate Finance Institute). The Corporate Finance Institute has a general rule that a ROA under 5% is considered an asset-intensive business, while a ROA above 20% is considered an asset-light business. Therefore, I deem it appropriate to set a limit at +/-60% ROA for the firms in the sample. I have chosen to set a limit +/- 60% for ROA for the firms to exclude values that can mislead and distort the average firm, while at the same time making the dataset more representative for the average firm.

Since my dataset consist of eighteen years some firms will not have a complete data for the entire period examined. In order to ensure that the dataset is representative I have not excluded these firms, therefore avoiding selection bias. Because of this, different time periods in the dataset will also contain different amounts of firms. As such, I choose not to remove

those firms in the sample because firm entry and exit is a natural part of the industry. Therefore, I find it appropriate to keep these firms in the sample.

3.2 Hierarchical linear modelling

I have tested the multilevel framework of firm, industry, and country effects on determining firm profitability by using hierarchical linear multilevel modelling (HLM). A three-level model has been applied to test the effects of firm (level 1) nested within the effects of industries (level 2) nested within the effects of countries (level 3).

HLM is an ordinary least square regression-based analysis that takes into account the structure of the data which are nested, thus violating the independence assumption of OLS regression. This is because the cluster of observation are not independent of each other. This means that firms are nested in industries and industries are nested in countries, which makes this technique appropriate for the analysis.

One of the benefits of the model is that it takes into consideration the independence of errors assumption that might be violated by an OLS regression, or other models (Short, McKelvie, Ketchen, & Chandler, 2009). This is because of its ability to handle a hierarchical structure of data. The model flexibility with data input is another benefit of this technique. The model does not need a balanced dataset in order to obtain results, thus enabling estimations of both fixed and random effects (Short *et al.,* 2009). Furthermore, the technique can capture the effects of higher levels constructs on lower level constructs, therefore explaining the relationship among multiple constructs (Hoffmann, 1997). This creates an interdependence among lower level observations in the nested structure of the data (Ozkaya *et al.,* 2013). When variables are assigned in each of their appropriate level it enables for a better modeling of the underlying relationships across the variables (Bryk and Raudenbush, 1992).

Nonetheless, even though HLM is a solid framework it has its limitations and disadvantages. First of all, it requires a large sample of data to generate adequate results especially in level 1 (Ozkaya *et al*., 2013; Woltman, *et al.,* 2012). As mentioned earlier, in this thesis level 1 is firm effects which consist of 4770 firms. As such, I believe this number of firms is adequate, making this limitation not of relevance and therefore avoiding the disadvantage. At level 2 and level 3, the model will remove groups with missing data (Woltman *et al.,* 2012), which in this thesis is industry at level 2 and country at level 3. Since every firm in the sample is assigned an industry and country classification there will be no missing data at level two and level three. Therefore, I believe that this disadvantage is not of relevance.

3.3 HLM assumptions and validity test

Like many other technical models, the hierarchical linear model must satisfy a set of assumptions. These assumptions are a linear relationship in parameters, homoscedasticity, and a normal distribution of the residuals (Maas *et al.,* 2004). In addition, I test for the occurrence of high intercorrelations among independent variables by conducting a multicollinearity test.

3.3.1 Outliers and influential observations

In order to investigate outliers in the dataset, I use scatterplots of the interest coverage ratio, degree of operating leverage and their standardized residuals. I have also listed the standardized residuals that are larger than ± 3, which can indicate an extreme observation. As presented in appendix 1a, I found three outliers in the scatterplot of the interest coverage ratio and three standardized residuals that where larger than three in the samples of all countries (appendix 1a). As for the emerging countries, I found several outliers in both scatterplots for the interest coverage ratio and degree of operating ratio which are displayed in appendix 1b. There is also one large standardized residual.

In addition, I use Cooks distance to find influential observations, the Cooks distances that are large are presented in appendix 1. I compare Cooks value for each observation with the criterion 4/n, where n is the number of observations in order to examine whether these outliers have any influence or not. The sample for all countries has two Cooks distance that are large, but none of the Cooks distance measures in the sample for emerging countries are significantly large.

In order to examine whether these outliers were influential or not, I ran the analysis with and without the outliers included in both samples. I then compared the findings between the model with the outliers and without the outliers. As expected, in a large dataset the outliers do not have a significant effect on the fitted line. Most of the residuals are close to zero, as well as their leverage is low. The standardized residuals that are large (± 3) does not have a significant effect on the parameters. Since the parameters are not affected in a notable extent, I decided to keep the observations in the sample. I display the difference in the coefficients in appendix 1.

The same procedure is followed in all periods, in both the sample of all countries and emerging countries. In the sample of emerging countries, the period 2001 and 2008-2011, I find outliers that are influential in both scatterplots for the interest coverage ratio and degree

of operating leverage. By following the same procedure for these outliers, I find considerable changes in the parameters. Therefore, I decide not to keep these observations in the dataset as they are affecting the parameters and results in a notable extent.

3.3.2 Linearity

To test for linearity, I have created scatterplots for all the variables in a matrix for both samples. The matrices are presented in appendix 2. As displayed in the matrix, I find no indication that the dependent variable and the explanatory variable are non-linear.

3.3.3 Normal distribution

To test if the residuals in the sample have a normal distribution, I use a Kernel density graph and conduct a Shapiro Wilk W test for normality. The Kernel density estimated graph and Shapiro Wilk W test are portrayed in appendix 3 for all countries and emerging countries. As portrayed, the residuals of the models do not follow a normal distribution. The reason for this is that real world data such as economic data are not normally distributed (Box, 1979). Furthermore, the models exhibit fatter tails and excess peakedness at the mean, which indicate that the models exhibit a leptokurtic distribution with a kurtosis of 7,87 in the model for all countries and 14,56 for the emerging countries. In addition, both models exhibit fatter tails and negatively skewness of -1,42 for all countries and -1,98 for the emerging countries. Even though the residuals in both models deviate from a normal distribution, Schmidt and Finan (2017) argued that they still may not interfere with a valid estimation, especially for large samples. As such, considering that the models have a large sample, I believe that the model can still produce valid results.

3.3.3 Heteroscedasticity

In order to test for heteroscedasticity, I have conducted a White's test for both models, as well as two-way scatterplot. The tests and the two-way scatterplots are presented in appendix 4. As displayed in appendix 4, there is no indication of heteroscedasticity in both models.

3.3.4 Multicollinearity

In order to test if the explanatory variables are highly correlated with each other, I conduct a multicollinearity test. The results are displayed in appendix 5. As displayed in appendix 5, the VIF stands for variance inflation factor and values greater than 10 deserve further attention. The function 1/VIF is the degree of collinearity where the value lower than 0.1 is equivalent of a VIF of 10. I conducted the multicollinearity test on the sample of all countries and

emerging countries and found no indication of correlation among the variables. As displayed, the model has a VIF under 10, more specifically 1.0, and 1/VIF larger than 0.1, which suggest that there is no indication of multicollinearity. In addition, I have also tested the bivariate correlation among the variables in both models and found no noteworthy correlation. I conclude that there is no problem of multicollinearity.

3.4 Model estimation

As explained earlier, I use a three-level mixed effects model where level 1 is representing firm effects, level 2 industry effects, and level 3 country effects. The mixed effects model also include fixed effects which are, the interest coverage ratio and degree of operating leverage. As for the variable effect, I use mean return on assets (ROA).

As expressed in equation 1 the variable effect is ROA for each company examined as a function of industry mean, interest coverage ratio, degree of operating leverage and random error.

