Firm, industry and country effects on firm profitability: A multilevel approach

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Abstract

The objective of this master thesis is first and foremost to examine to what degree firm, industry and country effects influence firm profitability. As such, this thesis revisits an ongoing discussion within strategic management regarding the main sources of firm profitability variances. Simultaneously, we bring in new elements and thus extend previous research. First, we apply a different measure of firm profitability, namely return on invested capital (ROIC), which to our knowledge has not previously been applied in such a study. Second, we integrate elements from corporate finance and examine whether degree of operating leverage and unlevered beta influences firm profitability. Finally, we elaborate on Bamiatzi, Bozos, Cavusgil and Hult's (2016) study, and examine the relative role of firm, industry and country effects on firm profitability during changing economic environments.

The data in this study is based on ROIC from publicly traded firms in the G-10 countries during a twelve-year time span (2005-2016). In our analysis we employ a mixed effects model in a hierarchical linear multilevel model (HLM) and use an intra-class correlation coefficient (ICC) to establish the relative role of firm, industry and country effects on firm profitability.

Our results for the overall period (2005-2016) indicate that firm, industry and country effects accounts for respectively 88,93%, 9,48% and 1,60% of the variance in firm profitability, and hence, these effects are all of relevance in determining firm performance. When examining these effects during a changing economic environment, firm effects become stronger during a recession, whereas industry and country effects lose some of their explanatory power. As for degree of operating leverage we find no significant results. Unlevered beta on the other hand, has a significant small negative coefficient during the recovery period (2012-2016), indicating an inverse relationship to the overall market. In addition, our research establishes that by incorporating degree of operating leverage and unlevered beta to our model, firm effects gain importance, while country and especially industry effects lose some of their explanatory power in determining firm profitability.

As such, our findings indicate that firm effects account for the majority of the variance in firm profitability, and thus, firms are to a great length responsible for their own success. This implication is particularly prominent during periods of economic downturns.

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Preface

This thesis concludes our master's in business administration with a specialization in cost management at the Norwegian University of Life Sciences. The hours of work put into this thesis has been challenging at times, while at the same time also very rewarding and intriguing. The thesis was written from January to May 2018.

Ås, May 2018

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1.0 Introduction

For more than seventy years there has been an ongoing discussion in the field of strategic management regarding the main source of firm profitability (Roquebert, Phillips, & Westfall, 1996). Within strategic management, the relative importance of firm, industry and country effects in determining firm profitability have been highly relevant. In this manner, firm effects refer to distinct firm attributes and capabilities. Furthermore, industry effects cover features which are common to an industry, while country effects refer to factors unique to a country.

Therefore, how a firm position itself in relation to other firms, its industry, institutional environment and geographical location will be of great relevance when businesses develop their strategy. However, there are many different views within strategic management regarding how to achieve firm profitability. A specific branch within strategic management that focuses on the importance of firm effects is the resource-based view. This view implies that firm-specific effects, such as distinctive attributes, is what drives differences in firm profitability. A firm's distinctive attributes hence holds the potential to serve as a source of sustained competitive advantage (Barney, 1991). Industrial organization economics disputes the above resource-based view. Instead the industrial organization economics emphasizes the importance of industry structure as a key determinant factor for firm profitability (Porter, 1980a). Finally, as countries differ on a variety of attributes, some argue that country effects are relevant for firm behaviour and performance (Makino, Isobe, & Chan, 2004b; Goldszmidt, Brito, & Vasconcelos, 2011).

While the theories above provides different explanations for the main source of profitability variances, previous empirical research find evidence for both firm, industry and country effects on profitability (Schmalensee, 1985; Rumelt, 1991; McGahan & Porter, 1997; Hawawini, Subramanian, & Verdin, 2004; Bamiatzi et al., 2016). However, researchers disagree on the relative importance of each effect. As such, the primary motivation and focus for 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, we have created six hypotheses, which will be examined through a quantitative analysis. The first hypothesis delves into the traditional discussion focusing on firm effects versus industry effects. This is followed by the second and third hypothesis concerning unlevered beta and degree of operating leverage's influence on firm

profitability. Hypothesis four and five examine the relative importance of firm and industry effects during a shifting economic environment, whereas the last hypothesis covers the importance of country effects on firm performance. These hypotheses are embedded in the resource-based view, industrial organization economics, institutional theory and corporate finance, alongside previous empirical research. A more thorough presentation of the hypotheses will be given in chapter 2.

To differentiate our study from previous research, we have chosen to examine a different sample of economies, respectively the G-10 countries, during a time of expansion (2005-2007), recession (2008-2011), recovery (2012-2016), as well as an overall period (2005-2016). By separating the periods based on their economic characteristics, we expect to gain knowledge of how these distinct periods affects the relative importance of firm, industry and country effects in determining firm profitability. To this date there exist limited research emphasizing the relative importance of these effects during changing economic conditions. To our knowledge, Bamiatzi et al. (2016) is the only study incorporating such economic cycles when estimating the variance components of performance. As such, we model our work after Bamiatzi et al. (2016).

To further differentiate our study, we have used return on invested capital (ROIC) as our profitability measure, as opposed to return on assets (ROA), which have been applied in most former studies. Furthermore, we will test our results against specific variables, respectively degree of operating leverage and unlevered beta, which we expect will provide additional explanations to some of the variance in firm performance. Hence, this thesis extends previous research within the field of strategic management by bringing in elements from corporate finance. As such, this thesis should be a useful contribution to the debate regarding the relative importance of firm, industry and country effects on firm profitability.

The following of this thesis contains an explanatory theoretical background and a presentation of previous empirical findings, at which we base our hypothesis development. This is followed by a chapter where our dataset and methodology are thoroughly described, before we present our empirical results and discuss our findings. We will end our thesis by presenting our conclusion.

2.0 Theory

The field of strategic management is primarily concerned with the management of organizations and firms by evaluating what causes their success or failure (Rumelt, Schendel & Teece, 1991). This evaluation relies among others on a firm's decisions in regard to its competitive position, strategic choices, and institutional context (Oliver, 1997). As such, strategic management involves developing, implementing, and assessing cross-function choices that allow organizations and firms to reach their objectives (David, 2011).

A core concept within strategic management is economic rent: *"excess return to resources that are in limited supply"* (Schoemaker, 1990, p. 1179). How firms acquire economic rent, and attain a sustained competitive advantage are paramount within strategic management. However, schools of thought within the field disagree on how to achieve economic rent and as such, the theoretical pillars in strategic management have taken different courses over time.

Early research within industrial organization economics dates back to the 1930's and includes the work of Edward Mason. According to Mason (1939), there is a strong link between market structure and firm profitability. This line of research was further developed by Joe S. Bain in the 1950's and gave rise to the structure-conduct-performance (SCP) paradigm (McKinsey, 2008). By the 1970's, industrial organization economics became the main theoretical pillar within strategic management when assessing firm performance (Rumelt et al., 1991). The principal argument was that the industry characteristics were key factors in determining firm performance (Porter, 1980a).

However, during the 1980's, a new branch within strategic management surfaced as some researchers began to focus on the firm itself as a unit of analysis to explain performance differences, rather than the industrial environment. This shift was a result of industrial organization economics failure to sufficiently give a thorough explanation of differences in firm performance within the same industry (Roquebert et al., 1996). Researches now raised the question as to why firms within the same industry, who faced identical market conditions, still varied in their performance? In order to answer the question regarding intra-industry heterogeneity[1], a new concept prospered, namely the resource-based view. This view focused on the connection between a firm's distinctive attributes and its performance (Barney, 1991).

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[1] Intra-industry heterogeneity refers to heterogeneity within one industry.

The resource-based view further builds on the assumptions of resource heterogeneity and immobility, and thus assumes that firms can be heterogeneous in terms of the resources they control. Hence, firms should have the potential to attain a sustained competitive advantage through resources and capabilities that are valuable, rare, inimitable and non-substitutable (Barney, 1991).

Despite the resource-based view and industrial organization economics valuable contribution to the field of strategic management, they have both received criticism for their failure to sufficiently recognize the importance of the institutional environment. As such, we have incorporated institutional theory. This theory focus on how organizations and firms operate within a particular social system, and thus highlights how the institutional context influence the industry structure and firm performance (Bamiatzi et al., 2016). Hence, from the perspective of institutional theory it becomes clear that the institutional context also influences firm profitability (Oliver, 1997).

From the above it becomes clear that the resource-based view, industrial organization economics and institutional theory can all be directly linked to firm and industry effects on firm profitability. However, as for country effects, a single theory has usually not proven to be sufficient in capturing how distinct factors to a country can affect a firm's strategy, and hence its profitability (Hawawini et al., 2004). As a result, the theoretical background for country effects are based on a cross function of international business, international management, international economics and finance.

The following subchapters will give a more thorough explanation of the resource-based view, industrial organization economics, institutional theory, as well the theoretical basis for country effects. Along with the theoretical fundament we will present findings from previous empirical research regarding the relative role of firm, industry and country effects on firm performance. Our hypotheses are based on both theory and previous empirical research and will be introduced throughout chapter 2.

2.1 Review of the resource-based view

The resource-based view was initially introduced by Wernerfelt (1984) and emphasises the link between a firm's distinctive attributes and its performance. The view argues that a firm's resources and capabilities are the main sources of sustained competitive advantage (Barney, 1991). This implies that differences in firm profitability are more prominent between firms than between industries (Makino et al., 2004b). The resource-based view further builds on the assumptions of resource heterogeneity and immobility and considers this to be imperative in order to gain a sustained competitive advantage. Heterogeneity in turn derives from managerial decisions to set forth valuable, rare, imperfectly immobile and non-substitutional resources (Barney, 1991). These internal managerial decisions are often led by economic rationality, efficiency, effectiveness and external strategic industry factors (Conner, 1991; Oliver, 1997).

As the terms *firm resources* and *sustained competitive advantage* are essential to this theory, these will be defined to avoid any potential confusion. In this thesis, firm resources will be defined as *"all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable a firm to conceive of and implement strategies that improve efficiency and effectiveness"* (Barney, 1991, p. 101). These resources may in turn be a source of sustained competitive advantage. A company have a sustained competitive advantage when: *"it 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 benefits of this strategy"* (Barney, 1991, p. 102). However, a sustained competitive advantage does not indicate that it is everlasting (Barney, 1991). It simply means that regardless of replication efforts from competitors, the advantage will not cease to exist. Nonetheless, unanticipated changes, such as an economic shock, might make a resource that once was a source of sustained competitive advantage lose its value.

In addition, it is important to note that not all firm attributes are of strategic relevance (Barney, 1991). Some may prevent a firm from achieving and implementing strategies, while others may have no impact at all. Barney (1991) argued that for a resource to be a source of sustained competitive advantage, it must have four attributes. It must be valuable, rare, imperfectly immobile and non-substitutional. Together, these attributes make up the VRIN framework.

- *Valuable:* A resource is said to be valuable if it improves a firm's efficiency and effectiveness. Traditionally, this has been done by utilizing opportunities while at the same time neutralizing threats in the firm's environment.

- *Rare:* A resource also needs to be rare amid a firm's current and potential competitors. If this isn't the case, then other firms will be able to conceive of and maintain the same strategy, and thus there is no sustained competitive advantage.

- *Imperfectly immobile:* A resource can be classified as imperfectly immobile because of one, or a combination of three reasons. The first one being unique historical conditions, which entails that a firm's capability to obtain and take advantage of some resources depends on their individual history. Another source for a resource to become imperfectly immobile is when the causal ambiguous link between a resource and sustained competitive advantage is not understood or poorly understood by competing firms and the firm itself (Barney, 1991). The last contributor to imperfect immobility is that a resource is socially complex. Examples of resources with social complexity includes a firm's culture (Barney, 1986) or a firm's reputation among suppliers (Porter, 1980a).

- *Non-substitutability:* The last attribute in the VRIN framework is non-substitutability. This implies that a resource cannot have strategically similar resources that are valuable, rare or perfectly immobile.

Together, these four attributes give an indication of to what degree a resource is heterogeneous and immobile, and hence whether it is a source of sustained competitive advantage or not.

Despite the resource-based views useful insights, the theory has been subject to some criticism. One of these criticisms concerns VRIN and argue that this framework is not always necessary or adequate in order to gain a sustained competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). This means that a resource can be a source of sustained competitive advantage without meeting the criteria of the VRIN framework. At the same time, a resource can hold all the attributes of the VRIN framework and yet not be a source of sustained competitive advantage. Another criticism involves the definition of resources, which argue that the definition is unworkable, indicating that it is excessively inclusive. In addition, arguments have been made that the value of a resource is indefinite, and as such, too vague to yield a theory (Kraaijenbrink et al., 2010). This indicates that the resource-based view needs a clearer definition of value. Yet, despite its criticism, the resource-based view is considered to be among the most influential theories within strategic management (Kraaijenbrink et al., 2010).

In sum, according to the resource-based view, it is the firm itself that is the main source of profitability differences among firms. From this perspective, it is the rational managerial

decisions, the accumulation and utilization of resources, strategic industry factors as well as factor market imperfections that leads to sustainable competitive advantage (Oliver, 1997).

2.2 Review of industrial organization economics

Industrial organization economics is primarily concerned with the market structure, and how a market structure is functioning (Tirole, 1988). In this thesis, industrial organization economics is applied as one of our main theoretical pillars as it examines to what extent the market structure has an impact on firm's strategy and decision making, which in turn affects a firm's profitability. Industrial organization economics argue that due to different market structures, the strategic behaviour, as well as the interaction between firms, differ between industries. This is based on the assumption that market structure is a key determinant of firm profitability, and thus variation in firm performance is larger between industries, as opposed to within industries (Makino et al., 2004b). Within the field of industrial organizations economics, firms who operate in an industry are considered to be similar in terms of strategically important resources with the exception of scale (Rumelt et al., 1991). Based on this assumption, industrial organization economics considers industry as the main unit of analysis when assessing performance differences among firms.

The structure-conduct-performance (SCP) paradigm, presented by Bain in the 1950's, is a well-known concept within industrial organization theory which is based upon neoclassical theory of the firm (Hawawini, Subramanian, & Verdin, 2003). The SCP-paradigm is used to connect the market structure with market conduct and performance. Bain defined market structure as: *"(...) those organizational characteristics of a market or industry that determine the character of seller-to-seller, seller-to-buyer, and similar relationships and thus influence the nature of competition in the market (...)"* (Bain, 1968, p. 300). Following the SCP paradigm, *structure* applies to the environment in which firms in a particular market operate. *Conduct* refers to the behaviour and actions of the firms in a market, including the decisions firms make, and how these are taken. Finally, *performance* concerns profitability and economic welfare. The SCP paradigm is based on the thought that structural characteristics and compositions of industries/markets within an economy, constrain the conduct (or strategies) of firms. These constraints will in turn cause performance differences between firms in relation to the industry in which it operates (Mason, 1939).

As such, industrial organization economics consider firms to be integrated components of an industry, and thus, firm performance is connected to the industry structure. The structure of an industry is surely exogenous but gets affected by multiple internal competitive forces (Bamiatzi et al., 2016), such as the quantity and size of competitors, competitive rivalry among firms, the extent of product differentiation, entry and exit barriers, and market information availability (Bain, 1950, 1951, 1954; Mason, 1939). As such, firm performance can be said to in turn influence market structure, creating a circle effect.

