IMPACT OF FIRM-LEVEL FACTORS ON PROFITABILITY OF COMPANIES IN KENYA.

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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Abstract

This research evaluates the impact of firm-level factors on the performance of companies. These firm-level factors are examined as a set of determinants within business that explain profitability. The study thus adopts a quantitative approach based on a longitudinal study of publicly quoted companies in Kenya within each industry, for a period from 2004 to 2014, to determine how firm-level factors such as size, diversification, leverage, expense and growth impact a company's profitability, using ROA as a profitability measure. The study finds that leverage, firm size and expense ratios had the most significant impact in explaining profitability of listed Kenyan companies, their changes also contributed significantly to firm profitability changes across industries. Also, most of firm heterogeneity was found to exist among firms in the manufacturing and banking industries.

Key words: firm-level factors, firm resources, profitability, firm performance

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List of Abbreviations

GDP – Gross Domestic Product

NSE – Nairobi Stock Exchange

RE – Retained Earnings

ROA – Return on Asset

ROE – Return on Equity

SBU – Strategic Business Unit

SCP – Structure Conduct Performance model

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Chapter One: Introduction

1.1 Background of study

1.1.1 Profitability of firms

Profitability refers to the returns a firm can generate with whatever resources the firm has. The eventual goal for any organization is maximizing its profitability. At the microeconomic level, performance is a result of managing efficiently various economic resources within operational, investment and financing activities. Niresh and Velnampy (2014) state that in order for the organization to run on a long term performance in an industry it needs to develop, implement and maintain strategies and coherent policies which can only be achieved through a good knowledge of internal and external specific conditions in which it operates.

Profitability is also defined as the earning of the firm or consistency of cash inflows of the firm Kouser, Bano, & Azeem(2012) state that these consistency of cash flows may be affected by factors within the firm's environment, these factors that we described as firm-specific are its size, diversification, leverage, expense and growth which can impact its profitability if adequately effected. Differences in these firm characteristics may cause changes in the performance of the firm and the firm would not be able to reap the benefits associated with increased performance.

The financial performance of a corporation is of vital interest to many different groups and individuals. Lenders are concerned with the corporation's ability to repay loans as well as whether it is abiding by loan contracts. Purchasing agents for other companies are concerned with its viability as a supplier of goods or services for its products. Potential investors are interested in determining the financial strength of a company as an element in assessing the company's value.

1.1.2 Inter-firm profitability difference

Stierwald (2010) states that firm profitability differs widely across firms and industry. Empirical studies, such as Burja (2011) and Coate (1983), provide evidence for heterogeneity in firm performance and, for a broad range of industries and time periods. Overall, there is consensus that heterogeneity in firm performance is linked to factors at both the firm and industry level. Disparity exists, however, about the relative importance of both these influence.

A great number of theories (SCP, organization, competencies, technological) tried to explain the reasons why some firms are more profitable than others, and numerous studies have investigated different variables that may influence firm performance. Jonsson (2007) states that the hypothesis in industrial economics is that any temporary divergence of a firm's profit rate from the market average is rapidly corrected through the effects of potential or actual entry and exit or other competitive forces so that no firm can earn an above-average profit for a long period of time. Empirical evidence on the strength and duration of persistent above-average profit suggests there are differences between firms in long-run equilibrium rates of profit is influenced by both industry-level and firm-level factors such as size, market share, gearing and liquidity. Lansink & Silva (2001) in their study find that these differences between firms may be due to several reasons such as input quality differences (e.g., managerial capability, experience) or differences in the adoption rate of innovations across firms.

1.1.3 Private sector performance

As Moore (1990), discussing on strategic planning, stated that firms in the business environment through their performance can impact the macroeconomic environment as well and consequently the performance of the economy. In the Kenyan economy the private sector is well developed and large by sub-Saharan and regional standards and plays the leading role. The health of the economy and benefits to citizens are directly correlated to health of the private sector. The private sector is well diversified between primary, secondary and tertiary activities. Agriculture, manufacturing, trade, tourism, transport and communication, and financial services account for over 80% of the private sector's contribution to total GDP. The private sector is structurally exposed to shocks – tourism demand shocks, agriculture to supply shocks, and the whole economy to import inflation, especially from fuel imports. However the private sector is growing though on balance does not reach its full potential (African Development Bank, March 2014).