(1) $$ROA_{fkc} = \delta_{0kc} + b_1 ICR_{fkc} + b_2 OPL_{fkc} + \varepsilon_{fkc}$$

ROA_{fkc} refers to the average ROA of the firm f, nested in industry k which in turn is nested in country c. The coefficient δ_{0kc} represents level 1 which is the intercept (firm effects). Furthermore, ε_{fkc} is a random firm effect which constitutes the deviation of firm $fkc's$ score from the industry mean. The effects are presumed to be normally distributed with a mean of zero and variance σ_f^2 (Subedi, 2005). The coefficient $b_1 ICR_{fkc}$ is the interest coverage ratio of firm $fkc's$, whereas $b_2 OPL_{fkc}$ is the $fkc's$ degree of operating leverage. The symbols f, k and c, specify and represent firms, industries and countries with $f = 1, 2 \dots \dots, n_f$, firms within industries $k; k = 1, 2, \dots, n_k$ industries within countries $c; c = 1, 2, \dots, n_c$.

The level 2 industry model concerns industries. The model assesses the variability through industries with the industry mean (δ_{0k}) varying randomly within a country's mean.

(2) $$\delta_{0k} = \alpha_{00k} + q_{0k}$$

Where α_{00k} represents the grand mean, which is the mean industry ROA within a country, and q_{0k} is a random industry effect. The random industry effect is the deviation of an industry $k's$ mean relative the country mean. As mentioned earlier, these effects are assumed to be normally distributed and have zero mean and variance σ^2 (Subedi, 2005).

(3) $$\alpha_{00k} = \omega_{000} + u_{00c}$$

Where ω_{000} represents the grand mean and u_{00c} is a random country effect, which is the deviation of a country's $c's$ mean from the grand mean. Yet again, these effects are presumed to be normally distributed and with a mean of zero and variance σ^2.

Overall, the model becomes:

(4) $$ROA_{fkc} = \omega_{000} + q_{0k} + b_1 ICR_{fkc} + b_2 OPL_{fkc} + u_{00c} + \varepsilon_{fkc}$$

The equation (4) above express the objective of the three-leveled model, and the purpose is to divide the variability in ROA_{fkc} into each of the three levels in the hierarchy; among firms within industries (level-1 σ_f^2), among industries (level-2 σ_δ^2), and among countries (level-3 σ_α^2). The model is applied in each of the six-periods mentioned, 1999-2000, 2001, 2002-2007, 2008-2011, 2012-2017 and a period covering all years in the sample ranging from 1999-2017.

Even though the hierarchical linear model does not provide a significant test for within group variance, the model does present the amount of variance in ROA among group components (Hoffman, 1997). Therefore, one can calculate the intra-class correlation coefficient (ICC), which represents the percent of variance in ROA among firms. The ratio of the between group variance to the total variance is the intra-class correlation coefficient (Hoffman, 1997). The intra-class correlation coefficient for the industry effects at level 2 is calculated as:

$$ICC_k = \frac{\sigma_k^2 + \sigma_c^2}{\sigma_c^2 + \sigma_k^2 + \sigma_{residuals}^2}$$

The subscript c and k stand for country and industry, respectively. The intra-class correlation coefficient for country effects level 3 is calculated as:

$$ICC_c = \frac{\sigma_c^2}{\sigma_c^2 + \sigma_k^2 + \sigma_{residuals}^2}$$

Finally, we can calculate the inter-class correlation coefficient for firm effects level-1 as:

$$ICC_{firm} = 1 - ICC_k - ICC_c$$

I assume that the variance in firm profitability is not explained by industry effects or country effects. Therefore, by subtracting the intra-class correlation coefficients of industry effects and country effects, we get firm effects.

4.0 Results

In this chapter, I first present preliminary findings of the impact of recession on the world economy. Data is retrieved form the World Bank and focuses on the annual global GDP growth rate as well as the annual global GDP growth rates of the emerging and developed countries. In addition, I present past empirical findings on firm profitability. I have also retrieved information on global market capitalization. Finally, the result from the analysis is presented.

4.1 GDP and ROA for different time periods

As mentioned before and visualized in figure 4.1, in 2001 the world GDP growth rate declined from 4,39% to 1,91%, as compared to the emerging and developed countries who experienced a stronger decline. Even though this is a relatively small period, the market capitalization declined with 32 %, which indicate that even a short recession can have impact on the global economy. In addition, the global GDP growth rate in the period of 2002-2007 was rather volatile but was around 2%-4%, which then declined to a mere -1,73% in 2009. For the emerging countries, the annual GDP growth rate was around 5% and also experienced a strong decline during the recession (-0,85%). The developed countries had an annual GDP growth rate between 2% and 4%, which also turned negative in 2009 (-0,97%). Therefore, it is clear that the 2008 recession had a severe impact on the global economies. This is further emphasized by the sharp decline in the global market capitalization, which fell from USD 60.305 trillion to USD 32.268 trillion from the period 2007 to 2008.

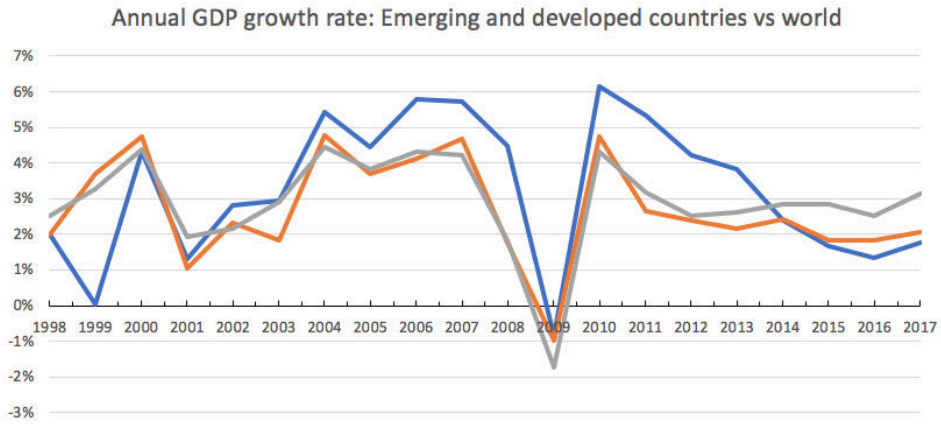

Figure 4.1: Annual GDP growth rate of the emerging countries and developed countries vs the world (1998-2017)

(Source: Adapted from the World Bank)

When examining firm profitability over the past years, there is a similar pattern which is presented in table 4.1 for the entire sample and for each of the two subsamples of emerging and developed countries. As presented, there is a decline in mean ROA in 2001 and 2008 for the full sample as well as mean ROA in emerging and developed countries. Firms in emerging countries experienced higher mean ROA than the developed countries. However, firms in emerging and developed countries both experienced a decline in mean ROA under the recessions in 2001 and 2008. Both emerging and developed countries experienced similar patterns as the world.