The framework "Porter's five forces" introduced by Michael E. Porter in the 1980's, can be said to further supplement the conduct part of the SCP paradigm. The five forces framework is used to analyse specific attributes of the industry structure which affect competition, and hence, firm's competitive strategies. The framework consists of five forces, respectively threat of new entrants, bargaining power of buyers, rivalry between existing competitors, threats of substitute products and bargaining power of suppliers (Porter, 1980a). Porter and Millar (1985) posits that industry structure is incorporated by these five forces, which jointly determine industry profitability. Firm's should seek to find a position in its industry where these competitive forces are beneficial, or cause the least harm (Porter, 1980a). This is because the respective impact of the competitive forces to a great length determine the potential for a firm to generate sustainable economic rent (Spanos & Lioukas, 2001). Through knowledge of the underlying sources of competition within the industry, firms may obtain crucial information regarding the attractiveness of the industry, reveal strengths and weaknesses of the company, identify where strategic changes are advantageous, and bring to light industry trends that emerge as either opportunities or threats (Porter, 1980a).

As such, according to industrial organization economics, the characteristics of the industry structure determine the profit potential. As such, intra-industry differences in firm profitability are subject to firm's positioning in relation to their counterparts in the industry (Porter, 1980a).

2.3 Comparison of resource-based view and industrial organization economics
It becomes clear that industrial organizations economics and the resource-based view hold contrasting views regarding the main source of firm profitability. Industrial organization economics suggests that industry structure is the main driver of firm profitability. As such, the performance differences between firms within the same industry are subject to their positioning in relation to their counterparts (Porter, 1980a). The resource-based view has an alternate

explanation for firm profitability: it suggests that the firm itself is the main source of sustained competitive advantage, building on the assumption of resource heterogeneity and immobility. This contradicts with industrial organization economics, which argues that firms within an industry control similar strategically relevant resources, with the exception of scale, and therefore the industry structure is the main source of firm performance. The resource-based view however, claims that if this is the case, then no firm will gain a sustained competitive advantage. If all firms possess the same resources, they will all be able to pursue and implement the same strategies. As a result, firms will improve their efficiency and effectiveness in the same manner and to the same degree, and thus, no sustained competitive advantage will be gained (Barney, 1991).

While these two theories take different stances in regard to the main driver of firm profitability, some researchers argue that these views are complementary to each other, rather than competing (Mahoney & Pandian, 1992; Kraaijenbrink et al., 2010). While industrial organization economics focus on industry structure as a determinant for firm profitability, thus emphasising external forces for the firm, the resource-based view focus on internal attributes as sources of sustained competitive advantage. Hence, it is argued that the resource-based view should not be used as a replacement for industrial organization economics, but rather serve as a complement to it (Mahoney & Pandian, 1992; Kraaijenbrink et al., 2010). By doing so, one could be able to identify both external and internal factors which are of relevance to the firm.

Even though the influence of firm and industry effects on firm performance early on gained much theoretical attention, little empirical research addressed the relative importance of each effect before Schmalensee in 1985 (Rumelt, 1991). Schmalensee's innovative article introduced a new approach to evaluate the variance components of profitability, and thus the relative importance of firm and industry effects on firm profitability. The findings from his paper suggested that, in line with industrial organization economics, industry effects did indeed exist and were substantial. However, even though industry effects were important, it was not all that mattered. At the same time Schmalensee (1985) found no evidence of firm effects. An important note to these findings is that about 80% of the variance in profitability remained unexplained. Moreover, the study was conducted on data from American manufacturing firms during only one year.

Rumelt tried in his 1991 article to correct for Schmalensee's weaknesses by using the same line of data[2], but looking at four years (1974-1977) versus one (1975). Rumelt's research distinguished itself from Schmalensee's as it examined a longer time period and could therefore incorporate stable and fluctuating effects. Rumelt also divided his samples into two, A and B. Sample A consisted of the same data as Schmalensee, while sample B included some additional firms to sample A. Both of these samples showed evidence of small stable industry effects. However, unlike Schmalensee, the result also showed large stable firm effects. This finding indicated that, in line with the resource-based view, it is in fact the firm itself that is the main driver for economic rent. Rumelt's research hence suggested that using industry as a unit of analysis is wrong, because firms within an industry are much more heterogeneous than previously thought (Rumelt, 1991).

Table 2.0: Findings from previous empirical studies

Prior studies: performance measure ROA						
	Schmalensee (1985)	Rumelt* (1991) sample A	Rumelt* (1991) sample B	McGahan & Porter (1997)	Hawawini, Subramanian, and Verdin (2003)	Bamiatzi, Bozos, Cavusgil and 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%	36.87%	44.80%	48.40%	52.00%	0.00%

Sample A is the same as Schmalensee (1985), while Sample B includes some additional firms to sample A.

As table 2.0 visualizes, several empirical studies have found similar results as Rumelt (1991). McGahan and Porter (1997) found that firm effects, followed by industry effects were the main sources of firm profitability. Hawawini et al. (2003) conducted a similar study and found consistent results with Rumelt, as well as McGahan and Porter's study. Their findings suggested that firm effects were the dominant factor in determining firm profitability, followed by industry

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[2] Data from Line of Business Program of the U.S Federal Trade Commission (FTC).

effects. Similar findings were also found in 2016 by Bamiatzi et al. Their findings once more found evidence for a pronounced firm effect, indicating that firms are to a great length, responsible for their own fate. As such, in line with the resource-based view and previous empirical findings, we predict that:

Hypothesis 1: Firm effects will be more pronounced in determining firm profitability than industry effects.

2.4 Unlevered Beta

Unlevered beta or asset beta refers to the systematic risk of a firm were it unlevered. In other words, it assesses the market risk of a firm's underlying business, while disregarding any risk associated with leverage (Berk & DeMarzo, 2014). Unlevered beta will in addition give a fairly precise measure of the overall market's volatility and performance (Corporate Finance Institute, n.d.). As such, unlevered beta can be considered to be a measure of firm and industry performance.

Unlevered beta is of relevance in this thesis as it is an additional measure of performance and risk for the firms examined. Furthermore, it can give us insight of the risk associated with different industries. A common assumption is that discretionary goods or services should yield a higher unlevered beta (Damodaran, n.d.). With this follows some implications, for instance cyclical firms are associated with higher risk. Cyclical firms should thus yield a higher return and hence a higher unlevered beta compared to non-cyclical firms (Damodaran, n.d.). The same goes for firms producing luxury products compared to basic products, and costly products/services firms compared to low price products/services firms. In addition, growth firms tend to involve more risk, and should thus have higher unlevered betas (Damodaran, n.d.).

Moreover, a firm's unlevered beta also depends on the firm's operating leverage (Brealey, Myers, & Allen, 2017). As such, a greater proportion of fixed costs, and hence a high operating leverage, will raise the unlevered beta of the firm due to increased business risk. This has some implications, such that smaller and younger firms ought to have higher unlevered betas compared to large and mature firms (Damodaran, n.d.). In addition, firms with high infrastructure requirements and inflexible cost structures should have a higher unlevered beta than those with flexible cost structures (Damodaran, n.d.).

A common denominator from the above is that a higher unlevered beta represents higher systematic risk, which is the risk inherent to the overall market. Increased risk in turn, often indicates higher expected returns, which in finance is referred to as the risk-return trade-off (Risk-return tradeoff, n.d.). As such, we see that unlevered beta is associated with risk and performance for both firm and industry, and thus we hypothesise that:

Hypothesis 2: A higher unlevered beta is associated with higher returns

2.5 Degree of operating leverage

Operating leverage refers to the fraction of fixed versus variable costs and is a determinant for firm's business cycle[3] sensitivity (Bodie, Kane, & Marcus, 2014). A firm with a higher proportion of variable compared to fixed costs will to a less extent be prone to market fluctuations. This can be seen in light of a recession, where firms with a higher portion of variable as opposed to fixed costs will be able to reduce costs in line with potential declining sales. Firms with a higher proportion of fixed costs however, will have profits which fluctuate more with sales, as most costs do not change to counteract revenue fluctuations. Such firms are classified as having high operating leverage, as small fluctuations in business conditions may affect their profits.

Operating leverage can be quantified by looking at the degree of operating leverage (DOL), which measures to what extent a firm's profits are susceptible to alterations in sales (Bodie et al., 2014). As such, the degree of operating leverage may influence the market risk of a firm (Berk & DeMarzo, 2014). This can be seen as a higher proportion of fixed costs will make a firm's cash flow more sensitive to market risk, and thus increase a firm's beta. As a higher degree of operating leverage represents higher risk, following the risk-return trade-off, it is reasonable to assume that returns will rise. As such, we hypothesise that:

Hypothesis 3: A higher degree of operating leverage is associated with higher returns

2.6 Review of institutional theory

Both industrial organization economics and the resource-based view have received criticism due to their inability to sufficiently acknowledge the formal and informal institutional

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[3] Cycles of recession and recovery

constraints that provides the context of competition among industries and firms. These two theories consider institutional effects as relatively stable and merely in the "background" (Peng, Wang, & Jiang, 2008). The resource-based view fails to predict firm behaviour in changing economic conditions, such as the economic crisis of 2008. Furthermore, industrial organization economics have insufficient linkages as to how the institutional environment conceivably affect the industry structure-performance relationship (Bamiatzi et al., 2016). As formal and informal institutions affect firm strategy and performance (Peng et al., 2008), we find this theoretical view to be of relevance for our thesis.

Institutional theory focuses on the way organizations operate within a particular social system (Bamiatzi et al., 2016). As such, it concentrates on how certain specific assumptions, rules, norms and routines provide guidelines for the firm's members regarding their social behaviour and expresses the conduct that is approved and expected. Douglass C. North defines institutions as *"the rules of the game in a society"* (North, 1990, p. 3), and thus assumes that institutional forces give direction for organizations' processes and their decision making. Institutions consist of all the formal and informal constraints that structure political, economic and social interaction (North, 1991). In this manner, formal constraints may concern constitutions, laws, standards, contracts etc, whereas informal constraints typically involve codes of conduct, trust, norms of behaviour and social conventions (North, 1990).

From an economic point of view, institutions should reduce uncertainty and build a stable structure that arrange for interactions, which in turn lower both transaction costs and information costs (Hoskisson, Eden, Lau, & Wright, 2000). Institutional theory emphasizes the interaction between firm-specific resources and capabilities, industry conditions, and both formal and informal constraints posed by the institutional framework (Peng et al., 2008). In essence, institutional theory regard strategic choices and decisions to be the result of such an interaction (Peng, 2003). As such, institutions appear to be more evident than just background conditions, as it clearly affects firm's strategic choices, which in turn influence firm performance.

Neoclassical models assert that firm performance is largely contingent on the effects of technological, informational and income limits (Oliver, 1997). However, firms also depend on the constraints imposed by the institutional environment (Oliver, 1997). Institutional theory asserts that complying with social behaviour helps achieve organizational success and survival

(Baum & Oliver, 1991). As Scott points out, conformity to social expectations pays off in terms of *"increased legitimacy, resources and survival capabilities"* (Scott, 1987, p. 498). This means that firms which comply with social norms and acceptable firm actions can readily retrieve the required legitimacy, and as such, the resources and capabilities needed to survive and attain sustainable development. As such, institutional theory suggest that homogeneity is essential to achieve sustainable growth and performance (Bamiatzi et al., 2016). Hence, firm conduct does not rely on rational managerial decisions, but rather on compliance, habitual and socially defined choices (Scott, 1987).

2.7 The financial crisis of 2008-2011 and the institutional environment

The institution-based view of strategy emphasizes the importance of institutional transitions. Hence, when examining the impact of the 2008 financial crisis, institutional theory will provide useful insights regarding how changes in "the rules of the game" affects firm profitability. The financial crisis of 2008 became the most severe peacetime economic downturn since the great depression, both in terms of economical and geographical range (Claessens, Dell'Ariccia, Igan, & Laeven, 2010). This crisis impacted seriously and adversely most developed and emerging countries worldwide and led to high levels of financial stress and decreased economic activity. This made firms, industries and countries susceptible to numerous adverse events and risks (Bamiatzi et al., 2016). During such conditions, the notion of illiquidity also arose as organizations increasingly were unable to meet their obligations (Allen, 2016). In addition, the global financial crisis brought along a decline in housing and equity prices, a rise in the unemployment rate, as well as a decline in GDP per capita in most countries (Reinhart & Rogoff, 2009). Reinhart and Rogoff (2009) found that the statistics from the 2008 financial crisis were similar to the historical average macroeconomic statistics from past economic crises.

Roy E. Allen argues in his book *Financial Crises and Recession in the Global Economy* (2016), that the events that led to the 2008 crisis were in part *"fundamental changes in the basic social and technical rules of the game, or meso structure of the global economy"* (Allen, 2016, p. 114). As financial globalism became more widespread, the traditional hierarchical structured and government administered rules changed into open markets characterized by technological new thinking, decentralization and disorganized individual structures (Allen, 2016). Hence, the 2008 crisis had both a direct and indirect impact on the informal and formal institutions in many countries. The United States for instance, responded to the crisis by selling long term treasury bonds and purchasing short term bonds along with several temporary programs to get the

economy back on track. The United Kingdom and Japan initiated alike measures. In the European Union however, initiatives to slow down the debt crisis included crisis management and forced initiatives to put new policies into play. Such crisis management led to a change in the institutional organizations by adding more layers and elements to it. At the same time, initiatives such as the temporary rescue mechanisms set in action created path dependencies for additional institutional changes (Schwarzer, 2012). As such, it becomes clear that the financial crisis of 2008 had considerable effect on the institutional environment, and significantly changed the formal and informal "rules of the game".

2.8 The resource-based view incorporated with institutional theory

The resource-based view focuses on resources that are valuable, rare, difficult to copy, and non-substitutional as sources of profitability differences between firms. Despite the perspective's valuable contribution to the field of strategic management, it has failed to look beyond resources as sources of sustained competitive advantage. While the resource-based view recognizes the importance of managerial skills in generating economic rent, it does not look at the social context in which resource decisions are made, and how this context might affect a firm's sustainable advantages (Ginsberg, 1994). To incorporate the social context, we will combine the resource based-view with institutional theory.

Oliver (1997) supports a combined perspective, arguing that resource selection and sustained competitive advantage are greatly influenced by the institutional context at the individual, firm and interfirm level. This suggests that a firm's sustained competitive advantage is reliant on its capability to manage the institutional context in regard to its resource decisions. According to institutional theory, social conformity is vital in order to achieve legitimacy and social approval. However, social conformity may also lead firms to become inflexible and passive, which results in less than optimal resource decisions (Oliver, 1997). In addition, the potential for firm heterogeneity decreases and firms might become resistant to imitate resources and capabilities that lack legitimacy and social acceptance (Oliver, 1997). Rigid social conformity can therefore be damaging for firms, especially in times of economic recessions.

Recessions often operate as a cleansing mechanism for those firms not sufficiently equipped to withstand a changing competitive market (Schumpeter, 1954; Garcia-Sanchez, Mesquita, & Vassolo, 2014). However, those firms that do survive, and those that emerge stronger from the recession often score well on productivity, technological expertise, and most importantly

financial flexibility (Garcia-Sanchez et al., 2014). Recessions force firms to evaluate their strategy, reorganize their assets, and readjust their resources to survive in a changing competitive environment (Oliver, 1997).