In line with the governments Vision 2030 economic development plan to transform Kenya into a middle-income country and the bid to spur economic growth and employment, it would be necessary to examine factors unique to the industry and the firms that may affect short term or long term performance. The government's goal is for manufacturing to account for 20% of GDP by 2030, nearly twice today's level. Diversification of exports away from agricultural

commodities and increasing value-added processing will have an impact on the nature of business in the manufacturing industry (Oxford Business Group, 2014).

The degree of costs with an industry and effective measures to minimize costs can see a firm achieve better performance. A recent study estimated that energy costs account for 40% of manufacturing production costs in Kenya. Sold at a rate of $0.15 per KWh, energy is more than twice as expensive in Kenya as China's $0.07 and almost four times as expensive as the $0.04 charged in South Africa and Ethiopia. To address this, the government has announced plans to implement new energy efficiency standards and increase capacity by 5000 MW over the next three years (Oxford Business Group, 2014).

The African Development Bank (2014) report on the private sector of Kenya makes a number of recommendations are made for developing the private sector further and faster. It suggests that the government, development partners and the private sector it should be involved in understanding and supporting MSEs and the informal sector, improve the business and investment climate and supporting the sector growth and competitiveness.

Kenya's performance on a number of global indices, however, indicates that the business environment is still regarded as poor in comparative terms. The most commonly cited challenges in the business climate are the cost and reliability of energy, a poor logistics system, including physical infrastructure and processes, a perception of corruption and the burden of inefficiencies (African Development Bank, March 2014).

1.2 Problem statement

The issue of whether industry functioning and firm's allocation of its resources has a significant bearing on its performance, the performance of the sector and the economy as a whole, both now and in the future, places significant interest in identification of determinants of profitability. With most companies targeting sustainable business and profitable growth, it is becoming a concern for managers to consider the relevant options that will bring forth the desired results.

Burja (2011) while studying factors influencing profitability states that in order a company to run on a long-term performance way, it is needed to develop, implement and maintain the strategies, measures and coherent policies from economic and financial point of view, resulting from a good knowing of internal and external specific conditions in which the firm acts. The qualities of managerial options depend by the ability of identifying those elements that productively used could lead to increasing of the results and performance.

It is becoming more and more necessary to understand what drives firm profitability, in order for good investment and management decisions to be made. Creating an emphasis on innovation, entrepreneurship and effectiveness in business will be important is driving the business to desired economic performance. The study thus sought to find out empirically the factors that affect the performance of a company.

1.3 Research objectives

- To determine the impact of the firm-level factors on the profitability of companies in Kenya.
- To determine the impact of changes in the firm-level factors on profitability.

1.4 Research questions

The research was guided by the following questions:

i. How is profitability impacted by these factors?

ii. To what extent is profitability affected by changes in these factors?

1.5 Significance of research

Management: The study may help managers to identify the factors that significantly play a role the profitability of the company and how such factors would threaten the business and consequently set up risk management policies and effective strategies designed to evade the threats and maximize their profits. Also, policies within the organization can be properly formulated and implemented where the cause and effect relationship between profitability and its determinant can be established. Effective policy making is an essential element in a vibrant economy and organizations as well. Thus the study could help come up with appropriate business and competitiveness policies.

Other Stakeholder and Investors: The study would be of importance to prospective investors whose investment may be jeopardized by the poor performance of the organization. Fundamental profitability analysis is objective and a true indication of how a company is performing. Stock prices, on the other hand, are subject to speculative swings, it thus would be necessary for individuals to understand what drives firm profitability so that they may recognize these factors and make good investment decisions. It will also be of importance to investor and stakeholder's expectations about targeted performance.

Researchers and entrepreneurs: The study is expected to increase the pool of knowledge by providing information on the industry and firm-specific factors impact profitability of companies. Further it will highlight and add relevant issues on the relationship between profitability and its determinants. Future entrepreneurs will also benefit from the study as they will be made aware on which factors to consider in industry and firm-based decisions that would be relevant to their start-up.

Chapter Two: Literature Review

2.1 Introduction

This chapter provides a review the literature that has been done in the area of study. It contains the theoretical literature on profitability, the empirical studies on the factors impacting profitability and how they relate. As such, it provides a suitable position to know the knowledge gap existing from literature pertaining to profitability and its determinants at the firm and industry level.

2.2 Theoretical review

Theories of the firm try to explain why there are differences in the organization and performance among different firms.