	Full sample		*Emerging countries*		*Developed countries*	
Year	***Mean ROA (%)***	***Median***	***Mean ROA(%)***	***Median***	***Mean Roa (%)***	***Median***
1999	1,52%	2,95%	1,98%	2,93%	0,34%	2,77%
2000	0,86%	2,59%	2,81%	2,48%	1,30%	2,79%
2001	-1,04%	1,52%	2,37%	2,15%	-2,76%	1,16%
2002	-0,75%	1,60%	2,12%	2,11%	0,49%	1,69%
2003	0.98%	2,64%	3,41%	3,00%	2,36%	2,96%
2004	1,74%	3,65%	5,26%	4,50%	2,88%	3,81%
2005	2,20%	3,97%	5,66%	4,60%	2,10%	3,83%
2006	2,59%	4,11%	5,87%	4,59%	2,71%	4,16%
2007	1,64%	3,74%	5,71%	4,94%	1,23%	3,30%
2008	-1,33%	1,45%	3,51%	3,08%	-1,68%	0,73%
2009	-0,54%	2,10%	4,54%	3,77%	-0,89%	1,62%
2010	0,70%	2,85%	5,51%	4,65%	0,14%	2,26%
2011	0,27%	2,37%	4,23%	3,94%	0,16%	1,84%
2012	0,33%	2,23%	3,52%	3,32%	0,48%	1,89%
2013	0,34%	2,09%	3,08%	2,96%	0,67%	1,95%
2014	1,27%	2,26%	2,48%	2,51%	0,59%	1,97%
2015	0,95%	1,88%	1,44%	2,10%	0,43%	1,68%
2016	1,15%	2,23%	2,17%	2,57%	0,45%	2,00%
2017	0,99%	2,29%	2,67%	2,97%	0,14%	1,77%

Table 4.1: Year and performance statistic for the full sample, emerging and developed countries

When examining mean ROA for each country, it becomes clear that there is an individual difference in firm performance. As presented in table 4.2 there was a noteworthy decline in mean ROA between the expansionary periods and recessionary periods. Furthermore, Colombia and Brazil did however experience an increase in mean ROA between the expansionary period (2002-2007) and the last recessionary period (2012-2017). This is very interesting but will not be discussed or examined further in this thesis. As for the developed countries, they all shared a similar pattern as the global economy, a decline in mean ROA.

Australia however, exhibits a negative mean ROA in all the periods presented, which is also interesting as the negative mean ROA is smaller during recessions. From the above findings it becomes even clearer that global recessions did have an effect on firm performance on all the countries in the sample.

Mean ROA Country

Emerging countries	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Chile	3,2%	2,2%	5,6%	4,1%	3%	4,4%
Peru	1,95%	0,92%	6.9%	6,53%	3,6%	4,6%
Mexico	5,6%	1,8%	5,95%	3,5%	2,7%	3,5%
Colombia	0,6%	0,56%	4,25%	4,81%	3,6%	4%
Brazil	-0,164%	0,52%	2,9%	4,2%	0,92%	2%
Developed countries						
Switzerland	5,6%	0,48%	3,2%	2%	1,7%	2%
Belgium	2,8%	0,31%	3,1%	1,5%	1%	0,5%
Norway	-0,74%	%	0,75%	-1,6%	-1,5%	-2,2%
Australia	-6.13%	-1,57%	-9,4%	-1,12%	-1,1%	-12,7%
Singapore	2,88%	0,15%	6,01%	3,5%	0,91%	2,5%
Emerging economies	2,1%	3,2%	4,9%	4,5%	2,4%	3,4%
Developed economies	-1,3%	-2,8%	-3,6%	-5,3%	-5,8%	-6,3%

Table 4.2: Performance statistics per country

Mean ROA Industry

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)
Basic Materials	-4%	-1,3%	-8,27%	-11,17%	-14,36%
Consumer Cyclical Goods & Services	1,8%	0,6%	4,3%	3,1%	1,9%
Non -Consumer Cyclical	2,2%	1,1%	2,9%	2,4%	1,07%
Energy	-11,35%	-1,3%	-11,18%	-11,28%	-15,14%
Financials	3,4%	0,3%	4,2%	1,7%	2,3%
Healthcare	-6%	-1,9%	-10,5%	-8,9%	-10,6
Industrials	2,3%	0,03%	3,6%	2,3%	1,1%
Technology	-3,1%	-1,5%	-3,4%	-7,5%	-5,6%
Telecommunications Services	-0,031%	-1,09%	-0,2%	5,8%	-2,4%
Utilities	0,7%	0,6%	2,8%	3,6%	2,3%

Table 4.3: Performance statistics per industry

In addition, when examining the industries separately in each period there is a pattern that is quite similar to table 4.2. In table 4.3, performance statistics for each industry in every period

are presented. Most of the industries experienced a decline in mean ROA, in exception for telecommunications services and utilities, which experienced an increase in mean ROA in the period 2008-2011. Consumer cyclical is highly correlated to the state of the economy, and as we can see in table 4.3 there was a decline in mean ROA between the expansionary periods and the recessionary periods. When economic conditions are in decline, consumers are less willing to spend their money on non-essentials. Furthermore, even though healthcare has a negative mean ROA in all the periods, they experienced an increase in mean ROA during recessionary periods. The reason for this is because that healthcare is a necessity, therefore not significantly affected my recessions.

The above preliminary findings indicate that different stages in the economic development has an impact on firm profitability in different countries and industries. This is clear when comparing firm performance during periods of expansion and recessions.

4.2 Results

In table 4.5, I present the results from the HLM and intra-class correlation analysis. The analysis shows the respective role of firm, industry and country effects on firm profitability in six different time periods among ten different countries, namely five developed countries and five emerging countries in Latin- Amerika. Section A in table 4.5 shows the analysis with both fixed and variable effects, while the model in section B is calculated by using only variable effects. Furthermore, as mentioned earlier, the time periods are divided into six periods, specifically a small expansionary period (1999-2000), a minor recession (2001), a second expansionary period (2002-2007), a recessionary period (2008-2011), a recovery period (2012-2017) and an overall period (1999-2017). Section C and D show the inter-class correlation analysis of the emerging and developed countries separately.

Mixed effects model for all countries

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Firm effects	84,26%	89,13%	85,89%	80,79%	81,24%	79,0%
Industry effects	11,70%	7,09%	10,27%	12,78%	13,67%	14,60%
Country effects	4,04%	3,78%	3,84%	6,43%	5,09%	6,62%

Section A: Results from the mixed-effects model for all countries (hypothesis 1 and 2)

Variable effects model

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Firm effects	82,58%	95,96%	78,0%	76,85%	79,93%	74,84%
Industry effects	12,26%	2,55%	15,27%	15,34%	14,29%	17,1%
Country effects	5,16%	1,50%	7,06%	7,81%	5,78%	8,06%

Section B: Results from the variable effects model- all countries

Mixed effects model for emerging countries

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Firm effects	63,80%	83,51%	84%	95,92%	90,52%	77,35%
Industry effects	29,36%	10,11%	11,75%	2,43%	6,55%	13,84%
Country effects	6,84%	6,38%	4,39%	1,65%	2,93%	7,08%

Section C: Results from med mixed-effects models for emerging countries (hypothesis 3)

Mixed effects model -Developed Countries

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Firm effects	87,59%	95,67%	86,75%	79,84%	80,32%	76,68%
Industry effects	9,50%	2,33%	6,65%	13.83%	15,52%	16,09%
Country effects	2,91%	2,00%	6,60%	6,33%	5,73%	7,23%

Section D: Results from med mixed effects models- developed countries

Table 4.4: Intra-class correlation coefficients and variable effects model

Hypothesis 1: Firm effects influence firm profitability stronger during recessionary periods as opposed to expansionary periods.

As presented in table 4.5 section A, it is clear that firm effects on firm profitability support past studies. In the overall period (1999-2017) firm effects account for 79,0% of firm profitability. In addition, when examining all the periods, firm effects constitute the majority of firm profitability, with the strongest effects during the recessionary period in 2001 (89,13%). However, when comparing firm effects between the expansionary periods and the

recessionary periods, the model gives contradictory results. In the recessionary period of 2008-2011 firm effects accounted for 80,79% of firm profitability, as opposed to the expansionary period (2002-2007), which accounted for 85,89% of firm profitability. This leaves a difference of -5,1% between the two periods. Furthermore, the difference between the first recession (2001) and the expansionary period 2002-2007 leaves a positive difference 3,24%. This is an important finding, as it does not give support to the first hypothesis.