As "the rules of the game" are changed by an economic crisis, so will the strategic factor markets with a heightened likelihood of becoming imperfect (Bamiatzi et al., 2006). The changing institutional environment along with more uncertainty causes different anticipations regarding the actual value of strategic factors (Barney, 1986). This can potentially cause resources to become unequally allocated among firms, which in turn leads to a different rent and heterogeneity potential, putting an increased emphasis on the importance of firm effects in determining firm profitability (Bamiatzi et al., 2016; Oliver, 1997). In accordance with the resource-based view combined with institutional theory, we hypothesise that:

Hypothesis 4: Firm effects will be more pronounced in determining firm profitability during recessionary periods as opposed to expansionary periods.

2.9 Industrial organization economics incorporated with institutional theory

Industrial organization economics has mainly emphasised how the characteristics of an industry structure affects firm's strategies and performance. However, the view has been criticised for its limited attention to the institutional context and how this can influence the industry structure-performance relationship (Bamiatzi et al., 2016). As such, industrial organization economics has to a great extent failed to incorporate the importance of institutions. In order to integrate the institutional context, we reconcile industrial organization economics with institutional theory.

Even though the institutional environment is not fully incorporated in industrial organization economics, it influences the industry structure, such as the quantity of sellers, the extent of product differentiation, the cost structure, and more alike. As mentioned, the institutional environment covers all the formal and informal constraints that structure political, economic and social interaction within a particular system (North, 1991), for instance an industry. Hence, changes in the institutional environment, such as new legislations or alterations in social conventions are likely to cause the industry structure to change, and potentially influence firm's performance within that industry.

Furthermore, the industry structure is greatly influenced by which stage in the industry life cycle the industry is currently in. These various industry cycles are in turn exposed to different institutional contexts. On a broad basis, industry cycles can be categorized into the following stages: ferment, growth, maturity and decline (Karniouchina, Carson, Short, & Ketchen, 2013). Few firms are publicly traded in the ferment stage (Karniouchina et al., 2013). Thus, for the purpose of this thesis, we deem this stage to not be as relevant as the others as our analysis is based on data from publicly traded companies.

The *growth* stage in the industry life cycle typically involves a high degree of heterogeneity among firms, as they offer distinct products, the innovation rate is high, and there occur frequent shifts in market shares (Klepper, 1996). Rapid structural changes often also take place during this phase (Bamiatzi et al., 2016). In addition, the entry barriers are relatively low at this stage, which makes it easy for new firms to enter the industry. The multiple new entrants vary in terms of resources and capabilities they control, which in turn causes a high degree of inter-firm heterogeneity[4] (Walker, Madsen & Carini, 2002). Hence, the relative importance of firm effects on firm performance is unavoidably essential at this stage (Karniouchina et al., 2013).

In contrast to the growth stage's radical industry changes, changes during the *maturity* stage are more incremental (Karniouchina et al., 2013), and the focus is set on facilitating efficiency (Bamiatzi et al., 2016). In regard to the institutional environment, well established rules and norms within an industry along with organizational routines, become increasingly rigid and standardized. As such, it is not uncommon that during the transition between the growth and the maturity stage, the weakest competitors exit, and increased rivalry among the remaining competitors arise (Carroll, 1985). Hence, intensified price competition and scale economies are likely to occur. As the characteristics of the maturity stage is represented by little intra-industry heterogeneity, industry effects on firm performance are likely to be more relevant at this stage, as opposed to during the growth stage (Karniouchina et al., 2013). This provides support for the industrial organization economics perspective: industry structure do affect firm profitability. This seems to particularly be the case for industries in the maturity stage.

In the industry life cycle's final stage, *decline,* the competitive forces will get more intense, as industry concentration gets stronger, and the competitors fewer. Growth declines, which in turn

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[4] Inter-firm heterogeneity refers to differences between firms.

causes increased rivalry where only the strongest competitors will survive (Porter, 1980b). Entry barriers become very high, as the remaining participants often have achieved economies of scale, efficient supply chains, and trade in international markets (Karniouchina et al., 2013; Bamiatzi et al., 2016). These factors are likely to lead to an even lower intra-industry heterogeneity, insinuating an increased importance of industry effects in determining firm profitability. Once again, this provides support for industrial organization economics view which emphasizes the importance of industry structure.

Our combination of the theory of industry life cycles and industrial organization economics suggests that industry structure is contingent on which stage in the life cycle the industry is currently in. The different stages in the industry life cycle is also affected by the institutional environment, which appears to change over time. As the industry structure combined with the institutional environment give direction for the firms' processes and decision making, the profit potential of firms relies to a great extent on these factors.

Nevertheless, when an economy goes into a recession, the institutional environment faces new challenges which often lead to additional changes. As economic cycles, such as a recession, tend to be unpredictable and difficult to control (Mascarenhas & Aaker, 1989), it causes firms to face both new opportunities and threats. Moreover, an economy in recession is typically characterised by reduced economic activity, reduced capital availability, and lower demand (Claessens et al., 2010). The 2008 financial crisis was no exception in this regard (Claessens et al., 2010). This economic downturn left industries susceptible to a multitude of adverse events and risks (Bamiatzi et al., 2016). When such abrupt economic changes occur, they cause alterations in the institutional environment and change the formal and informal "rules of the game" in order to restore order and diminish uncertainty. An example of this include the temporary prohibition of short sales in the stock market implemented in several countries during the financial crisis.

Recessions may have a substantial and protracted effect on the economy, influencing multiple industries at the same time. However, the relative impact on different industries may vary, and some industries may even avoid a decline. The findings of Garcia-Sanchez et al. (2014) imply that the most effective strategies for firms to offset recessions are innovation, new product development and customization. Despite the economic recession some industries managed to remain relatively stable, as the demand for their products or services were not particularly

sensitive to changes in the overall economy. For example, the report *McKinsey on finance 2009,* found that industries such as healthcare and consumer staples had no significant change in their EBITA[5] during the 2008 economic downturn (Jiang, Koller, & Williams, 2009).

As mentioned do major economic shocks change both formal and informal institutions, and thus, change the current structure in industries as adaptation to the new dynamics influence both rivalry and demand (Bamiatzi et al., 2016). Such environmental changes may force separate industry members to diverge from standard and consistent strategic choices, and rather apply different strategies, which altogether reduce the relative importance of industry effects on firm profitability (Bamiatzi et al., 2016). Bamiatzi et al. (2016) found in their study that industry effects lost some of their explanatory power in determining firm profitability during the 2008 recession. This correspond to the earlier findings of Majumdar and Bhattacharjee (2014), which found lower industry effects among manufacturing firms in the time of the Indian institutional transition toward liberalization.

We predict, along the lines of Bamiatzi et al. (2016) and Majumdar and Bhattacharjee (2014), that in unpredictable times, when "the rules of the game" are rapidly changing, the necessity for firm-specific strategies in order to cope with the shifting environment are more important than compliance to the industry norms. As such, we hypothesise:

Hypothesis 5: Industry effects will be less pronounced in determining firm profitability during recessionary periods as opposed to expansionary periods.

2.10 Review of country effects

As mentioned briefly in the introduction of the theory chapter, a single theory has usually not proven to be sufficient in capturing the relative importance of country effects on firm profitability (Hawawini et al., 2004). As such, the theoretical background for country effects is broader than a single perspective, and therefore more complex. In order to examine whether country effects have an impact on the conduct and performance of firms, a mix of theories originating from international business, international management, international economics and finance are applied.

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[5] EBITA = earnings before interest, taxes, and amortization

In this thesis, the home country of a firm is defined to be where their stocks are traded. This definition might cause some to claim that we present a wrong picture of reality as some firm's lists their equity on foreign stock exchanges. However, the majority of firms who have listed their equity on foreign stock exchanges are also listed at their domestic stock exchange (Hawawini et al., 2004). As we assume that the fraction of firms listed on foreign stock exchanges is rather limited, we proceed with this definition.

In times where globalization is prominent, one might anticipate that country effects and their relative importance on firm profitability would diminish. This is based on the thought that in a progressively globalized economy, a firm's home country will have reduced applicability to serve as a source of competitive advantage (Ohmae, 1991). Despite a rapid development in globalization; economic, political, social, cultural and institutional differences amid countries are still present, and affects firm's conduct and performance (Makino et al., 2004b). In fact, factors that are distinct to a country can to a great length affect a firm's strategy, and hence its profitability. Such factors include a country's size, its institutional framework, usage of production factors and technology as well as a country's legal, government and political conditions (Makino et al., 2004b).

There exists substantial research within the fields of international economics and finance regarding three home country biases that provide evidence for the existence of country effects on firm profitability. The first bias is the home country bias in internal trade. Even though international trade has had a tremendous growth in the past decades (Hawawini et al., 2004), fully integration between markets are yet to be entirely accomplished (McCallum, 1995; Chen, 2004). This indicates that trade is more pronounced within a country than between countries. While many economists disagree with Kenichi Ohmae's argument that *"national borders have effectively disappeared"* (Ohmae, 1990 p. 172), many have argued that trading agreements such as the North American Free Trade Agreement and the European Union are making borderlines become less central. McCallum (1995) however, found evidence suggesting otherwise by comparing the United States to Canada as these two were fairly similar in terms of culture, language and institutions. His research found that borderlines were in fact of relevance, supporting the bias in internal trade, and thus indicating the presence of country effects. The second bias concerns the home country bias in internal financing. Obstfeld and Rogoff (2000) found a strong correlation between domestic investments and domestic savings within the OECD countries. This supports the Feldstein-Horioka puzzle, indicating that investors do not

always seize the highest rate of return for their investments, but rather holds a home country preference. Obstfeld and Rogoff (2000) argue that these home biases for trade and investments exist because *"international trade does involve added border costs such as tariffs, nontariff barriers, and exchange risks"* (Obstfeld & Rogoff, 2000, p. 342). These biases do not need to be large in order to generate a home bias, as the links between border costs and elasticity of substitution between goods are what really matters (Obstfeld & Rogoff, 2000). The third, and final home country bias concerns internal equity investment. According to classic finance theory, rational investors should seize to diversify their portfolio internationally in order to lower unsystematic risk (Hawawini et al., 2004). Despite that a diversified international portfolio potentially would yield lower risk, investors tend to invest equities in their home country due to the bias of home country on equity investment.

Empirical research on country effects explanatory power in determining firm profitability have shown varying and often conflicting findings, with results ranging from 0,2% (Hawawini et al., 2004) to 17,7 % (Brito & Vasconcelos, 2006). However, these variations may be explained by different standards for sample selection and various methods applied. Some of the first empirical analysis on country effects compared the performance of firms in different countries. Brown, Soybel and Stickney (1994) performed their analysis in this manner and found no evident differences in profit margins.

Collins (1990) found by using performance measures such as Jensen's alpha, Treynor, Sharpe and standard deviation that firms in developed countries yielded a higher performance than those operating in less developed countries, indicating that country effects do matter. These findings were further supported by Christmann, Day and Yip (1999). By using a multiple regression model, they found strong evidence for country effects. Their research also suggested that, in line with Collins (1990), less developed countries generate a lower performance. In contrast, Makino, Beamish and Zhao (2004a) found opposing evidence, suggesting that less developed countries have higher performance.

Recent research has mostly used variance component models to determine the importance of country effects on firm profitability. For example, Hawawini et al. (2004) found a very small country effect, suggesting that firm effects dominate performance both within and between countries. On the contrary, Brito and Vasconcelos (2006) found country effects to be highly important using the same method. It is important to note that Brito and Vasconcelos findings

were based on the agriculture industry, whereas the construction industry in the same study showed a lower country effect. These differences in country effects are as expected, as the agriculture industry is more likely to depend on weather and other site-specific characteristics than the construction industry. Makino et al. (2004b) also discovered evidence for country effects and found it to be of as high importance as industry effects.

We predict that, despite a more globalised world, the effects from the home country biases are relevant for firm performance. As firms are exposed to costs of international trade such as exchange rate risk, tariffs and non-tariff barriers, domestic consumption tends to skew towards domestic produced goods (Obstfeld & Rogoff, 2000). In addition, firms are exposed to institutional differences between countries, such as corporate governance and national legislation (Kaizuka, 1997). Furthermore, firms are widely influenced by social and cultural barriers in different countries, such as differences in prevalent and accepted values, norms and behavioural patterns, as these influence key business activities (Leung, Bhagat, Buchan, Erez, & Gibson, 2005). Hence, we predict that contextual factors specific to a country do have an impact on firm conduct and profitability and hypothesise:

Hypothesis 6: Country effects will be of importance in determining firm profitability variances in developed countries.

3.0 Methodology

The purpose of this chapter is to give a thorough explanation and justification of the method applied in this thesis. As such, we will explain the statistical method applied, and how we retrieved our data.

3.1 Dataset

In order to conduct a quantitatively based analysis regarding the relative importance of firm, industry and country effects on firm profitability, we retrieved data from Thomson Reuters Eikon. This database constitutes of more than 22000 companies across 87 countries (Thomson Reuters, n.d.). From Thomson Reuters database we selected a subset of firms based in the G-10 countries, i.e. eleven developed economies; Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States (Bank of International Settlements, n.d.). These countries collaborate on economic, monetary and financial matters (Bank of International Settlements, n.d.), and are according to the human development index (HDI) classified as developed countries (United Nations Development Programme, 2016, p. 198).

As for industry classification, we have chosen to use Global Industry Classification Standards (GICS), developed by MSCI and S&P Global in 1999 (MSCI, n.d.). GICS is a hierarchical industry classification system which constitutes of 11 sectors, 24 industry groups, 68 industries and 157 sub-industries (MSCI, n.d.). In this thesis we will apply the 11 sectors as our industry classification. The firms included in our research are therefore from the following main industry sectors: 10 Energy, 15 Materials, 20 Industrials, 25 Consumer Discretionary, 30 Consumer Staples, 35 Health Care, 40 Financials, 45 Information Technology, 50 Telecommunication Services, 55 Utilities, 60 Real Estate.

Our justification for this selective sampling of country origins and industry classifications are that we wish to examine developed economies and use an industry classification which is representative for all the countries in our sample.

In order to test the effects of a changing economic environment, we divided our dataset into four different time periods based on the annual global GDP growth rate. Figure 3.0 visualizes the annual global GDP growth rate for the years 2005-2016. The first period is an expansionary period, covering the years 2005-2007. As portrayed in figure 3.0, this period is characterised

by a relatively high and stable GDP growth rate. In contrast, the years 2008-2011 reflects an overall decline in the GDP growth rate and as such, we classify this period as a recessionary period. This period extends throughout 2011 as we believe this capture some of the aftermath of the 2008 financial crisis. In addition, we include a period ranging from 2012-2016 which we have called recovery. While the period prior to recovery reflects a volatile GDP growth rate, it stabilizes in the years following 2012, nevertheless, at a lower rate than during the expansionary period. Finally, we include a period covering all years in our sample for a general overview, ranging from 2005-2016.
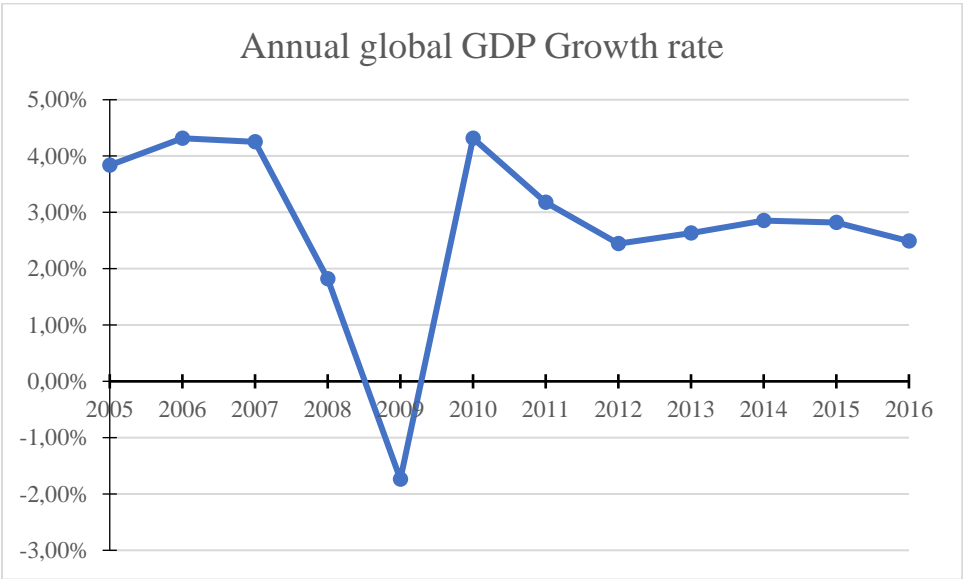
Figure 3.0: Annual global GDP growth rate (2005-2016).