2.2.1 Structure-conduct performance

The structure-conduct-performance (SCP) model postulates that an exogenously given market structure determines firm behavior and performance. The structure of an industry refers to the factors such as technology, concentration, and market conditions. Conduct refers to how individual firms behave in the market; it involves pricing decisions (such as interest rate, commission and fees), advertising decisions, and decisions to invest in research and development, among other factors. Performance refers to the resulting profits and social welfare that arise in the market. The Structure Conduct Performance (SCP) paradigm views these three aspects of the industry as being integrally related and asserts that the market structure causes firms to behave in a certain way. In turn, this behaviour causes resources to be allocated in certain ways leading to either an efficient or inefficient market (Becker-Blease & Baumann, 2010).

The Structure Conduct Performance (SCP) model therefore asserts that factors external to the organizations such as market conditions are primarily and indirectly, the determinants of profitability. This model however fails to recognize that performance can impact on structure and conduct while structure can impact on both performance and conducts. Hansen & Wernerfelt (1989) mentions that the major determinants of firm-level profitability include: characteristics of the industry in which the firm competes; the firm's position relative to its competitors; and the quality or quantity of the firm's resources.

2.2.2 Firm effects theory

The firm effects model emphasizes that fundamental differences in firm-level characteristic exist, persist and cause differences in profitability between firms. Becker-Blease et al (2010) assert that the firm is a collection of competencies that allow it to earn more than its opportunity cost of capital. These competencies of the firm can include superior production technologies, superior marketing skills and superior research and development skills. The important point is that one or more of these competencies permit the firm to remain competitive and earn more than an adequate return. But, in order for the firm to protect its position, it must make sure other companies do not acquire its superior competencies. This emphasizes the organization theories of strategy and effectiveness in promoting superior performance of the firm.

Technological theories can also be describe under the firm effects since they are particular to the firm, they emphasize that physical capital and economies of scale and scope as factors that determine optimal firm size and, by implication, profitability. These theories focus on the production process and the investment in physical capital necessary to produce output, thus increasing economies of scale consequently reducing the average cost of production and increasing the return on capital invested.

Overall, evidence suggests that the SCP and firm effect models are plausible. This implies that firm and industry characteristics are important to determine profitability.

2.3 Empirical review

Demsetz (1973) studied industry structure and market rivalry. He found that superior firm performance can exist for some period of time. He states that although the industry structure may change because the superior firm grows, the resulting increase in profit cannot easily serve to guide competitors to similar success. The firm may have established a reputation or good will that is difficult to separate from the firm itself and which should be carried at higher value on its books he notes that firm's reputation, complex organizational structures, resource heterogeneity, factor immobility or uncertainty of investments are sources of superior firm performance.

Coate (1983) studied market share and firm profitability. He used a linear regression model to determine the effects of factors such as market share, diversification, geographic location, market share and market concentration on profitability of a sample of 123 large firms. He established

that the pursuit of the potential efficiencies in an industry can act to drive the competitive process and minimize the potential problem from concentration in the economy. He suggests that competition for the number-one spot in an industry makes it very difficult for the firms to collude. In his analysis he used after-tax return of sales as a measure of profitability. His other findings were the diversification measure has a significant positive effect on the profitability of the firm. This implies that diversified firms are more profitable than single-business firms, after controlling for diversification and efficiency advantage he found that overall size has a negative effect on profitability. The weighted industry growth rate also significantly raises the firm's profitability. This implies that growth increases the ability of a firm to earn disequilibrium profits in an industry. In his study all of these results are consistent with previous profitability studies.

Hansen and Wernerfelt (1989) in their study of determinants of firm performance, integrated two sample models of firm performance, one from the economic paradigm and one from the organizational paradigm. The economic model is based primarily on economic tradition, emphasizing the importance of external market factors in determining firm success the organizational model, built on the behavioral and sociological paradigm, sees organizational factors and their fit with the environment as the major determinants of success. The results of their study confirmed the importance and independence of both sets of factors in explaining performance. However, the results also indicated that organizational factors explain about twice as much variance in firm profit rates as economic factors.

Roquebert, Phillips, & Westfall (1996) in their study as anticipated found the dominant presence of SBU effects and corporate effect. To be sure, their findings provide additional evidence that strategic management theory has an important role to play, as certainly even corporate managers in the general case might have a significant impact on SBU profitability. They suggested that the variance component results on the recent data base should provide strong support for the study and theory development of strategic management concepts. Their combined variance accountability of corporate and SBU effects was 55 percent. They established that corporate effects may range from approximately zero to about 20 percent of the variance in SBU ROA, Depending on(among other things)the diversification of the corporation-the greater the diversification, the less the corporate effect. They found that SBU ROA is the appropriate unit of analysis in lieu of industry averages, the impact of industry effects on SBU ROA can only

account for about 10 percent of the variance, that SBU ROA do not greatly differ by size, and heterogeneity in the industry.