Since most past research has focused on variable effects models, I have for comparability purposes included a variable effects model in addition to the mixed effects model. The purpose is to compare the results from the mixed effects model to the variable effects model. As presented in table 4.5 section B, the two different models yield the same results in relation to firm, industry and country effects on firm profitability. The variable effects model indicates the same conclusion as the mixed effects model that firm effects constitute of the majority of firm profitability, followed by industry effects and country effects. The strongest firm effects can be seen in the 2001 recession, where firm effects constituted 95,96% of firm profitability, whereas in the mixed effects model firm effects constituted 89,13% of firm profitability in the same period. Further, I find that industry effects accounted for 2,55% and country effects accounted for 1,50% in the variable effects model, whereas in the mixed effects model industry effects account for 7,09% and country effects account for 3,78%. By using the mixed effects model, firm effects increase while industry and country effects decreases as opposed to the variable effects model. However, when comparing firm effects between the expansionary periods and the recessionary periods, the mixed effects model and the variable effects model yield the same results.

Hypothesis 2: Industry effects influence firm profitability less during recessionary periods as opposed to expansionary periods.

When examining industry effects across the entire period (1999-2017), industry effects account for 14,60% of the total variance in ROA. In addition, when examining industry effects on firm profitability during expansionary periods and recessionary periods, I find contradictory results. Industry effects accounted for 11,70% in the period of 1999-2000 but lost some of its explanatory power under the recession in 2001 (7,09%). This leaves a difference of -4,61%. However, in the second expansionary period in 2002-2007, industry effects rose to 10,27%, while in the recessionary period (2008-2011) it rose even higher (12,78%). This leaves a difference of 2,51%. This is contradicting, as past empirical research

has given support to industry effects is reduced under recessionary periods. Therefore, hypothesis two is not supported.

Hypothesis 3: Country effects in emerging economies have a stronger impact on firm profitability

In order to examine the behavior of country effects in emerging economies, I ran the mixed effects model for the emerging countries across all periods while excluding developed countries. The results are presented in table 4.5 section C. The results show that country effects are strong in emerging countries rising from 6,62% to 7,08% of the total variation in ROA. In addition, as visualized by the results, country effects lost some of its explanatory power under recessions, as opposed to during expansionary periods. As such, country effects dropped with -0,46% under the first recession and -2,74% under the second recession (2008-2011). In addition, under the recession period of 2008-2011, country effects diminished to 1,65%, which is quite low. Even though country effects do not have the strongest impact on the total variation in ROA, it is still of relevance. However, when running the analysis for the sample of developed countries the results show that the developed countries also experience a strong country effect. The results show that there is a difference of -0,15% of the total variation in ROA in the overall period between the developed countries and emerging countries. Furthermore, developed countries did also experience a stronger country effects during the second expansion (-2,21), recession (-2,68), and recovery period (-2,80). As such, my hypothesis is seen to be rejected.

Hypothesis 4: Firms with high interest coverage ratios experience higher return on assets
Hypothesis 5: Firms with a higher degree of operating leverage will experience higher return on assets

As for the hypothesis 4 and 5, the fixed effects coefficients are presented in table 4.6 for all periods in the sample. As for the interest coverage ratio, I find a significant interest coverage ratio coefficient in the periods of expansion and recession. The significant interest coverage ratio coefficient is 0,000109, 0,0001124 0,0000227, and 1,34E-06. These findings contradict with my assumptions that firms with a high interest coverage ratio have a higher return on assets. Therefore, I reject hypothesis four that firms with a high interest coverage ratio experience higher return on assets.

As for the degree of operating leverage, I find a statistically significant coefficient on both expansionary periods and in the first recession (2001). Therefore, I reject hypothesis 5 that firms with a higher degree of operating leverage experience higher return on assets.

Fixed effects coefficients

	Expansion (1999-2000)	Recession (2001)	Expansion (2002-2007)	Recession (2008-2011)	Recovery (2012-2017)	All years (1999-2017)
Interest coverage ratio	0,000109* (P<0.001)	0,0001124* (P<0.001)	0,0000227* (P<0.001)	1,34E-06* (P<0.001)	1,02E-08	1,59E-06
Degree of operating leverage	0,0000512* (P<0.001)	-0,00054* (P<0.001)	-0,00043* (P<0.001)	0,0000185	0,0000103	-0,0000349

(Numbers marked with a star (*) indicates statistically significant interest coverage ratio and degree of operating leverage at a 1% level)

Table 4.5: Interest coverage ratio and the degree of operating leverage for all periods in the sample

5.0 Discussion

In the discussion chapter, I discuss all five hypotheses thoroughly on the relative importance of firm, industry and country effects on firm profitability. The discussion is based on the results of the analysis as well as previous research on the subject.

5.1 Firm effects in determining firm profitability under recession and expansion

Firm effects influence firm profitability stronger during recessionary periods as opposed to expansionary periods.

The first hypothesis explores the relative importance of firm effects on firm performance. When examining the results on firm performance in a changing economic environment, my hypothesis that firm effects become stronger during recessions as opposed to expansionary periods is not supported. Nonetheless, the analyses confirm past empirical work that firm profitability is largely influenced by firm effects (Bamiatzi *et al;*2016; Short *et al,* 2007; McGahan and Porter, 2002). Yet, I find no evidence that firm-specific effects are amplified during recessions, as the second period of recession (2008-2011) shows that firm effects declined with -5,1%. This is in contrast with the findings of Bamiatzi *et al.* (2016) and Oliver (1997) who argued that firm heterogeneity becomes stronger during economic uncertainty. This indicate that under economic decline strategic factors become more incomplete (Barney,

1986). As such, I find no support to my first hypothesis, that under periods of economic distress such as recessions, strategic choices, resources and capabilities have a greater influence on firm profitability.

However, when splitting the developed countries and emerging countries, the results are conflicting. While the emerging economies show support for past empirical research that firm effects are amplified during recession as opposed to expansionary periods, firms in the developed economies show that industry effects were amplified under the second recessionary period.

5.2 Industry effects in determining firm profitability under recession and expansion

Industry effects influence firm profitability less during recessionary periods as opposed to expansionary periods.

As viewed from the results, industry specific effects do influence firm profitability. As pointed out by Bain (1951), industry structure, market concentration and intensity have an effect on firm strategic choices and their ability to generate high economic rents. As mentioned earlier, the results revealed that industry effects accounted for 14,60% of the total variance in ROA in the overall period. However, in contrast to Bamiatzi *et al.* (2016), and Majumdar and Bhattacharjee (2014), industry effects did not lose some of their explanatory power in determining firm profitability during periods of recessions as opposed to expansionary periods. As noted, during the second period of recession (2008-2011) industry effect rose to 12,78%. Even though many countries were affected by the crisis in 2008-2011, some of the countries in the sample had an advantage that other countries did not. Brazil, Australia, and Peru where able to weather the crisis better than many other countries. Brazil and Peru had very healthy fundamentals and financial systems who benefited by their closed economies and well diversified products and export markets (Roubini, 2009). Both countries did not depend on credit because their domestic credit market where at an early stage, which helped both countries on sheltering internal demand. In addition, Australia has a strong industry and natural resources, which was beneficial as their export industry were strong during the last global recession (Roubin, 2009). Since firms in Australia and Brazil are a majority in the dataset, this can be the reason for the results that industry effects are stronger during the last global recession. As seen in table 4.1, Brazil had an increase in mean ROA in the period of 2008-2011, while Australia had a negative mean ROA which decreased as opposed to the expansionary period in 2002-2007. Hence, most of the firms in the dataset

experienced a stronger industry effect than firm-specific effect. Therefore, hypothesis two is not supported.