(Source: adapted from the World Bank)

Several of the previous studies in the debate regarding the main source of firm profitability have applied return on assets (ROA) as their measure of firm profitability. We however, have chosen to apply return on invested capital (ROIC), also often referred to as return on capital (ROC) (Damodaran, 2007). This decision was made as we deem ROIC to be a more useful measure of firm profitability, as ROIC is considered to be a better measure compared to ROA in evaluating the performance of the underlying business (Berk & DeMarzo, 2014). In addition, we believe that by applying a different measurement of firm profitability, we can lend further insights to the ongoing debate on firm, industry and country effects on firm profitability. As different scientists calculate ROIC differently, we find it necessary to explain the formula applied in this thesis. Hence, ROIC is calculated as net income after tax for the fiscal year divided by the same

fiscal years average total long-term capital and is expressed as a percentage. Total long-term capital represents the sum of total equity, total long-term debt, deferred income tax and total other liabilities. The formula is presented in the equation below. In our mixed effects model, ROIC constitutes the variable effect.

$$ROIC = \frac{Net\ income\ after\ tax_t}{Average\ total\ long\ term\ capital_t}$$

In addition, our model includes two fixed effects, namely unlevered beta and degree of operating leverage. The unlevered beta applied in our model is retrieved from Thomson Reuters Eikon and is based on monthly observations over the last five years with available data (2012-2016). As it was not possible to attain unlevered beta for more than five years, this measure is only included in our model for the recovery period.

Unlevered beta compares the risk of a company as if it has no debt (even if this is not the case) to the market risk. As the different firms we examine operate in different markets, the market risk at which it is compared to varies for the different firms. According to Thomson Reuters (pers. mess.), they have applied the "main index" in the respective country as the market variable. Moreover, it appears that Thomson Reuters have based their calculations on Hamada's equation, which takes tax into consideration (Damodaran, 2012). Their formula is presented below:

$$\beta_u = \frac{\beta_e}{1 + (1 - t_c) * \frac{D}{E}}$$

The second fixed effect included in our model is the degree of operating leverage, which is incorporated in all the time periods examined. This measure represents the relative fraction of fixed to variable costs and is calculated as percentage change in EBIT for one fiscal year divided by percentage change in sales for the same fiscal year (Berk & DeMarzo, 2014). In order to calculate the degree of operating leverage, we have used the input of EBIT per fiscal year and total revenue per fiscal year, retrieved from Thomson Reuters Eikon. The formula we have applied is presented in the equation below:

$$Degree\ of\ operating\ leverage = \frac{\%\ change\ in\ EBIT}{\%\ change\ in\ reveues}$$

3.1.1 Limitations in the dataset

There are several measures to use in order to assess firm performance. As explained in the previous section, we have applied ROIC as our profitability measure. However, our dataset consists of data over a twelve-year time span and is thus subject to some outliers which may distort our interpretations of the data. In order for our dataset to depict the average firm, we have investigated which rates of ROIC that is normally representative for most firms.

Jiang and Koller (2006) examined the long-term pattern of ROIC from approximately 7000 publicly traded US companies during 1963 to 2004, including all sectors except for financials. During this period, the median ROIC averaged about 9,4%, with a maximum high of 11,7% and a minimum low of 7,5%, which they presented in figure 3.1 (Jiang & Koller, 2006). Their findings indicate that median ROIC remains relatively stable over time. Moreover, they found that the historical median ROIC differ considerably between industries, with differences ranging from approximately 6% to 21% for the same period. In addition, they found that there exist high intra-industry differences in median ROIC. For example, within the software services industry, median ROIC ranged from 5% to 36%. Based on Jiang and Koller's findings, we deem it appropriate to set a limit at +/- 50% ROIC for the firms in our sample. By doing so we capture most of the firms originally in our sample, while at the same time excluding those who might distort the findings of the average firm.

Figure 3.1: Median ROIC (1963-2004)

Reprinted from "A long-term look at ROIC" by B. Jiang & T. Koller, 2006, *McKinsey quarterly,* 1. Retrieved from https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/a-long-term-look-at-roic

As an attempt to avoid selection bias in our thesis, we chose not to exclude those firms that did not have complete data for the entire period examined. As such, the different time periods examined contains different amounts of firms. This might cause some problems in regard to the real effect of recession and expansion on the relative importance of firm, industry and country effects on firm profitability. However, we consider this to be more appropriate as opposed to removing a large portion of the firms in our sample, partly because firm entry and exit is part of a cohesive analysis of firm profitability.

3.2 Hierarchical linear modelling

In this thesis we will test the multilevel framework of firm, industry and country effects in determining firm profitability by using a hierarchical linear multilevel (HLM) model. In the HLM model framework aggregate levels influence less aggregate levels. In our setting this means that we analyse firm, industry and country effects to see whether they influence firm profitability. These three effects can be conceptualized as separate hierarchical levels. As firm effects (level 1) are nested within industry effects (level 2), which in turn is nested within country effects (level 3), we clearly see that our data is hierarchical in nature.

A major benefit of HLM is its ability to handle a hierarchical structure of data, as the model explicitly take into consideration the independence of errors assumption which might be violated by other models, for instance OLS regression (Short, McKelvie, Ketchen, & Chandler, 2009). Another benefit of the model is its flexibility with regard to data input. As the model does not need a balanced panel dataset in order to obtain results, it enables estimations of both random and fixed effects (Short et al., 2009). This thesis will use HLM to calculate both a mixed effects model and a variable effects model.

While HLM is a solid and flexible statistical framework for analysing data with a nested structure (Anderson, 2012), it also has some limitations. For instance, the model needs a large sample of data in order to generate adequate results, particularly for level 1 (Ozkaya et al., 2013), which in this thesis is firm effects. However, we deem a dataset consisting of 10601 firms for the overall period (2005-2016) to be sufficient. As such, this limitation is of little relevance for this thesis. Another limitation is that the model can only manage missing data at level 1 (Woltman, Feldstain, MacKay, & Rocchi, 2012). At level two and three, groups with missing data are removed (Woltman et al., 2012). While there is some missing data at the firm level (level 1), all firms have been assigned an industry (level 2) and country (level 3)

classification and hence, we have no missing data at level two and three. As such, this is no limitation in our study.

While there are many methods to use when examining the role of firm, industry and country effects on firm performance, we chose to use HLM in our study. This model assumes independence between the observations within each level. HLM simultaneously takes into account that the different levels in the hierarchy may be dependent (Short, Ketchen, Palmer, & Hult, 2007). As such, we find HLM to be particular appropriate for our nested data.

3.3 HLM assumptions

HLM assumes a linear relationship in parameters, homoscedasticity as well as normal distribution of residuals (Maas & Hox, 2004). In order to establish the validity of our analysis and data, we have conducted some diagnostic tests in STATA to see whether our dataset holds the model's assumptions. We will in addition test for multicollinearity.

3.3.1 Linearity and outliers

In order to test for linearity, we have created scatter plots of our variables which is presented in a matrix in appendix 1. As visualized in the matrix, we find no indication that the parameters are non-linear and thus we deem the linearity assumption as met.

In the scatter plot presenting degree of operating leverage and standardized residuals for the overall period we find three outliers, as seen in appendix 2. In order to examine whether these outliers were influential or not, we ran our analysis without the outliers included in the sample. We then compared the findings to our initial results, which included the outliers. As the outliers were small residuals, close to zero, in a large dataset, we expected that they would not affect the fitting line to a notable extent. Our initial expectations were met with negligible effects on parameter estimates. We therefore retained these observations in our data sample.

We also found four outliers for the recovery periods' unlevered beta and standardized residuals. However, these were different firm's than those for degree of operating leverage. We followed the same procedure for these outliers, and found no considerable changes, and thus we decided to keep them in the dataset. The difference in the coefficients for degree of operating leverage and unlevered beta with and without the outliers can be found in appendix 2.

3.3.2 Heteroscedasticity

In order to test for heteroscedasticity, we manually conducted a White test. The White test reveals that our test statistics[6] (1,0058) is lower than the lower tail critical value of the chi-square (16,919), which indicates that our residuals fluctuates in a similar manner. As such, we find no indication of heteroscedasticity. These calculations along with a two-way scatter plot are presented in appendix 3.

3.3.3 Normal distribution

In order to test for normal distribution, we made a Kernel density estimate graph. As portrayed in appendix 4, we find that the residuals of the model deviate from normal distribution and is more leptokurtic. The leptokurtic distribution can be seen as we have a Pearson kurtosis of 7,2, indicating a higher peak and fatter tails than normal distribution. Furthermore, our residuals are slightly negatively skewed, with a skewness of -0,80. However, most real-world data are not 100% normally distributed (Box, 1976), especially not economic data. Despite not meeting the normality assumption, linear regression models tend to be robust against this violation (Schmidt & Finan, 2017). As such, even though we do not have normally distributed residuals, our model can still produce valid results, particularly given our large data sample (Schmidt & Finan, 2017).

3.3.4 Multicollinearity

We also tested the correlation between the variables included in our model and found no noticeable correlation. As unlevered beta is only included in the recovery period, we conducted two separate correlation tests. The first correlation test was between ROIC and degree of operating leverage for the overall period, whereas the second correlation test was between ROIC, degree of operating leverage and unlevered beta for the recovery period. The results can be seen in appendix 5. As no noticeable correlation was found, we conclude there is no problem with multicollinearity.

3.4 Model estimation

In order to determine the variance accounting for firm, industry and country effects, we have used a three-level mixed effects model in STATA. As explained, firm effects constitute level 1, industry effects level 2, and country effects level 3. As for the variable effect we have used mean ROIC, whereas unlevered beta and degree of operating leverage make up the fixed effects.

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[6] Test statistic = n *R-squared

Degree of operating leverage is tested during the four different time periods, respectively the overall period (2005-2016), expansion (2005-2007), recession (2008-2011) and recovery (2012-2016). Unlevered beta on the other hand, will only be tested during the recovery period (2012-2016) due to limited data availability. In order to quantify to what degree firm, industry and country effects influence firm profitability, we have applied intra-class correlation coefficients. The intra-class correlation coefficient provides a measure of the total variance in firm profitability (ROIC) which is explained by the different levels we examine (firm, industry and country). As STATA only produce two intra-class correlations from our three-level model, we assume that the portion of ROIC which is not explained by industry or country effects is explained by firm effects.

In our model estimation the first level (firm effects), constitutes of the ROIC of each company examined as a function of an industry mean, degree of operating leverage and random error, as expressed in equation (1.1). This equation reflects the expansion, recession and the overall period. However, as the recovery period also includes unlevered beta, ROIC of each company in this period is examined as a function of an industry mean, degree of operating leverage, unlevered beta and random error, as expressed in equation (1.2). Hence, the equations will be as following:

$$(1.1) \quad ROIC_{fic} = \alpha_{0ic} + b_1\, DOL_{fic} + \varepsilon_{fic}$$
$$(1.2) \quad ROIC_{fic} = \alpha_{0ic} + b_1\, DOL_{fic} + b_2\, \beta u_{fic} + \varepsilon_{fic}$$

In this manner, $ROIC_{fic}$ refers to the average ROIC of firm f, which operates in industry i, which in turn is nested in country c. Furthermore, the coefficient α_{0ic} constitutes the intercept of level 1, firm effects, whereas ε_{fic} is the random firm effect, representing the deviation of firm fic's score in relation to the industry mean. These effects are presumed to be normally distributed around a mean of zero and variance σ^2_f (Raudenbush & Bryk, 2002). The coefficient $b_1\, DOL_{fic}$ is the degree of operating leverage of firm fic and the coefficient $b_2\, \beta u_{fic}$, which only is included in equation (1.2), is firm fic's unlevered beta. The letters f, i, and c respectively represents firms, industries and countries where $f = 1, 2,..., n_{ic}$ firms within industries i in country c; $i = 1, 2, …,$ I_c industries, which in turn is nested within $c = 1, 2,..., C$ countries.

The second level in the model concerns industries. We assess each industry mean, α_{0ic}, which varies randomly around a country's mean:

$$(2) \qquad \alpha_{0ic} = \delta_{00c} + z_{0ic}$$

δ_{00c} represents the mean ROIC in country c, whereas z_{0ic} represents the random industry effect, which amounts for the deviation of industry ic's mean relative to the country mean. Once more, these effects are presumed to be normally distributed around a mean of zero and variance σ^2_α (Raudenbush & Bryk, 2002).

The third level (country effects) concerns variability between countries. We assess the countries means, $\delta_{00c,}$ to vary randomly around a grand mean:

$$(3) \qquad \delta_{00c} = \Upsilon_{000} + u_{00c}$$

Υ_{000} represents the grand mean whereas u_{00c} represents the random country effect, which amounts for the deviation of country c's mean relative to the grand mean. Once again, these effects are presumed to be normally distributed around a mean of zero and variance σ^2_δ (Raudenbush & Bryk, 2002).

The purpose of this model is to divide the variability in $ROIC_{fic}$ into the three levels in the hierarchy: between firms σ^2_f (level 1), between industries σ^2_α (level 2), and between countries σ^2_δ (level 3). As such, the overall model applied in our analysis for the expansion, recession and overall period is expressed in equation (4.1), whereas the overall model for the recovery period is expressed in equation (4.2). Hence, the overall models are as following:

$$(4.1) \quad ROIC_{fic} = \Upsilon_{000} + z_{0ic} + b_1\, DOL_{fic} + u_{00c} + \varepsilon_{fic}$$
$$(4.2) \quad ROIC_{fic} = \Upsilon_{000} + z_{0ic} + b_1\, DOL_{fic} + b_2\, \beta u_{fic} + u_{00c} + \varepsilon_{fic}$$

The hierarchical linear model presents the amount of variance in ROIC within- and between group components (Raudenbush & Bryk, 2002). As such, we can calculate the intra-class correlation coefficient (ICC) for each level in the hierarchy. The intra-class correlation coefficient is a calculation of the between group variance to the total variance (Woltman et al., 2012). For country effects (level 3) the intra-class correlation coefficient is calculated as:

$$ICC_{Country} = \frac{\sigma^2_{country}}{\sigma^2_{country} + \sigma^2_{industry} + \sigma^2_{residuals}}$$

As for industry effects (level 2), the calculation of the intra-class correlation coefficient is calculated as:

$$ICC_{industry} = \frac{\sigma^2_{industry} + \sigma^2_{country}}{\sigma^2_{country} + \sigma^2_{industry} + \sigma^2_{residuals}}$$

As we have assumed that the variance in firm profitability which is not explained by industry or country effects is explained by firm effects, the calculation of the intra-class correlation for firm effects (level 1) is as follows:

$$ICC_{firm} = 1 - ICC_{country} - ICC_{industry}$$

4.0 Empirical findings

In this chapter we present the results from our analysis, along with some introductory findings obtained from the World Bank before our analysis was conducted. The discussion of our findings will first be addressed in chapter 5.