Feeny (2000) in his investigation of determinant of profitability Australian tax entities found that variables used to proxy industry characteristics such as concentration and barriers to entry explained little of the variation in entity profitability, on average 6%. He found a negative relationship between entity profitability and gearing. A positive association between capital intensity and profitability was reported in his study. Entity size also had a positive and significant relationship with profitability. A u-shaped relationship between market share and entity profitability was investigated.

Claver, Molina and Tari (2002) studied the firm effects and industry effect on profitability level of non-diversified manufacturing companies in Spain using data of (1994-1998). They used ROA as a dependent variable. The results of their study give empirical support for the development of the resource-based view since they found that firm effect's dominance over any other effect is clear. In their study they established the relative importance of firm and industry effect in explaining ROA may vary according to different industry definition and firm size. Firm effect is larger than industry effect for every firm size, however, their results reveal a more significant industry effect for large- and medium-sized firms than for small companies. In their study they checked that indeed diversity exists among firms in the same industry. The advantage of using ROA in their study of industry and firm effects of non-diversified manufacturing firms is that the profitability of the firms is looked at from the view of operating assets held by the manufacturing firms. The use of ROA would have been limited if the sample used were diversified firms.

Becker-Blease et al (2010) in their research examined the relation between firm size and profitability within 109 SIC four-digit manufacturing industries. Depending on their measure of profitability, we found that profitability increases at a decreasing rate and eventually declines in up to 47 of our industries. No relation between profitability and size was found in up to 52 of our industries. These two categories account for 97 of our 109 industries. Profitability continued to increase as firms become larger in up to 11 industries. Hence, the relation between size and profitability was found to be industry specific. But, regardless of the shape of the size

profitability function, they found that profitability is negatively correlated with the number of employees for firms of a given size measured in terms of total assets and sales. There is similarity in finding about the relationship between size and profitability, as Claver et al (2002) who found out that there exists significant industry effect for large- and medium-sized firms than for small companies

Stierwald (2010) investigated firm profitability and its determinant using multi-level modeling, the study decomposed unobserved profit heterogeneity into firm and industry effects and quantified their relative contribution. The determinants of profitability are firm size, productivity, age and financial risk. A particular aspect of the analysis was to examine the influence of productivity on profitability. Therefore, the model included measures of productivity, tested for variation in the relationship across firms and attempted to explain its properties. A sample of large Australian firms for the period 1995-2005 was used in the analysis. The estimation results indicated that almost two thirds of the variation in firm profitability can be explained by differences across firms, and that industry effects are of much smaller magnitude. Industry concentration was found to have a positive but statistically not significant impact. His findings are similar to Claver (2005) study that confirmed existence of diversity among firms with firm effects being larger than industry effect. He states that the findings, high firm effect than sector-wide effect have an implication for welfare analysis because as described by the firm effects model high firm profitability is the result of the competitive processes and not market failure.

Raza, Farooq and Khan (2011) in their study on firm and industry effects of profitability of listed Pakistani firms; ROA and ROE was taken as profitability measure and their dependency has checked with firm effect, industry effect and market share. The data used was extracted from financial statement analysis of Joint Stock Companies Listed on the Karachi Stock Exchange. Using regression analysis technique where firm profit represented firm effect and industry profit representing industry effects as independent variables, they established that firm effect, industry effect and market share are significant with ROA and ROE. They identify that both internal and external strategies are equally important for the firm for the survival of the firm and external strategies to gain competitive advantage respectively.

Burja (2011) did an empirical study of the correlations between different impact factors and profitability. She uses information taken from the annual financial reports of a company in the Romanian chemical industry for the period 1999-2009 and by using appropriate regression techniques. Return on total assets was used as an independent variable to determine the economic performance of the company throughout the years. Economic performance was reflected by a combination of elements that explain and influence the evolution of companies' return, such as: the financial result, the advantageous use of the financing structure, the size of the technical and productive infrastructure and the efficiency of current assets. The results of the study show a strong dependent relationship between company performance and how the available resources are managed. This is similar to Raza, Farooq and Khan (2011) study that use ROA to determine firm effect and industry effects and established that internal and external factors are important in determining its performance.