5.3 Country effects in emerging economies

Country effects in emerging economies have a stronger impact on firm profitability

Makino *et al.* (2004b), MacGahan *et al.* (2010) and Bamiatzi *et al's.* (2016) research suggested that country effects in emerging countries have a stronger impact on firm profitability than developed countries. This is based on the assumption that emerging countries do not have a strong efficient market, as well as a strong established institutional framework. This is verified by the analysis that show country effects account for 7,08% of the total variance in ROA during the entire period (1999-2017) as opposed to 6,62% in the sample for all countries. However, the analysis show that the developed countries experienced a stronger country effects in three of the periods presented, respectively the second expansionary period, recessionary period, recovery period and the overall period. Even though country effects are relatively small as opposed to firm and industry effects, it is still of relevance. As such, I believe that the developed countries in the sample experienced a higher competition and utilized market imperfection to gain high economic rent. This will urge firms to act fast when there is a shift in demand as a result from economic decline. Thus, making strategic choices become more crucial in surviving economic distress.

In addition, it is important to take into consideration a country's changing institutional environment such as changes in the informal and unformal rules that can affect firm performance (Makino *et al.,* 2004b). Therefore, when examining country effects on firm profitability in a period of 18 years, it is important to have in mind a country's changing institutional environment such as a country's economic and political and cultural environment (Makino *et al.,* 2004b). Institutions and technological advances together can determine production and transaction cost and therefore firm profitability (North, 1990). When examining the results from the analysis, changes in the institutional environment has an effect on firm performance. This is evident in the analysis when looking at firm performance during recessions, were firm-specific strategies are stronger, diminishing country effects. This is supported by the results, where country effects are reduced during both periods of recessions as compared to the expansionary periods in both emerging and developed countries. The strongest decline in country effects in emerging economies was under the second period of recession (2008-2011) with a decline of -2,74%, as for the recession in 2001 country effect

declined with -0,46%. Which is a relatively small effect but expected, as the recession of 2001 was relatively small in contrast to the great recession (2008-2011). However, even though country effects in the developed countries were stronger, they did not experience a strong decline in country effects as opposed to the emerging countries.

Therefore, I do not find support for hypothesis three, that country effects in emerging economies have a stronger impact on firm profitability. This does not verify with previous empirical findings (Makino *et al.,* 2004; MacGahan *et al.,* 2010; Bamiatzi *et al.,* 2016) that country effects are more pronounced in emerging countries. Even though emerging economies experienced a stronger decline in country effects, developed countries have a higher variation in ROA than emerging countries. Which can suggest that both internal and external markets in emerging and developed economies were affected by economic distress. As such, firms in emerging and developed countries have to depend on the firm's own resources and capabilities in order to gain economic rents under periods of economic decline.

5.4 Interest coverage ratio

Firms with high interest coverage ratios experience higher return on assets.

Hypothesis four concerns the interest coverage ratio which is used to determine the company's ability to pay interest on its outstanding debt. Assuming that a high interest coverage ratio can suggest that the firm is experiencing a higher return on assets, it implies that the firm's profits are greater than the firm's annual interest expenses. However, this seem not to be the case for the firms examined during both expansionary periods as well as during the recessionary periods. In these four periods, I find a relatively small statistically significant coefficients for the interest coverage ratio. Which indicate that firms with a high interest coverage ratio does not experience a high return on assets. In addition, this can also suggest that a firm with a high interest coverage ratio is not in a better position to withstand an economic decline such as a recession.

Nonetheless, as visualized by the analysis the statistically significant interest coverage ratio coefficient for all four periods is 0,000109 (1999-2000), 0,0001124 (2001), 0,0000227 (2002-2007) and 1,34E-06 (2008-2011). This theoretical value indicates that firms with a high interest coverage ratio does not yield a higher return on assets as compared to firms with a low interest coverage ratio during periods of expansion and recession. However, these interest coverage ratios coefficient are very small, close to zero, which indicate that the effect of the

interest coverage ratio on firms return on assets is very low. In addition, it is important to emphasize that since the analysis include 4470 firm across ten countries one must be aware of the p-value problem. Since the dataset consist of a large sample of firms, the p-values are close to zero, which means that irrelevant effects may become statistically significant (Lin *et al*., 2013). Hence, not reflecting practical significant of the coefficients, which means that the coefficients might not reflect the true practical value of the interest coverage ratio coefficients. It is unlikely that in all four periods, which also consist of 4470 firms, will together yield coefficients so close to zero. Which means that if the interest coverage ratio increases with 1% mean ROA will almost not be affected, since the coefficients are so close to zero.

5.5 Degree of operating leverage

Firms with a higher degree of operating leverage will experience higher return on assets.

The fifth hypothesis concerns the degree of operating leverage which evaluate how a firm's operating income changes with respect to a percentage change in its sales. The analysis shows three statistically significant degree of operating leverage coefficients in three of the periods presented, respectively 0,0000512 (1999-2000), -0,00054 (2001), and -0,00043 (2002-2007). As noted, the degree of operating leverage coefficients in the period of 1999-2000 is positive, which suggest that firms in this period who experienced a high degree of operating leverage did not gain a higher return on assets. However, firms in the period of 2001 and 2002-2007 have a negative degree of operating leverage coefficients. Yet again, these degree of operating leverage coefficients are relatively small, close to zero. This suggest that the effects of the degree of operating leverage on firms ROA is relatively low. Since I have used the degree of operating leverage to represents the firms actual operating leverage it can be the reason for the mixed results, as the last two periods are not significant. The reason for using the degree of operating leverage as representative for the firms operating leverage is because it was not possible to retrieve such detailed information about the firms' fixed and variable cost from Thomson Reuters database. In addition, as mentioned earlier, one must be aware of the p-value problem. As noted, the statistical coefficients of the degree of operating leverage are close to zero, which indicate that the effect of the degree of operating leverage on firms return on assets is very low.

5.6 Limitations

Since past research have relied on return on assets (ROA), I have chosen to employ the same accounting measure as a measurement of performance. As previously mentioned, return on assets as a performance measure was selected in order to compare the results to the analysis to previous studies. Unfortunately, return on assets as a measurement of performance has its disadvantages. One of the weaknesses is that return on assets does not measure cash flows and returns are not adjusted for risk (Hawawini *et al,* 2003). In addition, it does not take into consideration different accounting policies and conventions in different countries, thus making the true value of the performance measurements distorted (Hawawini *et al,* 2003). However, one might obtain a more representative findings by applying other measurements that takes into consideration the weaknesses of the accounting measurements. One of the advantages of using return on assets as performance measurement is that it is a widely used accounting performance measurement, and it allows for comparison of firms with different currencies. Because most of the previous research have used return on assets, I find it appropriate to apply the same performance measurement for the analysis in this thesis.

Another limitation in this thesis is that I have set a limit at +/- 60% ROA for the firms in the sample. Therefore, the dataset is subject for selection bias since the restriction leaves out firms that otherwise may have affected the results from the analysis. However, the restriction leaves out extreme abnormal high/low returns which might have affected the statistical significance of the analysis. These abnormal high/low returns may cause exaggerations in the results because of the selection bias. Yet, I find it necessary to set this restriction in order to reflect the average firm, as some of the firms in the sample did have abnormal returns.