4.1 Introductory findings

Data retrieved from the World Bank indicates that the 2008 financial crisis had a severe impact on the global economy. Throughout the years 2005-2007, the annual global GDP growth rate was approximately four percent. However, in the following years the annual global GDP growth rate declined, and by 2009 the rate had dropped by more than six percent, and thus became negative. The annual fluctuations in the global GDP growth rate are shown in figure 4.0 for the years 2005-2016.
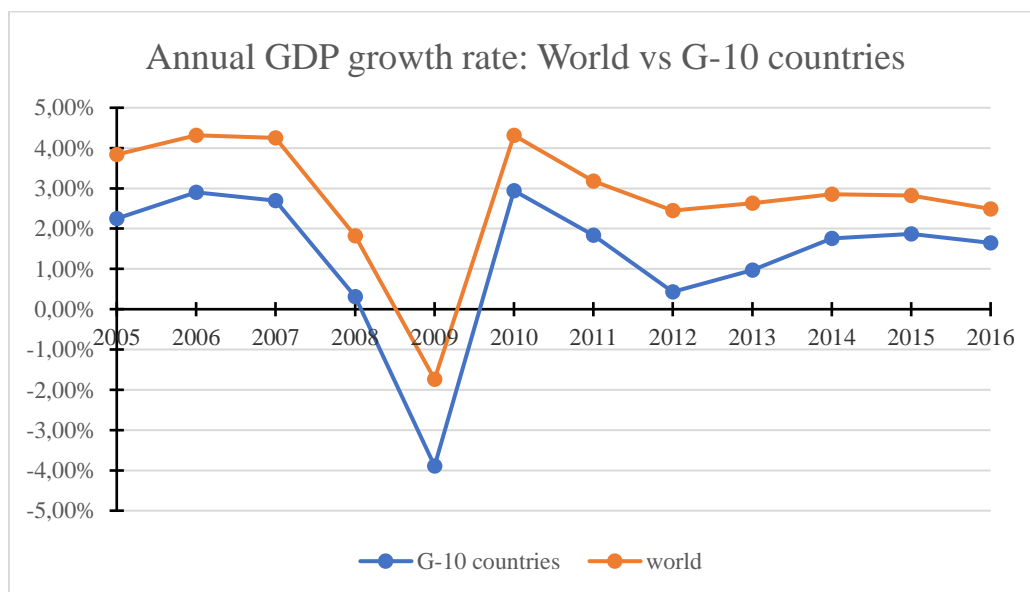
Figure 4.0: Annual GDP growth rate of the world compared to the G-10 countries (2005-2016). *(Source: adapted from the World Bank)*

In terms of global market capitalization, the world experienced a drop of 53,5%, ranging from USD 60,313 trillion down to USD 32,271 trillion between the years 2007 and 2008[7]. As such, the noticeable decline in the GDP growth rate combined with the severe loss in market capitalization give a clear indication that the 2008 financial crisis had an evident effect on the global economy. To further examine whether the 2008 financial crises had an impact on the G-

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[7] Source: the World Bank

10 countries, which is the focus of this thesis, we examined the annual mean GDP growth rate for these countries. As seen in figure 4.0, the GDP growth rate of the G-10 countries fluctuated in line with the global economy, however with consistently lower rates. As such, we see that the 2008 financial crisis had an evident effect on the G-10 countries as well.

When assessing firm profitability for the G-10 countries, we find that firm performance exhibits similar patterns as the above findings during the economic recession. This can be seen in table 4.0, section A, which presents the mean ROIC per year for the entire period (2005-2016). When examining the mean ROIC for each country, a clear pattern emerges. As seen in table 4.0, section B, there was a noticeable decline in mean ROIC between the expansionary and recessionary period. An exception is Sweden, which surprisingly had an increase in mean ROIC between the two periods. It would be interesting to examine how Sweden managed to increase profitability in a time where most countries experienced a decline. However, this is beyond the scope of this thesis, and thus not investigated any further. Nevertheless, the remaining countries experienced, in accordance with the pattern of the global economy, a decline in their mean ROIC during the recession.

Table 4.0: Descriptive statistics

Section A: Year, count and performance statistics (2005-2016)

Performance statistics per year 2005-2016			
Year	Count	Mean ROIC	Median
2005	8692	4,90%	5,75%
2006	9153	4,22%	5,52%
2007	9550	1,72%	3,72%
2008	9892	-0,55%	1,76%
2009	10302	2,04%	3,35%
2010	10617	2,48%	3,82%
2011	10977	1,68%	3,61%
2012	11402	1,76%	3,77%
2013	11865	2,08%	4,06%
2014	12223	1,52%	3,85%
2015	12492	1,55%	3,83%
2016	12098	2,46%	4,41%

Section B: Performance statistics per country

Mean ROIC Country				
	All years	**Expansion**	**Recession**	**Recovery**
Belgium	2,93%	5,29%	3,93%	3,04%
Canada	-11,69%	-8,80%	-10,19%	-9,56%
France	1,91%	7,36%	2,64%	1,66%
Germany	2,12%	6,13%	1,73%	2,40%
Italy	2,09%	5,29%	0,34%	2,74%
Japan	4,70%	4,43%	2,35%	5,67%
Netherlands	3,41%	7,96%	3,42%	2,83%
Sweden	1,08%	2,21%	2,42%	2,46%
Switzerland	5,51%	8,35%	3,54%	4,77%
United Kingdom	1,58%	4,03%	1,12%	1,41%
United States	0,32%	3,03%	1,98%	-0,03%

A similar pattern can be seen when examining the industries separately. Most of the industries experienced a decline in mean ROIC between the expansionary and recessionary period, which can be seen in table 4.1. However, also her an exception emerges, namely that of consumer staples, which had an increase in mean ROIC between the two periods. As explained in chapter 2.9 we anticipate that this is a result of relatively stable demand for the products and services produced by this industry. Overall, these findings verify that the effects of the 2008 financial crisis had an impact on the countries, industries and firms in our sample.

Table 4.1: Performance statistics per industry

Mean ROIC Industry				
	All years	**Expansion**	**Recession**	**Recovery**
Consumer Discretionary	4,10%	5,09%	3,52%	4,88%
Consumer Staples	4,88%	4,74%	5,02%	4,84%
Energy	-5,43%	0,29%	-2,79%	-6,44%
Financials	3,25%	4,41%	2,48%	4,42%
Health Care	-6,82%	-3,03%	-3,29%	-6,65%
Industrials	4,10%	5,86%	2,79%	4,58%
Information Technology	1,91%	3,72%	1,37%	2,14%
Materials	-7,74%	-5,20%	-7,18%	-6,19%
Real Estate	2,61%	3,54%	0,60%	3,47%
Telecommunication	-0,52%	2,31%	-0,25%	0,31%
Utilities	1,64%	3,46%	1,20%	1,70%

4.2 Empirical results

Table 4.2 presents the findings from our HLM and intra-class correlation analysis, showing the relative role of firm, industry and country effects on firm profitability among the G-10 countries. The findings are divided into four different time periods, respectively an overall period (2005-2016), an expansionary period (2005-2007), a recessionary period (2008-2011), and a recovery period (2012-2016). In table 4.2, section A, our analysis includes both fixed and variable effects, whereas table 4.2, section B is calculated using only variable effects. If not stated otherwise, the results presented in this thesis stem from the mixed effects model.

Table 4.2: Intra-class correlation coefficients

Section A: Results from the mixed effects model

Mixed effects model				
	All years	**Expansion**	**Recession**	**Recovery**
Firm effects	88,93%	88,54%	93,26%	90,02%
Industry effects	9,48%	8,96%	6,20%	8,67%
Country effects	1,60%	2,50%	0,54%	1,31%

Section B: Results from the variable effects model

Variable effects model				
	All years	**Expansion**	**Recession**	**Recovery**
Firm effects	83,11%	83,38%	88,94%	84,61%
Industry effects	13,94%	12,28%	8,99%	13,23%
Country effects	2,95%	4,35%	2,07%	2,16%

Firm effects versus industry effects in determining firm profitability (Hypothesis 1)

When examining the results across the entire period (2005-2016), we find that firm effects are considerably more pronounced in determining firm profitability as opposed to industry effects. This becomes clear as firm effects constitutes 88,93% of firm profitability, whereas industry effects make up 9,48% as presented in table 4.2, section A. The finding that firm effects have the highest explanatory power in determining firm profitability is consistent for all the periods examined, and thus provides strong support for hypothesis 1.

Unlevered beta and degree of operating leverage (Hypothesis 2 and 3)

Most former studies have based their analysis solely on variable effects models. We have for comparison reasons included a variable effects model in addition to our mixed effects model. Our results show that the two models yield different results in regard to the relative role of firm, industry and country effects on firm profitability. However, they both draw the same conclusion: firm effects hold the highest explanatory power in determining firm profitability, industry effects in second, and country effects in third. The differences between the two models can be seen in table 4.2, section A and B. By using the mixed effects model, we find that for the overall period (2005-2016), firm effects account for 88,93%, industry effects 9,48% and country effects 1,60% of firm profitability. In contrast, the variable effects model show for the same period that we get respectively 83,11%, 13,94% and 2,95%. Hence, we see that by using the mixed effect model, the relative importance of firm effects increases, whereas industry and country effects decreases.

As we only were able to retrieve unlevered beta for the recovery period, this is the only period we could use to test hypothesis 2. Relative to our initial expectations, we find some interesting and contradictory results, which is presented in table 4.3. For the years 2012-2016 the firms examined had a significant negative unlevered beta coefficient of -0,0093. As this finding contradict with our initial expectation, we reject hypothesis 2. In terms of degree of operating leverage, we find no significant results for any of the periods examined. This indicates that this variable has no statistically significant effect in this study. Hence, we reject the predictions of hypothesis 3.

Table 4.3: Unlevered beta and degree of operating leverage

Fixed effects coefficients				
	All years	**Expansion**	**Recession**	**Recovery**
Degree of operating leverage	4,14E-06	-4,44E-07	-2,57E-07	-3,37E-06
Unlevered beta	-	-	-	**-0,0093***

Highlighted numbers marked with a star (*) indicates significant unlevered beta at a 1 % level (P-value = 0.000).

Firm and industry effects during periods of recession and expansion (Hypothesis 4 & 5)

As presented in the introductory findings, it becomes clear that the 2008 financial crisis had an evident effect on the world economy. The expansion period however, had quite different effects on the world economy. We therefore examine the relative importance of firm and industry effects on firm profitability under these distinct economic periods. By doing so, we find firm effects to be even more prominent during the recessionary period (2008-2011) as opposed to the expansionary period (2005-2007). These findings are consistent across both models, as portrayed in table 4.2. From table 4.2, section A, we see that in the recessionary period firm effects accounts for 93,26% of the variance in firm profitability, while in the expansionary period, firm effects make up 88,54% of the variance. This leaves a difference of 4,72% between the two periods. As such, we find strong evidence for hypothesis 4.

In regard to industry effects, we find that 8,96% of the total variance in firm profitability during the expansionary period is due to industry effects. However, during the recession (2008-2011), industry effects lose some of their explanatory power, as it only accounts for 6,20% of the total variance in firm profitability. This results in a difference of 2,76% between the two distinct periods. Hence, these findings provide support for the predictions of hypothesis 5.

Country effect impacts on firm profitability (Hypothesis 6)

In terms of country effects, our results indicate that countries do matter in determining firm profitability. As presented in table 4.2, section A, we find that the total variance in ROIC explained by country effects accounts for 1,60% for the entire period (2005-2016). Hence, country effects are less important than industry effects, and markedly less relevant than firm effects in determining firm profitability. Despite being the least important factor in determining firm profitability, it is still of relevance. From our analysis, it emerges that country effects are more pronounced in expansionary periods (2,50%) as opposed to recessionary periods (0,54%). Nevertheless, country effects are at all times present even though weak. As such, our results support hypothesis 6.

5.0 Discussion

In this chapter we will discuss the relative importance of firm, industry and country effects on firm profitability through our six hypotheses. The discussion is based on results from our analysis as well as existing theory.

5.1 Firm effects and industry effects in determining firm profitability

Hypothesis 1: Firm effects will be more pronounced in determining firm profitability than industry effects.

Our first hypothesis seeks to delve into the relative importance of firm and industry effects in determining firm profitability. Following a thorough examination, we find that firm effects accounts for 88,93% of the total variance in ROIC for the overall period, and thus holds the highest explanatory power in determining firm profitability. This finding is consistent across all periods and is also in line with most previous research (Rumelt, 1991; McGahan & Porter, 1997, Hawawini et al., 2003; Bamiatzi et al., 2016). Hence, the original idea of the resource-based view, suggesting that a firm's resources and capabilities are sources of economic rent and thus what causes profitability differences among firms, seems to be valid.

While it is evident that firm effects are highly important, our findings also suggest that industry effects influence firm profitability. As proposed by industrial organization economics, characteristics distinct to an industry structure, such as rivalry between firms and market information availability, will affect firms' strategic choices and their capability to generate above normal rates of return (Bain, 1951). In line with industrial organization economics, we find that industry effects account for 9,48% of the total variance in firm's ROIC for the overall period. This implies that industry effects also influence firm profitability, but to a lesser extent than firm effects. These findings further indicate that a combination of the resource-based view and industrial organization economics might be the most beneficial approach for managers and supports Mahoney and Pandians' (1992) argument that these two theories are complementary.

In sum, we verify our initial expectations from hypothesis 1; firm effects are more pronounced in determining firm profitability than industry effects. This implies that firms are to a vast degree accountable for their own fate.

5.2 Unlevered beta and degree of operating leverage

Hypothesis 2: A higher unlevered beta is associated with higher returns

Hypothesis 3: A higher degree of operating leverage is associated with higher returns

The second and third hypothesis relate to the fixed effects included in our model. Hypothesis two concerns unlevered beta, which is only tested during the recovery period due to limited data availability. Our initial expectations regarding unlevered beta was in line with the risk-return trade-off, assuming that a higher risk expressed through unlevered beta, is associated with higher returns. However, this appears not to be the case for the firms examined during the time period 2012-2016. In fact, for this period we find a small, yet statistically significant negative coefficient for the unlevered beta, indicating that the examined firms move in the opposite direction as the overall market. As we assume that the overall market had an upturn during this period, the negative unlevered beta coefficient suggests that the overall market have performed better than the firms examined. As such, we do not find support for hypothesis 2; a higher unlevered beta is associated with higher returns.