2.4 Research gap

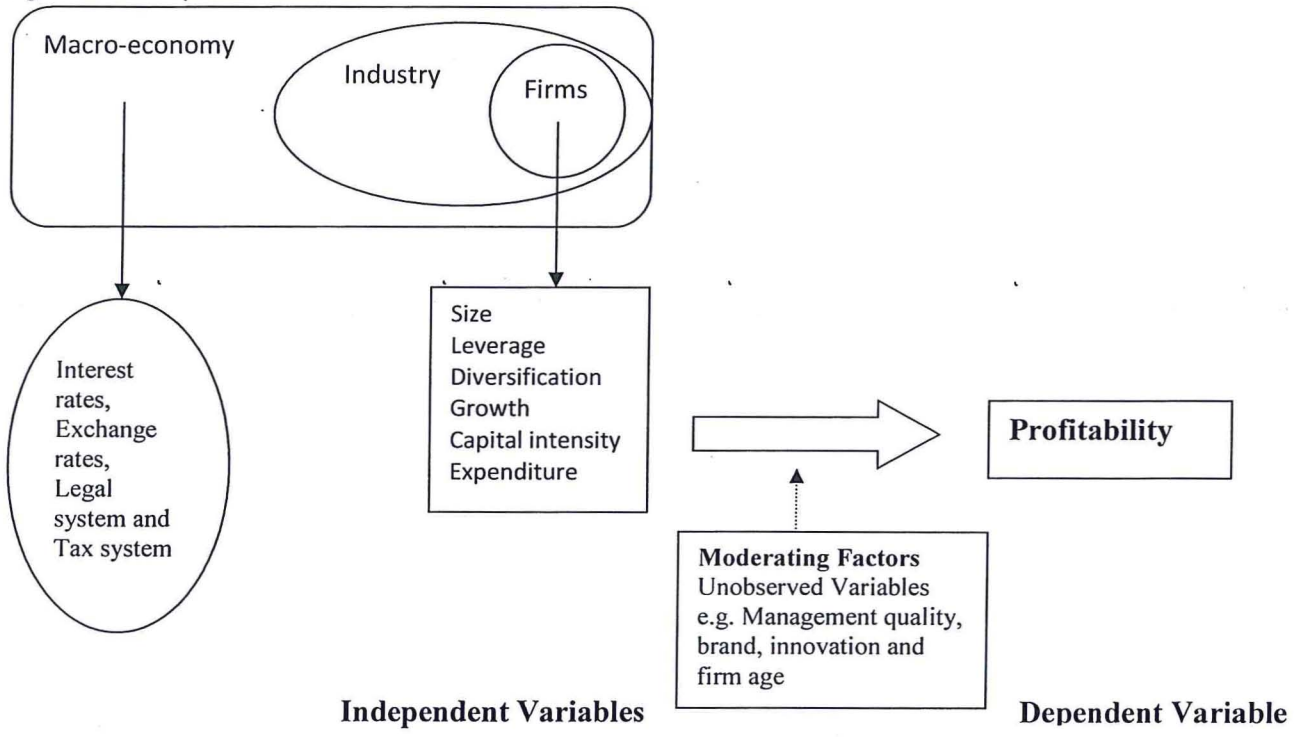
The literature reviewed reveals that firms are affected by various factors. There is considerable amount of work done by research to explain inter-firm profitability differences, however firm-level factors in particular have not been studied on their own as core determinants of profitability thus a more focused study of the firm profitability attributable specifically to the firm-level factors is required.

There exists a knowledge gap on how to account for unobserved firm-level factors which could be organizational factors that could be of essence in explaining profitability. Thus a way of solving for the exclusion of unobserved firm-specific variables from previous models would be important to account for management, core business practices and strategic outlook in explaining the profitability differences. This has not been provided by previous literature in the area.

The changes of these factors and their influence on profitability have not been touched on in the reviewed literature. The implication of short term changes in profitability determinants is an interest in the research area because it guides strategy formulation and implantation in organizations. It is from the above identified gaps that the research seeks to determine the factors specific to the firm that affect its profitability with evidence from listed companies in the Nairobi Stock Exchange in Kenya.

2.5Conceptual Framework

Figure 1: Conceptual Framework



Source: Author

Chapter Three: Methodology

3.1 Introduction

This chapter outlines the general methodology used to conduct the study. It specifies the research design, target population, sampling design, data collection method and instruments, and data analysis of the study. The objective of this section is to provide insight into the study.