Since firms in the developed countries are dominating in the sample, it can be the reason for why the mixed effects models show varying results under the recession 2008-2011. As noted in section A and section D in table 4.5, the mixed effects model for all countries and developed countries show that firm effects decreased, and industry effects increased in 2008-2011. As for the emerging countries, the results show that under the second recession firm effects increased, whereas industry effects decreased. Hence, firms in emerging countries do not have a big effect in the sample with all countries as firms in Latin-Amerika are a minority. Therefore, it may seem that the developed countries could be affecting the results in the sample with all countries.

5.7 Implication and suggestion for future research

This analysis support past empirical research as I have found evidence that firm, industry and country effects influence firm profitability. The first implication is firm effects, which prevail during all six periods presented, the expansionary periods, recessionary periods, recovery period and the overall period. Under macroeconomic shocks such as recessions, institutional environments are affected, and the "rules of the game" change. The relative importance of firm effects in determining firm profitability under economic shocks seems to be important during recessions. Even though firm effects did not get amplified during both recessionary periods it is still of importance as firm effects constitute of the majority of firm profitability. Nevertheless, industry effects did not lose some of its explanatory power under the great recession 2008-2011, which suggest that a strong industry can become equally important as firm attributes. Therefore, managers should not disregard the importance of the industry-based view. Managers should not only focus on firm-specific attributes but also the firm's industry, as the industry's role is relatively important. As such, I believe that that firm specific-attributes and firm's industry are complementary, combining in such a way that they can emphasize firm performance and thereby firm profitability.

A second implication concerns country effects on firm profitability in emerging countries. There is evidence in the analysis that country effects in emerging economies are strong, which is attributed to the existing structure of the internal market, which is developed to divert institutional inefficiencies (Chakrabarti *et al.,* 2011; Peng *et al.,* 2008). However, the developed countries did experience a stronger country effects as compared to the emerging countries. Therefore, managers need to look beyond the resource-based view and industrial organization economics which ignores country effects. Country effects can indeed have a positive effect on firm profitability because of country advantages, which can be associated with resources and attributes (Bamiatzi *et al.,* 2016). As such, managers need to be aware of country effects when developing strategies.

The analysis revealed that there is a significant impact of firm effects across all periods and implies that firm effects is of great importance. As noted, industrial organization economics is of importance, and should not be ignored. Yet again, under the second period of recession (2008-2011) firm effects constituted of 80,79% of the total variance in mean ROA, a decrease of -5,1%, while industry effects increased with 2,51%. Future research should explore this contradicting result when comparing the result to the 2001 period. In addition, future researchers might also explore a longer time period in order to analyze firm performance

under varying macroeconomic turbulence. Furthermore, one should consider applying other performance measurements such as utilizing enterprise value ratios, growth, NOPAT, and sales performance.

Future research should also examine firm effects in state owned companies as well as privately owned companies. For instance, managers in privately owned companies may have more freedom to make decisions without consulting others in respects to strategic choices. Hence, these managers can react faster to macroeconomic changes that can have an effect on the firm or its industry. Furthermore, it would be interesting to research state-owned enterprises under macroeconomic shocks to get a further insight on how this type of ownership provide growth, and how its institutional environment and management reacts to economic adversity.

As for country effects, the analysis suggest that country effects have an influence on firm profitability. Future researchers might examine if there is a difference in small economies as opposed to large economies. It could be of interest to investigate how a country's economy size might affect firm profitability under macroeconomic turbulence.

This thesis has incorporated institutional theory in order to get at further understanding on how a firm's social system influence industry structure and firm performance. For researchers with a strong interest in institutional theory, should investigate how macroeconomic shocks have an impact on different institutional environments and how firms react to these changes. Changes in the institutional environment have an impact on how resources are deployed. Organizations and its culture influence how managers manage and encourage learning and deploy different strategic assets under macroeconomic turbulence. Changes in the institutional environment affect managers and their strategic choices, thereby affecting firm performance.

This thesis implies that under macroeconomic shocks, managers should focus on the firm's own resources and capabilities, while incorporating industrial organization economics. However, the importance of a changing institutional environment should also be taken into consideration, as economic rent is highly important when managers are making their decisions.

6.0 Conclusion

The purpose with this thesis is to examine the relative importance of firm, industry and country effects on firm profitability. The subject has been discussed for over decades in the field of strategic management and is therefore still of relevance, as it is still unclear. This thesis seeks to examine how macroeconomic adversity such as recessions affect firm profitability by looking at how firm, industry and country-specific factors determines firm profitability.

The primary focus of this thesis, is driven by the research question: *To what degree do firm, industry, and country effects influence firm profitability?* In order to answer the research question, I developed five hypothesis covering firm, industry and country effects. The study also incorporates the interest coverage ratio and degree of operating leverage in order to investigate if they have an impact on return on assets. In addition, the datasett is based on five Latin-American countries as well as five developed countries in the period of 1999-2017.

The results of the analysis indicate that there is evidence that firm effects are more pronounce than industry and country effects. However, industry effects did not lose some of its explanatory power under macroeconomic turbulence such as the recession in 2008-2011 as suggested by Bamiatzi et al. (2016). Nevertheless, as industry effects did not lose some of its explanatory power, it becomes clear that how a firm position itself in its industry is of great importance. However, in 2001 industry effects declined as opposed to firm effects, which suggest that firm's attributes are equally important as industry structure. This can suggest that one school of though is not enough to gain long lasting sustained competitive advantage. One can suggest that industrial organization economic and the resource-based view are complementary, where both combined can enhance high economic rent and a long lasting sustained competitive advantage. The characteristic of the industry such as industry structure, intensity of competition and market concentration, can affect firm strategic choices and its ability to generate high economic rent. The analysis did also reveal that country effects are not stronger in emerging countries. Despite a globalized world, country effects are strong in both emerging and developed countries, indicating that country effects have an impact om firm performance and are of importance across all countries.

As for the fixed variables, the interest coverage ratio and degree of operating leverage, I find a relatively small statistically significant coefficients for the interest coverage ratio in four periods. This indicate that firms with a high interest coverage ratio does not experience a high

return on assets. I assume that firms with a high interest coverage ratio is not in a better position to withstand a macroeconomic decline. As for the degree of operating leverage, I find a small statistically significant degree of operating leverage coefficients in three of the periods. Indicating that firms with a high degree of operating leverage do not experience a high return on assets in these periods. However, I question the practical significant of these results and encourage future research to investigate further.

The results of the analysis are of great interest for managers and for others with a strong interest in strategic management. The analysis show that a firm's own fate is self-determined as suggested by Short et al. (2007), thereby implying that firm's attributes are of great importance. However, the analysis also imply that industry structure should not be ignored, and that firm specific-attributes and industry are complementary, combining in such a way that they can emphasize firm performance and thereby firm profitability. As such, managers should not only focus on one school of thought under periods of macroeconomic adversity but focus om firm specific attributes and industry structure. In this way, managers can overperform the market and survive, while not facing insolvent. Furthermore, managers should also incorporate the impact of country specific norms even though they are not the strongest.