Nevertheless, the significant unlevered beta coefficient for the recovery period is -0,0093. This theoretical value suggests that firms with a higher unlevered beta in fact yield lower returns as compared to the market during the recovery period. However, -0,0093 is a relatively small value, close to zero, which indicates that the effect of the unlevered systematic risk on ROIC is relatively low. Nonetheless, a possible issue with a large data sample as ours, is that the statistical significance might not reflect the practical significance (Kirk, 1996). In terms of our analysis, this means that irrelevant effects may become statistically significant due to the large sample. Hence, our finding of such a small negative unlevered beta coefficient might not reflect the true practical value of the unlevered beta coefficient. In practical terms, it seems unlikely that the recovery periods sample, consisting of 9498 firms, will all together yield a negative unlevered beta.

As for the degree of operating leverage, our analysis finds no significant results. When non-significant results are detected from such a large sample, it is a strong indication that this factor indeed is not significant. As such, we reject hypothesis 3; a higher degree of operating leverage is associated with higher returns. As degree of operating leverage only serves as a proxy for the firm's actual operating leverage, this might provide some explanation as to why we find no significant results. While operating leverage would have been a better measure for our analysis,

its requirement for detailed information regarding a firm's fixed and variable costs excluded this option as such data was not possible to retrieve. As such, even though we find no significant results for this variable in our study, this does not necessarily mean that it will not turn out to be significant in other studies.

In regard to the relative importance of firm, industry and country effects in determining firm performance, we see that the mixed effects model and the variable effects model yield different explanatory power to each effect. Nonetheless, this finding is no surprise, as additional variables incorporated in the model will naturally cause alterations in the output. While the degree of operating leverage only reflects firm-specific characteristics, unlevered beta incorporates risk associated with both firm and industry-specific factors. Hence, our findings indicate that by including one or both of these factors, the relative importance of firm effects in determining firm profitability increases at the expense of industry and country effects. A common denominator across all periods is that when compared to the variable effects model, the mixed effects model causes industry effects to lose more of its explanatory power as opposed to country effects. This indicates that country effects are not as strongly connected to firm-specific risks as industry effects are.

5.3 Firm effects during periods of recession and expansion
Hypothesis 4: Firm effects will be more pronounced in determining firm profitability during recessionary periods as opposed to expansionary periods.

As hypothesis 1 confirms, firm effects have the highest explanatory power in regard to differences in firm profitability. When examining the role of firm effects in the context of a changing economic environment, we find evidence which indicate that firm effects become even more pronounced in determining profitability variances during a recession. A potential explanation for the increased importance of firm effects during a recession, is that an economy in decline typically is characterized by reduced economic activity, reduced capital availability and lower demand (Claessens et al., 2010). This in turn might cause firms to face harder terms in regard to achieving and sustaining economic rent, and thus creating an increased emphasis on firm effects. Our finding that firm effects are more pronounced during a recession is in line with the findings of Bamiatzi et al. (2016) and arguments of Oliver (1997). They both argue that during an economic crisis, firms often defy previous traditions as a response to a changing institutional environment, which in turn can cause resource allocation to become unequally

distributed. As a result, firms may experience a different rent and heterogeneity potential. Hence, an increased emphasis is put on the individual firm, as firm effects become even more important in determining firm profitability during a recession.

As such, a recession can impact the way firms operate and thus their potential to earn above average rate of returns (Oliver, 1997). Hence, when facing periods of recession, a firm's ability to manage the institutional environment in regard to its resources and strategy becomes increasingly important for firm profitability. This is validated as firm effects account for 93,26% of the profitability variances during the recession, which is higher than all the other periods examined. As such, we find support for hypothesis 4; firm effects will be stronger in recessionary periods as opposed to expansionary periods.

5.4 Industry effects during periods of recession and expansion
Hypothesis 5: Industry effects will be less pronounced in determining firm profitability during recessionary periods as opposed to expansionary periods.

As established earlier, industry effects do influence firm profitability. However, in the context of a recession, our findings indicate that industry effects appear to lose some of their explanatory power in determining profitability differences as compared to the expansionary period. This corresponds with the findings of Bamiatzi et al. (2016) and Majumdar and Bhattacharjee (2014). They argued that under a changing economic environment when "the rules of the game" changes, firm effects become more important in order to deal with the context of a changing economic environment as opposed to compliance with industry norms. Hence, when facing periods of recession, strategic choices and capabilities become more prominent in determining firm profitability at the cost of industry effects. This can be seen as the explanatory power of firm effects increased, while industry effects fell from 8,96% in the expansion period down to 6,20% in the recession period. As such, our analysis provide support for hypothesis 5; industry effects will be weaker in recessionary periods as compared to expansionary periods.

Even though our analysis detects that the overall impact of a recession will cause industry effects to lose some of their explanatory power in determining firm profitability, this is a finding with modifications. This is only true when examining the impact of a recession for all the industries combined. However, not all industries experienced a decline during the recession, which becomes evident when examining the industries individually. The consumer staples

sector for instance, had 0,28% higher mean ROIC during the recessionary period as compared to the expansionary period. Nonetheless, a recession will naturally impact separate industries differently. For instance, the *energy* sector's mean ROIC declined by -3,08% from the expansionary to the recessionary period, whereas *health care* only had a decline of -0,26%.

5.5 Country effects in determining firm profitability
Hypothesis 6: Country effects will be of importance in determining firm profitability variances in developed countries.

In 2016 the eleven countries included in our sample represented 50,06% of the world's total GDP[8], which indicates that our sample gives a fairly adequate representation of the world's developed economies. At first glance, one might anticipate that developed countries have so well established institutional frameworks and efficient markets that the opportunities to utilize market imperfections and acquire economic rent are rather limited. Nonetheless, the overall findings from our analysis suggest that country effects do matter in determining firm profitability in developed countries. This is in line with institutional theory, which argues that national contextual features affect firm behaviour and conduct, and thus, also their economic performance (Kaizuka, 1997).

However, many of the previous studies seeking to explain the determinants of firm performance have assumed country effects to be constant and have mainly based their research on theories from industrial organization economics and/or the resource-based view. Our analysis indicates that treating country effects as a constant is poorly founded, as countries varies on a wide range of characteristics which might have an impact on firm performance. We find that country effects indeed influence firm performance. This is validated as country effects account for 1,60% of the total variance in firm's ROIC during the entire period (2005-2016). Even though this is a somewhat small effect, it is still of relevance and should not be ignored. However, if emerging economies were to be included in our analysis, we believe that country effects' explanatory power in regard to firm profitability differences would have been higher. This is based on the assumption that emerging economies do not hold established institutional frameworks and efficient markets to the same extent as developed economies. Thus, we believe that

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[8] Own calculations based on data retrieved from World Bank

opportunities to utilize market imperfections and attain economic rent are more prominent in emerging economies.

However, when examining country effects over a long period of time, one must be aware of changing national environments. As such, examining country effects over a twelve-year time span, might leave out the relevance of changing national environments. Examples of such changes include alterations in a country's economic, political, social, cultural and institutional environment (Makino et al., 2004b). We have therefore examined the relative importance of country effects in determining firm profitability during four time periods, respectively expansion (2005-2007), recession (2008-2011), recovery (2012-2016), as well as the overall period (2005-2016). By comparing the estimates of country effects in these periods, our results suggest that changing national environments are of relevance. This becomes evident when looking at Switzerland for instance, which experienced a fall in mean ROIC from 8,35% in the expansion period down to 3,54% in the recessionary period.

In sum, we find that country effects do have an impact on firm profitability, independent of the period examined. As such, we find support for hypothesis 6; country effects will be of importance in determining profitability variances in developed countries. This is in line with previous empirical findings (Makino et al., 2004b; Goldszmidt et al., 2011; Brito & Vasconcelos, 2006). Nevertheless, our results suggest that the relative importance of country effects fluctuate over time, though always present.

5.6 Limitations

Limitations will almost always be present in research papers, and it appears that no study is completely flawless. Our thesis is no exception in this regard. We acknowledge that this thesis in fact holds several limitations and will in this chapter address those we consider most prominent.

This thesis has employed the accounting measure ROIC in order to assess firm profitability. Even though ROIC has its strengths, it also has some weaknesses. The biggest weakness of ROIC in the context of our thesis is that it does not take into consideration different accounting policies applied in different countries (Hawawini et al., 2003). As such, the true value of the underlying measurers might be distorted. By applying measures that account for this weakness, one might obtain more representative findings. Ideally, we would have liked to compare our

results with other performance measures. However, due to limited data availability and time restrictions, we were not able to do so. Nevertheless, an advantage of ROIC is that it allows for comparisons of firms with different reporting currencies. In addition, it is a widely used performance measure. As such, we deem the accounting measure of ROIC to be appropriate for the purpose of this thesis.

The second limitation is that our analysis is subject to some selection bias as we sat a limit at +/- 50% ROIC for the firms in our sample. This leaves out those firms with abnormal high/low ROIC from our analysis. Such a sample bias might affect the statistical significance of our analysis, causing distorted results. However, we deem this constraint to be necessary in order to reflect the average firm, as discussed in chapter 3.1.1.

A third limitation worth mentioning concerns unlevered beta. While Thomson Reuters Eikon only provides unlevered beta based on monthly observations over the last five years (2012-2016), we would have preferred unlevered beta as a time series for the twelve years examined. However, due to limited data availability we were only able to include unlevered beta in our model for the recovery period.

Although we recognize that this thesis has its limitations, we still feel reasonably comfortable that our study will yield valuable contributions to the ongoing discussion within strategic management regarding the relative importance of firm, industry and country effects on firm profitability. Nevertheless, future research might incorporate these limitations, and thus further improve the study.

5.7 Implications

Through our analysis we have found evidence indicating that firm, industry and country effects do all influence firm profitability. As such, this thesis offers three main implications for firm managers. The first implication concerns the role of firm and industry effects in determining firm profitability. As such, we have thoroughly examined two main theories within strategic management, namely the resource-based view and industrial organization economics. These two theories offer different perspectives to managers regarding the main source of profitability differences among firms. While industrial organization economics emphasises the importance of industry structure, the resource-based view addresses the relevance of a firm's distinctive attributes. For managers striving to distinguish which theory has the largest explanatory power

in regard to determining firm profitability, our findings support the resource-based view logic. As such, managers should focus on firm-specific attributes. Nevertheless, our findings also suggest that industry holds an important role in determining firm profitability, and as such, managers should not disregard the importance of industrial organization economics. As such, we believe that treating the resource-based view and institutional organization economics as complementary, rather than competing views, will lead firms to set forth strategies which will yield higher performance.

A second implication concerns managers' focus in times of shifting economic conditions. A severe economic shock, like the 2008 financial crisis had considerable effects on the institutional environment, and thus, changed both the formal and informal "rules of the game". Our analysis reveals that the relative importance of firm effects in determining firm profitability seems to be especially amplified during recessions, whereas industry effects lose some of their explanatory power during recessionary periods. As Oliver (1997) points out, maintaining economic rent is primarily contingent on the social context in which resource decisions are made. Therefore, in times of recessions managers should hold a great focus on firm specific attributes, while simultaneously incorporating the institutional context in which they operate.

A third implication concerns country effects and their relative importance in determining firm profitability. From our analysis we find evidence that country effects are indeed important to firm performance. This result suggests that managers need to look beyond both the resource-based view and industrial organization economics which tend to treat country effects as a constant. In fact, characteristics distinct to a country can to a great length influence a firm's profitability and as such, managers need to incorporate country effects when developing strategies.

Our research has shown that firm managers should focus on firm-specific attributes following the resource-based view, while simultaneously recognizing the importance of industrial organization economics. Moreover, the focus on firm-specific attributes combined with the institutional context become even more important in times of shifting economic environments. Finally, country effects cannot be ignored as a factor influencing firm profitability.

5.8 Future research

After a thorough evaluation of our thesis, it becomes clear that there exists a great potential for further research. First and foremost, future studies should consider applying alternative performance measures. We have applied ROIC as an indicator for firm performance, however as it becomes clear in the limitations chapter, this measure has its weaknesses. Hence, future research could consider applying different performance measures, such as economic profit/loss, growth, or enterprise value ratios.

Furthermore, this thesis has only examined the relative importance of firm, industry and country effects in determining firm profitability among publicly traded companies. Future research might extend this research by including privately held companies, and as such obtain a broader picture of firms. In addition, one could examine only privately held companies and investigate whether there is a correspondence in the relative role of firm, industry and country effects on firm profitability to those of publicly traded companies.

For researchers with a stronger macroeconomic background, it would be interesting to examine the potential effect different currencies might have on firm profitability in times of expansion and recession. That is, whether the existence of an own national currency leads to self-correction? If the currency depreciates compared to other currencies, it might cause firms who operate in a competitive industry to have a boost in their exports. On the contrary, if the currency appreciates compared to other currencies, it might cause the competitive environment in an industry to face harder terms. As such, it would be interesting to examine these currency effects and its potential impact on the relative importance of firm, industry and country effects in determining firm profitability.

Finally, as our analysis established that country effects influence firm performance, future research might examine why there exist a substantial difference in mean ROIC between developed economies. In addition, it would be interesting to examine what causes changes in the relative importance of country effects on firm profitability over time. By incorporating variables that characterise national environments, for instance degree of institutional development, one could bring valuable contributions to the discussion regarding the role of country effects on firm profitability.

6.0 Conclusion

This thesis revisits one of the major discussions within strategic management research, namely the relative importance of firm, industry and country effects on firm profitability. Despite considerable research within the field, the debate is still ongoing as certain influences on firm profitability are yet to be established and lack sufficient research. As such, there exist interest towards understanding profitability variances between firms. This is particularly of interest for firm managers in order to make decisions and take actions that will yield higher firm profitability.

This thesis seeks to answer the research question: *to what degree do firm, industry and country effects influence firm profitability?* The analysis is based on data from the G-10 countries during the time period 2005-2016, using ROIC as a performance measure. To answer the research question, we created six hypotheses covering the traditional discussion of firm, industry and country effects on firm profitability. The hypotheses also incorporate the effects of a changing economic environment, unlevered beta and degree of operating leverage. As such, this thesis brings along new insights to the discussion regarding the main source of firm profitability.

The results from our analysis provide evidence that firm effects are more pronounced in determining firm profitability as opposed to industry effects, for all the periods examined. As such, in line with the resource-based view logic, it is to a great length a firm's resources and capabilities that causes economic rent, and thus, profitability differences between firms. In the context of a recessionary period, firm effects become increasingly important in determining firm performance. This indicates that when "the rules of the game" are changing as a result of an economic downturn, firm heterogeneity becomes increasingly important. While firm effects gain importance during the recessionary period, our analysis indicate that industry effects lose some of their value in determining firm performance. This suggest that changes in the informal and formal context may oblige firms to apply firm-specific strategies, at the cost of conformity with industry norms. As for country effects, our results find evidence supporting the notion that country effects do indeed impact firm performance in developed countries. Thus, despite a globalized world, national contextual features have an influence on firm behaviour as well as their economic performance.

While most previous studies have used a variable effects model, we ran our analysis as a mixed effects model, as we brought in the fixed effects unlevered beta and degree of operating leverage

from corporate finance. From our analysis we find a small statistically significant negative coefficient for the unlevered beta during the recovery period (2012-2016). This indicates that a higher unlevered beta yields lower returns as compared to the market, as we assume that the market had an upturn during this period. However, although we found statistical significance, we question the practical significance of this finding, and encourage future researchers to further investigate this. As for degree of operating leverage, we found no statistically significant results in this study. As such, we find no evidence which indicates that a higher degree of operating leverage is associated with higher returns.

From our multilevel approach it becomes clear that firms are to a vast degree accountable for their own fate as firm-specific effects constitute for the majority of the variance in firm profitability. As such, firms should focus on exploiting their internal resources and capabilities in a manner that leads to a sustained competitive advantage. This focus is increasingly important during an economic downturn, as the relative importance of firm effects in determining firm profitability becomes particularly amplified during such periods. Despite not being as influential as firm effects, managers should not ignore the importance of both industry and country effects in determining firm profitability. As such, when developing firm strategies, managers should focus on firm-specific effects, while simultaneously incorporating the impact from industry and country effects.

References

Allen, R. E. (2016). *Financial crises and recession in the global economy*. Cheltenham: Edward Elgar Publishing.

Anderson, D. (2012). *Hierarchical linear modeling (HLM): An introduction to key concepts within cross-sectional and growth modeling frameworks.* (Technical Report No. 1308). University of Oregon, Oregon: Behavioral Research and Teaching. Retrieved from http://files.eric.ed.gov/fulltext/ED545279.pdf

Bain, J. (1950). Workable Competition in Oligopoly: Theoretical Considerations and Some Empirical Evidence. *The American Economic Review, 40*(2), 35-47. Retrieved from http://www.jstor.org/stable/1818021

Bain, J. S. (1951). Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940. *The Quarterly Journal of Economics, 65*(3), 293-324. Retrieved from http://www.jstor.org/stable/1882217

Bain, J. (1954). Economies of Scale, Concentration, and the Condition of Entry in Twenty Manufacturing Industries. *The American Economic Review, 44*(1), 15-39. Retrieved from http://www.jstor.org/stable/1803057

Bain, J. (1968). *Industrial organization* (2nd ed). New York: John Wiley & Sons, Inc.

Bamiatzi, V., Bozos, K., Cavusgil, S.T., & Hult, T. M. (2016). Revisiting the firm, industry, and country effects on profitability under recessionary and expansion periods: A multilevel analysis. *Strategic Management Journal, 37*(7), 1448-1471. doi: https://doi.org/10.1002/smj.2422

Bank of international settlements (n.d.). *G10.* Retrieved from https://www.bis.org/list/g10publications/

Barney, J. B. (1986). Strategic factor markets: Expectations, luck, and business strategy. *Management science*, *32*(10), 1231-1241. doi: https://doi.org/10.1287/mnsc.32.10.1231

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management, 17*(1), 99-120. doi: https://doi.org/10.1177/014920639101700108

Baum, J. A. C., & Oliver, C. (1991). Institutional Linkages and Organizational Mortality. *Administrative Science Quarterly, 36*(2), 187-218. Retrieved from http://www.jstor.org/stable/2393353

Berk, J., & DeMarzo, P. (2014). *Corporate finance* (3rd ed.). Harlow: Pearson Education Limited.

Bodie, Z., Kane, A., & Marcus, A. J. (2014). *Investments* (10th ed.). Berkshire: McGraw-Hill Education.

Box, G. E. (1976). Science and statistics. *Journal of the American Statistical Association*, *71*(356), 791-799. Retrieved from http://www.jstor.org/stable/2286841

Brealey, R., Myers, S., & Allen, F. (2017). *Principles of corporate finance* (12th ed., The McGraw-Hill/Irwin series in finance, insurance, and real estates). New York: McGraw-Hill Education.

Brito, L. A., & Vasconcelos, F. C. (2006). How much does country matter? In: Cooper A, Alvarez S, Carrera A, Mesquita L, Vassolo R. (2006). *Entrepreneurial strategies: New technologies and emerging markets.* Malden, Massachusetts: Blackwell publishing. pp. 95-113.

Brown, P. R., Soybel, V. E., & Stickney, C. P. (1994). Comparing US and Japanese corporate-level operating performance using financial statement data. *Strategic Management Journal, 15*(1)*, 75-83.* doi: http://dx.doi.org/10.1002/smj.4250150106

Carroll, G. R. (1985). Concentration and Specialization: Dynamics of Niche Width in Populations of Organizations. *American Journal of Sociology, 90*(6), 1262-1283. doi: https://doi.org/10.1086/228210

Chen, N. (2004). Intra-national versus international trade in the European Union: why do national borders matter? *Journal of international economics, 63*(1), 93-118. doi: https://doi.org/10.1016/S0022-1996(03)00042-4

Christmann, P., Day, D., & Yip, G. S. (1999). The relative influence of country conditions, industry structure, and business strategy on multinational corporation subsidiary performance. *Journal of International Management*, *5*(4), 241-265. doi: https://doi.org/10.1016/S1075-4253(99)00015-0

Claessens, S., Dell'Ariccia, G., Igan, D., & Laeven, L. (2010). Cross-country experiences and policy implications from the global financial crisis. *Economic Policy*, *25*(62), 267-293. doi: https://doi.org/10.1111/j.1468-0327.2010.00244.x

Collins, J. M. (1990). A market performance comparison of US firms active in domestic, developed and developing countries. *Journal of International business studies*, *21*(2), 271-287. doi: https://doi.org/10.1057/palgrave.jibs.8490335

Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: do we have a new theory of the firm? *Journal of management*, *17*(1), 121-154. doi: https://doi.org/10.1177/014920639101700109

Corporate Finance Institute. (n.d.) *Unlevered Beta/Asset Beta.* Retrieved from https://corporatefinanceinstitute.com/resources/knowledge/valuation/unlevered-beta-asset-beta/

Damodaran, A. (n.d.). *Determinants of betas* (PowerPoint slides). Retrieved from http://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/discrate2.pdf

Damodaran, A. (2007). *Return On Capital (ROC), Return on Invested Capital (ROIC) and Return on Equity (ROE): Measurement and Implications*. New York: Stern School of Business.

Damodaran, A. (2012). *Investment valuation: Tools and techniques for determining the value of any asset* (3rd ed., Wiley finance series). Hoboken, N.J: Wiley.

David, F. R. (2011). *Strategic management: Concepts and cases (13th ed.)*. Upper Saddle River, N.J: Prentice Hall/Pearson.

Garcia-Sanchez, J., Mesquita, L. F., & Vassolo, R. S. (2014). What doesn't kill you makes you stronger: The evolution of competition and entry-order advantages in economically turbulent contexts. *Strategic Management Journal*, *35*(13), 1972-1992. doi: http://dx.doi.org/10.1002/smj.2189

Ginsberg, A. (1994). Minding the competition: From mapping to mastery. *Strategic Management Journal*, *15*(S1), 153-174. Retrieved from http://www.jstor.org/stable/2486816

Goldszmidt, R. G. B., Brito, L. A. L., & Vasconcelos, F. C. D. (2011). Country effect on firm performance: A multilevel approach. *Journal of business research, 64*(3), 273-279. doi: https://doi.org/10.1016/j.jbusres.2009.11.012

Hawawini, G., Subramanian, V., & Verdin, P. (2003). Is Performance Driven by Industry- or Firm-Specific Factors? A New Look at the Evidence. *Strategic Management Journal, 24*(1), 1-16. Retrieved from http://www.jstor.org/stable/20060508

Hawawini, G., Subramanian, V., & Verdin, P. (2004). The home country in the age of globalization: how much does it matter for firm performance. *Journal of World Business, 39*(2), 121-135. doi: https://doi.org/10.1016/j.jwb.2003.08.012

Hoskisson, R., Eden, L., Lau, C., & Wright, M. (2000). Strategy in Emerging Economies. *The Academy of Management Journal, 43*(3), 249-267. Retrieved from http://www.jstor.org/stable/1556394

Jiang, B., & Koller, T. (2006, February). A long-term look at ROIC. *McKinsey Quarterly*, *1*. Retrieved from https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/a-long-term-look-at-roic

Jiang, B., Koller, T. M., & Williams, Z. D. (2009). Mapping decline and recovery across sectors. *McKinsey on Finance*, 21-25. Retrieved from https://www.mckinsey.com/Client_Service/Corporate_Finance/Latest_thinking/McKinsey_on_Finance/~/media/McKinsey/dotcom/client_service/Corporate%20Finance/MoF/PDF%20issues/MoF_Issue_30_Winter%2009.ashx

Kaizuka, K. (1997). Institutional Differences between Developed Countries. *The Japanese Economic Review*, *48*(1), 1-17. doi: https://doi.org/10.1111/1468-5876.00032

Karniouchina, E. V., Carson, S. J., Short, J. C., & Ketchen, D. J. (2013). Extending the firm vs. industry debate: Does industry life cycle stage matter? *Strategic management journal*, *34*(8), 1010-1018. doi: https://doi.org/10.1002/smj.2042

Kirk, R. E. (1996). Practical significance: A concept whose time has come. *Educational and psychological measurement*, *56*(5), 746-759. doi: https://doi.org/10.1177/0013164496056005002

Klepper, S. (1996). Entry, Exit, Growth, and Innovation over the Product Life Cycle. *The American Economic Review, 86*(3), 562-583. Retrieved from http://www.jstor.org/stable/2118212

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: a review and assessment of its critiques. *Journal of management*, *36*(1), 349-372. doi: https://doi.org/10.1177/0149206309350775

Leung, K., Bhagat, R. S., Buchan, N. R., Erez, M., & Gibson, C. B. (2005). Culture and international business: Recent advances and their implications for future research. *Journal of international business studies, 36*(4), 357-378. doi: https://doi.org/10.1057/palgrave.jibs.8400150

Maas, C. J., & Hox, J. J. (2004). The influence of violations of assumptions on multilevel parameter estimates and their standard errors. *Computational statistics & data analysis*, *46*(3), 427-440. doi: https://doi.org/10.1016/j.csda.2003.08.006

Mahoney, J. T., & Pandian, J. R. (1992). The resource-based view within the conversation of strategic management. *Strategic management journal*, *13*(5), 363-380. doi: https://doi.org/10.1002/smj.4250130505

Majumdar, S. K., & Bhattacharjee, A. (2014). Firms, Markets, and the State: Institutional Change and Manufacturing Sector Profitability Variances in India. *Organization Science, 25*(2), 509-528. doi: https://doi.org/10.1287/orsc.2013.0844

Makino, S., Beamish, P. W., & Zhao, N. B. (2004a). The characteristics and performance of Japanese FDI in less developed and developed countries. *Journal of world business*, *39*(4), 377-392. doi: https://doi.org/10.1016/j.jwb.2004.08.009

Makino, S., Isobe, T., & Chan, C. M. (2004b). Does Country Matter? *Strategic Management Journal, 25*(10), 1027-1043. Retrieved from http://www.jstor.org/stable/20142175

Mascarenhas, B., & Aaker, D. A. (1989), Strategy over the business cycle. *Strategic management Journal, 10*(3), 199–210. doi: https://doi.org/10.1002/smj.4250100302

Mason, E. S. (1939). Price and Production Policies of Large-Scale Enterprise. *The American Economic Review, 29*(1), 61-74. Retrieved from http://www.jstor.org/stable/1806955

McCallum, J. (1995). National Borders Matter: Canada-U.S. Regional Trade Patterns. *The American Economic Review, 85*(3), 615-623. Retrieved from http://www.jstor.org/stable/2118191

McGahan, A., & Porter, M. (1997). How Much Does Industry Matter, Really? *Strategic Management Journal, 18*, 15-30. Retrieved from http://www.jstor.org/stable/3088208

McKinsey & Company. (2008, July). Enduring Ideas: The SCP Framework. *McKinsey Quarterly, 2.* Retrieved from: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/enduring-ideas-the-scp-framework

MSCI. (n.d.). *The global industry classification standards (GICS).* Retrieved from https://www.msci.com/gics

North, D. C. (1990). Institutions, institutional change, and economic performance. Cambridge: Cambridge University Press.

North, D. C. (1991) Institutions. *The Journal of Economic Perspectives, 5*(1), 97-112. Retrieved from http://www.aeaweb.org/articles?id=10.1257/jep.5.1.97

Obstfeld, M., & Rogoff, K. (2000). The Six Major Puzzles in International Macroeconomics: Is There a Common Cause? *NBER Macroeconomics Annual, 15*, 339-390. doi: https://doi.org/10.1086/654423

Ohmae, K. (1990). *The borderless world.* London: William Collins & Co. Ltd.

Ohmae, K. (1991). The Rise of the Region State. *Foreign Affairs, 72*(2), 78-87. doi: https://doi.org/10.2307/20045526

Oliver, C. (1997). Sustainable competitive advantage: Combining institutional and resource-based views. *Strategic management journal,* 18(9) 697-713. Retrieved from http://www.jstor.org/stable/3088134

Ozkaya, H. E., Dabas, C., Kolev, K., Hult, G. T. M., Dahlquist, S. H., & Manjeshwar, S. A. (2013). An assessment of hierarchical linear modeling in international business, management, and marketing. *International Business Review*, *22*(4), 663-677. doi: https://doi.org/10.1016/j.ibusrev.2012.10.002

Peng, M. W. (2003). Institutional transitions and strategic choices. *Academy of management review, 28*(2), 275-296. Retrieved from http://www.jstor.org/stable/30040713

Peng, M. W., Wang, D. Y. L., & Jiang, Y. (2008). An institution-based view of international business strategy: a focus on emerging economies. *Journal of International Business Studies, 39*(5), 920-936. doi: https://doi.org/10.1057/palgrave.jibs.8400377

Porter, M. E. (1980a). Industry structure and competitive strategy: keys to profitability. *Financial Analysts Journal, 36*(4), 30-41. Retrieved from http://www.jstor.org/stable/4478361

Porter, M. E. (1980b) *Competitive Strategy: Techniques for analyzing industries and competitors.* New York: Free Press.

Porter, M. E., & Millar, V. E. (1985, July). How information gives you competitive advantage. *Harvard Business review.* Retrieved from https://hbr.org/1985/07/how-information-gives-you-competitive-advantage

Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed., Vol. 1, Advanced quantitative techniques in the social sciences). Thousand Oaks: Sage Publications.

Reinhart, C. M., & Rogoff, K. S. (2009). The aftermath of financial crises. *American Economic Review*, *99*(2), 466-72. Retrieved from http://www.jstor.org/stable/25592442

Risk-return tradeoff (n.d.). *NASDAQ Financial Glossary.* Retrieved from https://www.nasdaq.com/investing/glossary/r/risk-return-trade-off

Roquebert, J. A., Phillips, R. L., & Westfall, P. A. (1996). Markets vs. Management: What "drives" profitability? *Strategic Management Journal, 17*(8), 653-664. Retrieved from http://www.jstor.org/stable/2486831

Rumelt, R. P. (1991). How Much Does Industry Matter? *Strategic Management Journal, 12*(3), 167-185. Retrieved from http://www.jstor.org/stable/2486591

Rumelt, R. P., Schendel, D., & Teece, D. J. (1991). Strategic Management and Economics. *Strategic Management Journal, Vol. 12*(S2), 5-29. doi: http://dx.doi.org/10.1002/smj.4250121003

Schmalensee, R. (1985). Do Markets Differ Much? *The American Economic Review, 75*(3), 341-351. Retrieved from http://www.jstor.org/stable/1814804

Schmidt, A. F., & Finan, C. (2017). Linear regression and the normality assumption. *Journal of clinical epidemiology*. doi: https://doi.org/10.1016/j.jclinepi.2017.12.006

Schoemaker, P. J. H. (1990). Strategy, Complexity and Economic Rent. *Management Science, 39*(10), 1178-1192. doi: https://doi.org/10.1287/mnsc.36.10.1178

Schumpeter, J. (1954). *Capitalism, socialism and democracy* (4th ed). London: Unwin University Books.