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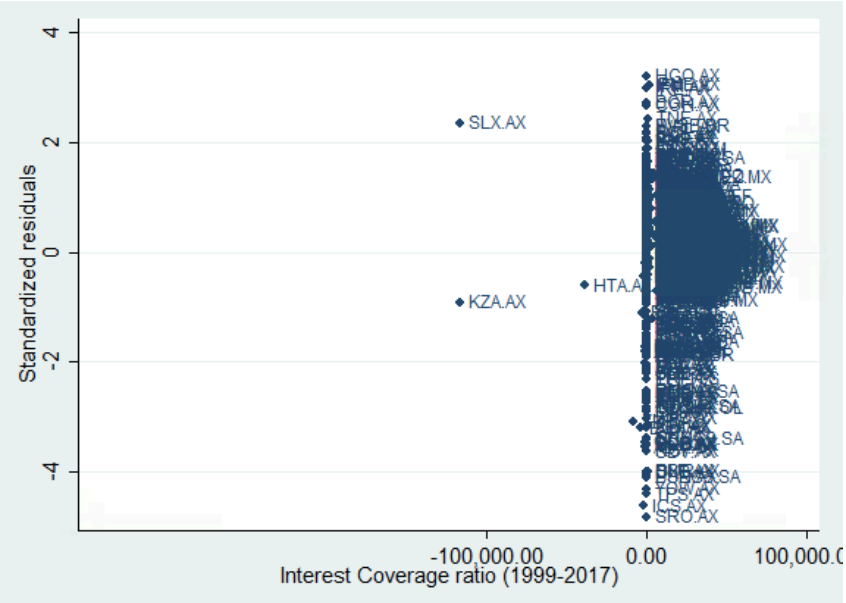
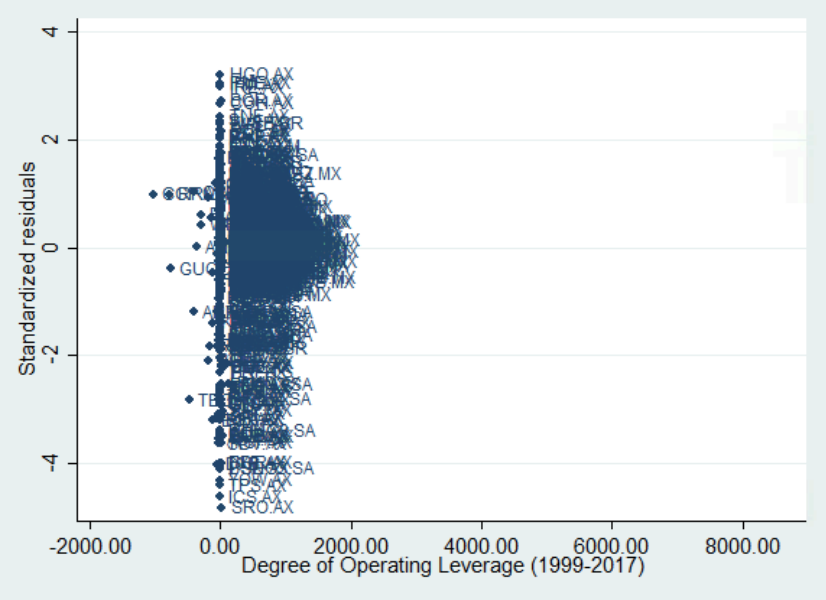
Appendix

Appendix 1- Outliers

a) <u>All countries 1999-2017</u>



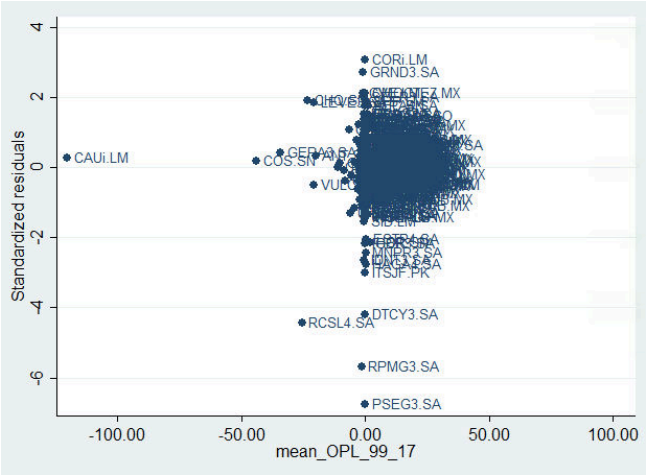


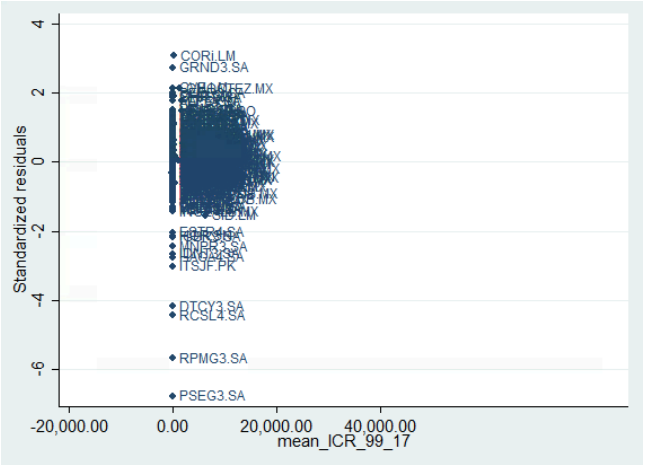
	Identi~r	rstd_9~l
2457.	HGO.AX	3.201139
2462.	IFM.AX	3.018753
2498.	PME.AX	3.049219

list mean_roa_99_17 mean_ICR_99_17 mean_OPL_99_17 Identifier Country d if d>4/3676

191.	-1.1365851	-105.88	-1315.13	SIH.AX	Australia	47.36496
193.	-.27714289	-251.77	443.57	IDA.AX	Australia	.1150599
3677.	.05708224	5.90	.	AHY.AX	Australia	.
3678.	-.83214414	-675.21	-1169.28	CBDEF.PK	Australia	13.99613

b) Emerging Countries (1999-2017)





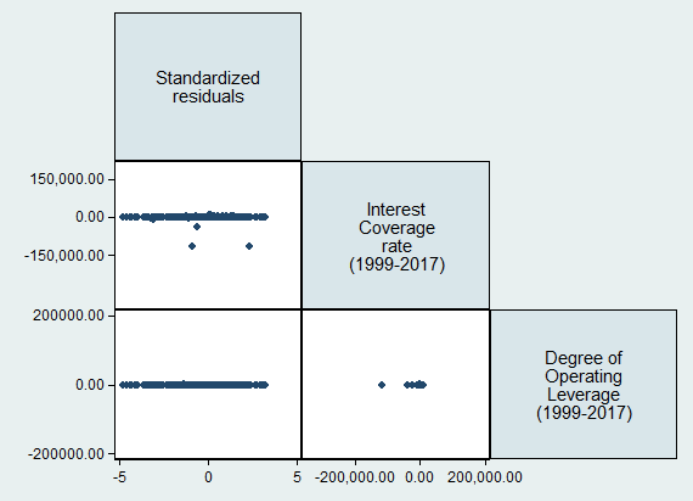
	Identi~r	rstd1_~l
731.	CORi.LM	3.680247

Coefficients for the interest coverage ratio and degree of operating leverage with and without outliers:

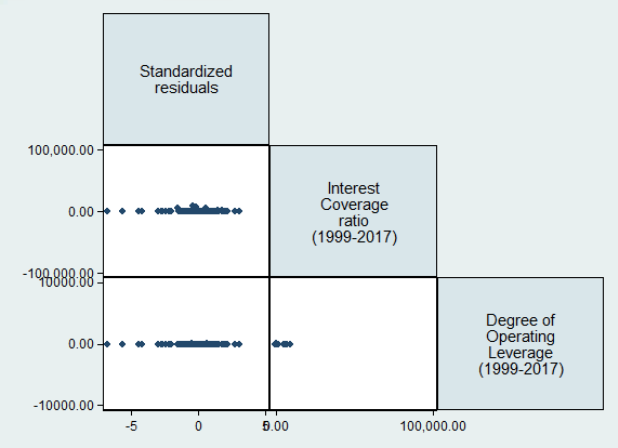
	Recession (2001)			Recession (2008-2011)		
	With outliers	**Without outliers**	**Difference**	**With outliers**	**Without outliers**	**Difference**
Interest coverage ratio	0,0046847	0,01109	-0,0072	0,00007	0,0000616	0,0000084
Degree of operating leverage	-0,001578	-0,001603	0,000025	-0,000135	-0,000132	-0,000003

Appendix 2- Linearity

a) All countries (1999-2017)

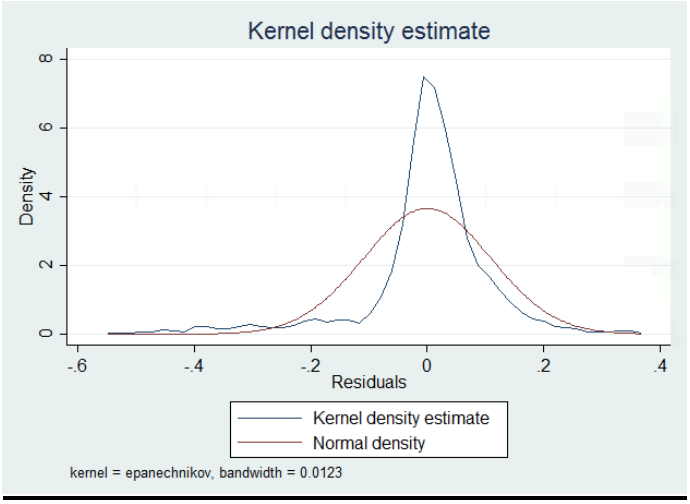


b) Emerging countries (1999-2017)



Appendix 3- Normal distribution

a) All countries (1999-2017)



Shapiro-Wilk W test for normal data

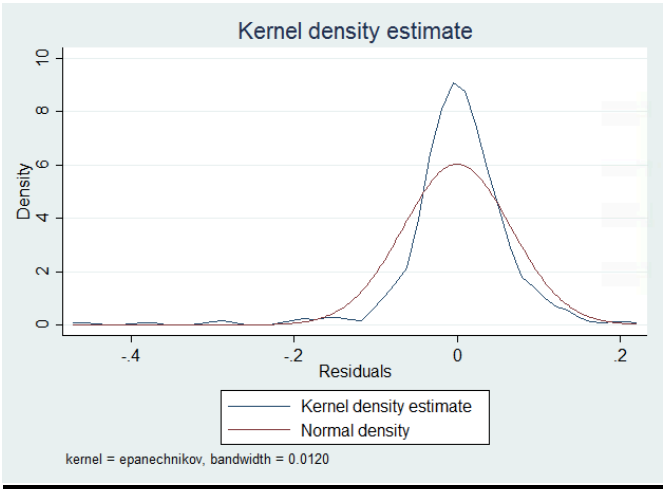
Variable	Obs	W	V	z	Prob>z
residuals~17	1,086	0.26646	498.749	15.435	0.00000

Note: The normal approximation to the sampling distribution of W' is valid for 4<=n<=2000.

```
. tabstat residuals_99_17 if mean_roa_99_17 <= 0.6 & mean_roa_99_17>= -0.6, stat (mean sd skew kurt)
```

variable	mean	sd	skewness	kurtosis
residuals~17	3.18e-11	.1090514	-1.424435	7.876327

b) Emerging countries (1999-2017)



Shapiro-Wilk W test for normal data

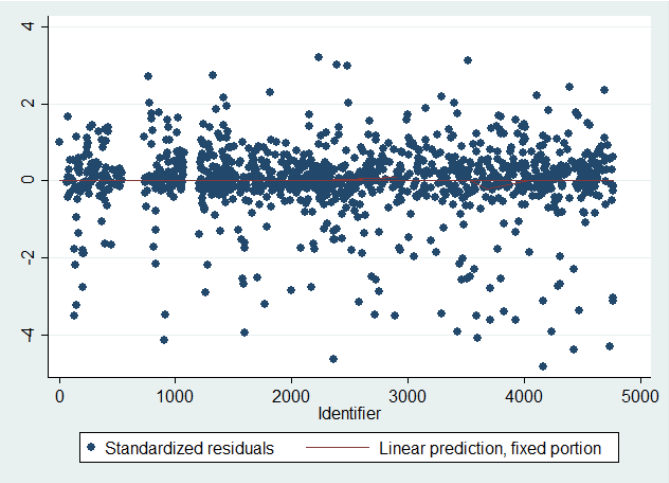
Variable	Obs	W	V	z	Prob>z
residuals~17	343	0.84794	36.492	8.498	0.00000

variable	mean	sd	skewness	kurtosis
residuals~17	1.16e-10	.0661398	-1.988033	14.56954

Appendix 4- Heteroscedasticity

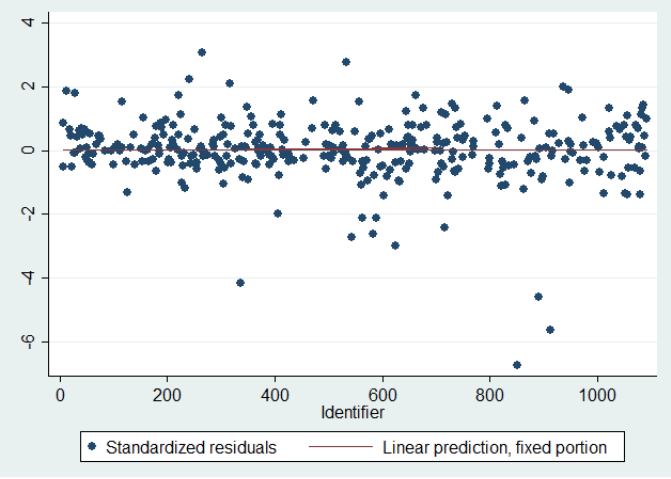
a) All countries (1999-2017)

```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(5)      =      9.95
         Prob > chi2  =    0.0765
```



b) Emerging countries (1999-2017)

```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(5)      =      4.20
         Prob > chi2  =    0.5203
```



Appendix 5- Multicollinearity

a) **All countries (1999-2017)**

Variable	VIF	1/VIF
Interest Coverage ratio (1999-2017)	1.00	0.999982
Degree of Operating Leverage (1999-2017)	1.00	0.999982
Mean VIF	1.00	

Correlation (1999-2017)

	Mean ROA (1999-2017)	Interest coverage ratio (1999-2017)	Degree of operating leverage (1999-2017)
Mean ROA (1999-2017)	1,0		
Interest coverage ratio (1999-2017)	0,0413	1,0	
Degree of operating leverage (1999-2017)	0,0774	0,0052	1,0

b) **Emerging countries (1999-2017)**

Variable	VIF	1/VIF
Interest Coverage ratio (1999-2017)	1.00	0.999769
Degree of Operating Leverage (1999-2017)	1.00	0.999769
Mean VIF	1.00	

Bivariate Correlation (1999-2017)

	Mean ROA (1999-2017)	Interest coverage ratio (1999-2017)	Degree of operating leverage (1999-2017)
Mean ROA (1999-2017)	1,0		
Interest coverage ratio (1999-2017)	0,0690	1,0	
Degree of operating leverage (1999-2017)	0,1042	0,0152	1,0

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