Schwarzer, D. (2012). The Euro area crises, shifting power relations and institutional change in the European Union. *Global Policy*, *Vol. 3*(s1), 28-41. doi: http://dx.doi.org/10.1111/1758-5899.12013

Scott, W. (1987). The Adolescence of Institutional Theory. *Administrative Science Quarterly, Vol. 32*(No.4), 493-511. Retrieved from http://www.jstor.org/stable/2392880

Short, J. C., Ketchen, D. J., Palmer, T. B., & Hult, G. T. M. (2007). Firm, strategic group, and industry influences on performance. *Strategic management journal, 28*(2), 147-167. doi: https://doi.org/10.1002/smj.574

Short, J. C., McKelvie, A., Ketchen, D. J., & Chandler, G. N. (2009). Firm and industry effects on firm performance: A generalization and extension for new ventures. *Strategic Entrepreneurship Journal*, *3*(1), 47-65. doi: https://doi.org/10.1002/sej.53

Spanos, Y., & Lioukas, S. (2001). An Examination into the Causal Logic of Rent Generation: Contrasting Porter's Competitive Strategy Framework and the Resource-Based Perspective. *Strategic Management Journal, 22*(10), 907-934. Retrieved from http://www.jstor.org/stable/3094376

Thomson Reuters. (n.d.). *Content and analytics.* Retrieved from https://financial.thomsonreuters.com/en/products/tools-applications/trading-investment-tools/eikon-trading-software/market-analysis-content-features.html

Tirole, J. (1988). *The theory of industrial organization.* Cambridge, MA: The MIT Press.

United Nations Development Programme. (2016). *Human Development Report 2016.* Retrieved from http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf

Walker, G., Madsen, T. L., & Carini, G. (2002), How does institutional change affect heterogeneity among firms? *Strategic Management Journal, 23*(2), 89-104. doi: https://doi.org/10.1002/smj.216

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic management journal*, *5*(2), 171-180. doi: http://dx.doi.org/10.1002/smj.4250050207
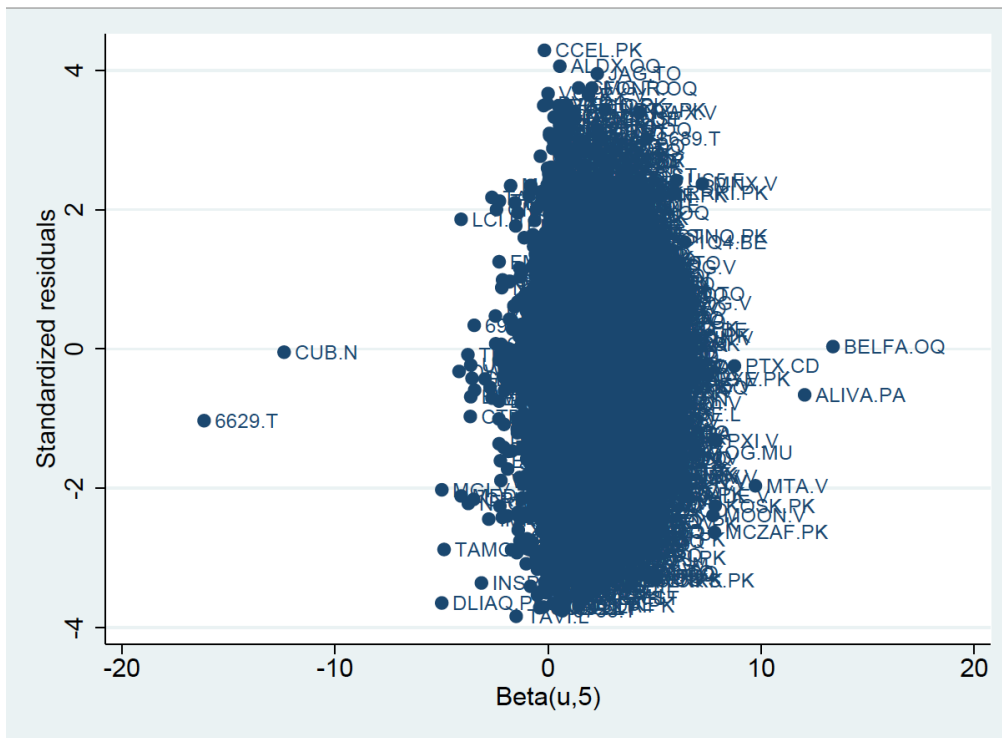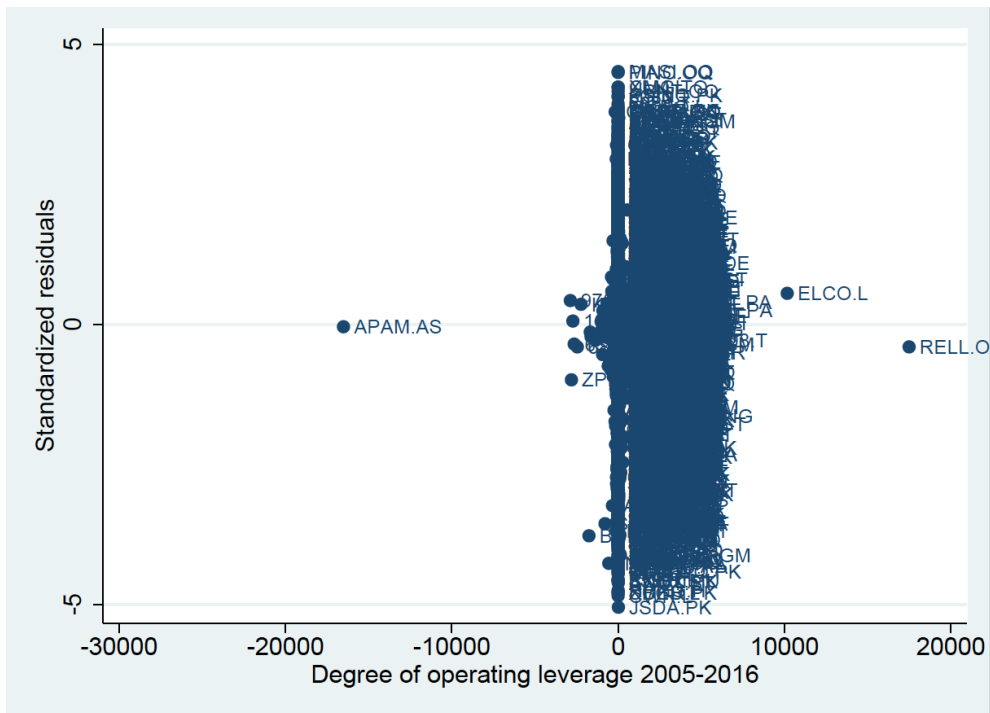
Woltman, H., Feldstain, A., MacKay, J. C., & Rocchi, M. (2012). An introduction to hierarchical linear modeling. *Tutorials in quantitative methods for psychology*, *8*(1), 52-69. doi: 10.20982/tqmp.08.1.p052

Appendix
Appendix 1 – Linearity

Appendix 2 – Outliers

Coefficients for degree of operating leverage and unlevered beta with and without outliers:

|	All years (2005-2016)			Recovery (2012-2016)		
	With outliers	Without outliers	Difference	With outliers	Without outliers	Difference
Degree of operating leverage	4,44E-07	4,27E-07	1,7E-08	-3,37E-07	-1,82E-05	1,79E-05
Unlevered beta	-	-	-	- 0,0093	-0,0112	0,0019

Appendix 3 – Heteroscedasticity

```
. reg res2_05_16 betau5 o_l_05_16 beta_u2 o_l_05_16_power2 int_betau_ol int_betau5_bu2 int_betau5_ol2 int_ol_
> beta_u2 int_ol_ol2
```

Source	SS	df	MS
Model	1885598.63	9	209510.959
Residual	1.3684e+10	10,048	1361895.87
Total	1.3686e+10	10,057	1360864.6

Number of obs	=	10,058
F(9, 10048)	=	0.15
Prob > F	=	0.9979
R-squared	=	0.0001
Adj R-squared	=	-0.0008
Root MSE	=	1167

res2_05_16	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
betau5	-20.11212	17.39929	-1.16	0.248	-54.21821	13.99397
o_l_05_16	.017306	.1296267	0.13	0.894	-.2367882	.2714002
beta_u2	.7931759	2.725977	0.29	0.771	-4.550284	6.136636
o_l_05_16_power2	-3.29e-06	.0000203	-0.16	0.871	-.0000431	.0000365
int_betau_ol	-.0355251	.1893599	-0.19	0.851	-.4067084	.3356582
int_betau5_bu2	.1824298	.2807847	0.65	0.516	-.3679643	.732824
int_betau5_ol2	2.62e-06	.0000148	0.18	0.859	-.0000264	.0000316
int_ol_beta_u2	.0138654	.082568	0.17	0.867	-.1479843	.1757152
int_ol_ol2	7.07e-11	6.98e-10	0.10	0.919	-1.30e-09	1.44e-09
_cons	31.68997	15.70177	2.02	0.044	.9113646	62.46858

.

Test statistic = n*R-sq = 10,058 * 0,0001 = 1.0058

Critical value Chi-sq (df = 10 parameters – 1 = 9) = 16.919

No indication of heteroscedasticity.
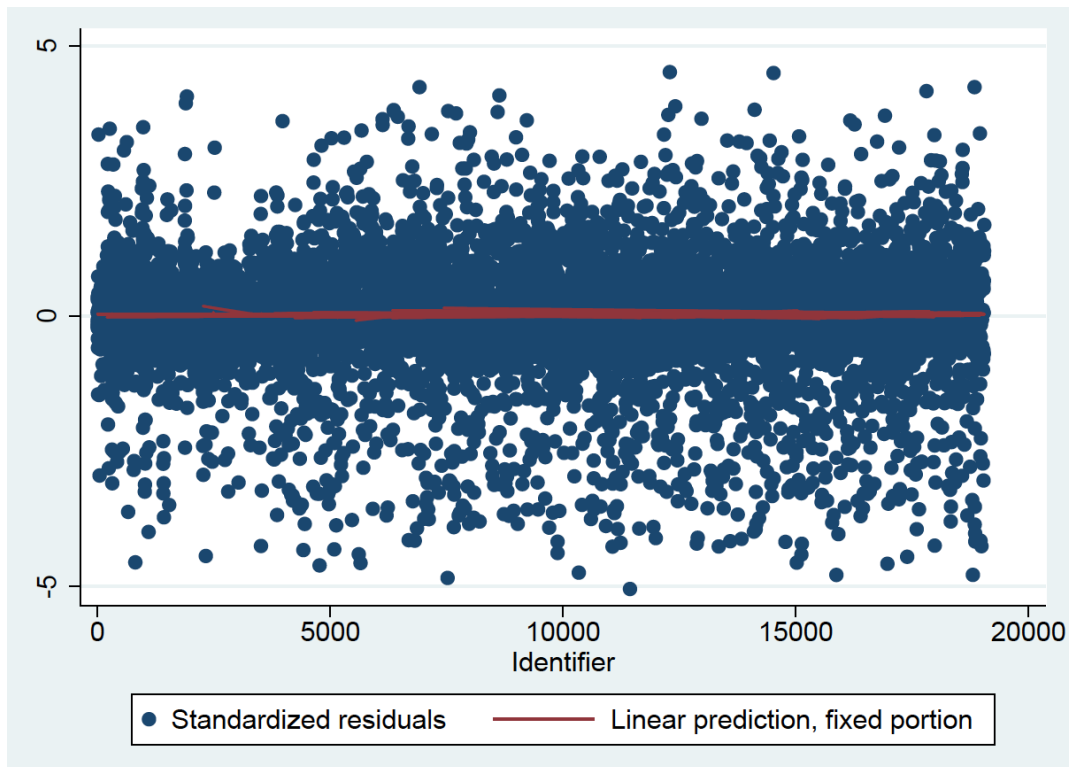
Appendix 4 – Normal distribution

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.0086
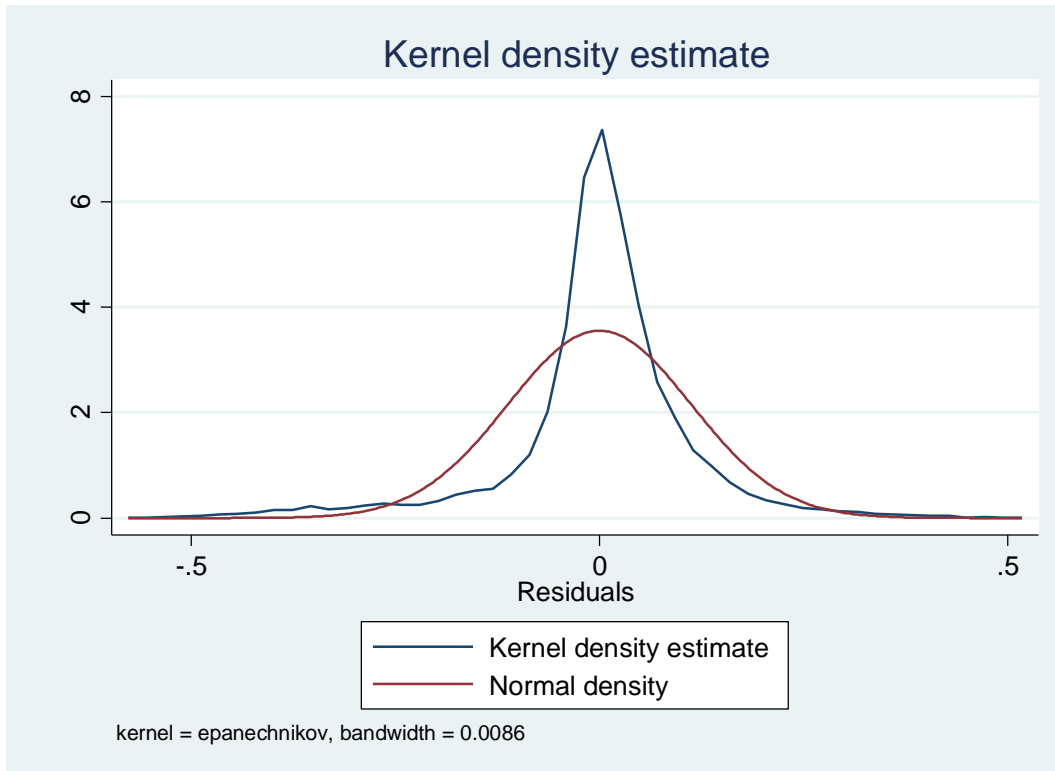
```
. tabstat res_05_16 if mean_roc_05_16 <= 0.5 & mean_roc_05_16>= -0.5, stat (mean sd skew kurt)
```

variable	mean	sd	skewness	kurtosis
res_05_16	-3.53e-11	.1121662	-.8034173	7.198546

Appendix 5 – Multicollinearity

Correlation 2005-2016:

	Degree of operating leverage (2005-2016)	Mean ROIC (2005-2016)
Degree of operating leverage (2005-2016)	1,0000	
Mean ROIC (2005-2016)	-0,0002	1,0000

Correlation 2012-2016:

	Degree of operating leverage (2012-2016)	Unlevered beta (2012-2016)	Mean ROIC (2012-2016)
Degree of operating leverage (2012-2016)	1,0000		
Unlevered beta (2012-2016)	-0,0086	1,0000	
Mean ROIC (2012-2016)	0,0003	-0,0448	1,0000