3.2 Research design

The study adopted a quantitative research design. A quantitative research design involves the collection of empirical data and applying modeling and analysis of data techniques. In the quantitative research design adopted methods to describe, test relationships described by theory and examine cause and effect relationships between the variables were used. Through the application of statistical analysis, it was possible to make objective deductions and explore relationship between the variables of listed firms across the different industries in the Nairobi Securities Exchange.

3.3 Data Description

3.3.1 Population and sampling

A population is the target group, from which the researcher wishes to take their sample from. The population in this study comprised of all the companies listed in the NSE. The sample selected consisted of the largest market capitalization companies in each industry represented in the NSE.

3.3.2 Data collection

Due to the nature of this study, the data to be used was secondary data. The data was obtained from annual financial statements of the companies. The financial statements are the main information sources that allow the quantitative analysis of how resources are used during the process of creating value and give a picture of the company's financial position and its performance. The duration was the period from 2004 to 2014, shorter where company achieved later listing on the NSE or where there was need to achieve a balanced panel data set for respective sectors.

3.4 Model Specification

The unobserved firm-specific effects also have an impact on profitability as well and should be accounted for or controlled as factors that would influence a firm's profitability in addition to the measurable observable factors. As found by Stierwald(2010) that unobserved heterogeneity existed between firms and firm effects was greater than sector-wide effect, which was similar to Claver et al (2005) study that suggested existence of diversity among firms.

Multilevel modeling as used by Stierwald (2010) is useful when the data is nested and the effects at each level need to be established. Thus, in his case the study was on the firm and industry effects.

The model is described as follows:

$$\pi_{ijt} = \beta' X_{ijt} + u_{ijt} \quad (1)$$

where π_{ijt} is the profit of firm i in industry j at time t, X_{ijt} represents the vector of the time-varying observable firm characteristics (such as size, leverage and diversification)and β' the corresponding vector parameters. Term u_{ijt} is a firm specific component which captures the possible unobserved heterogeneity in firm profitability. The explanatory variables x_{ijt} are intended to provide economic and business "causes and effects" that might help in describing more accurately causes of fluctuations in π_{it}.

The term u_{it} models unobserved firm-specific components. It is represented as an unobserved autoregressive component which follows a first-order auto-regression with $-1<\rho<1$.(Annacker & Hildebrandt, 2004)

$$u_{ijt} = \mu_{ij} + \rho u_{ij,t-1} + \varepsilon_{ijt} \quad (2)$$

Three types of variables are distinguished and represented by this firm-specific component u_{ijt}:

(1) Firm-specific variables which have a stable effect over the period of analysis, for example corporate culture or management quality/employee spirit/ business ethics/team and brand or image, are taken into account by the time-invariant variable μ_{ij}.

(2) Other variables whose influence is likewise persistent but dissipating over time (e.g. product innovations or technological know-how or core competencies, strategic dimension or dynamic efficiencies), are captured by the term $\rho u_{i,t-1}$.

(3) Finally, time variant stochastic shocks which lie outside of the firms control (e.g. luck, change in trends and preference or political and economic environment) whose effects last only one period (e.g., one year) are modeled by the serially uncorrelated stochastic disturbance ε_{it}. $v_t \sim NIID\ (0, \sigma_v^2)$

This auto-regression tries to captures many of the movements in profitability that are present and may explain the unobserved effects on profitability and the profitability inertia that exists within firms given other deterministic factors.

However the quantification of these unobserved variables is problematic. We will then the first difference of equation (1), which will give the final specification of the model that will be used in this research.

From equation (2), if $\rho=1$ then $\Delta u_{it} = \mu_i + \varepsilon_{it}$

Thus the first-difference regression equation becomes,

$$\Delta \boldsymbol{\pi}_{ijt} = \boldsymbol{\beta} \Delta \boldsymbol{X}_{ijt} + \boldsymbol{\varepsilon}_{it} \quad \textbf{(3)}$$

The final panel regression becomes,

$$\boldsymbol{\pi}_{ijt} = (\boldsymbol{\alpha} + \boldsymbol{\mu}_{ij}) + \boldsymbol{\beta} \mathbf{X}_{ijt} + \mathbf{u}_{ijt} \quad (4)$$

The equation (4) will aid in examining which firm-level factors are of significant impact on the profitability of a firm assuming company specific effects and the firm-level factors on its profitability. The equation (3) will aid in the control of unobserved firm-level factors and establishing the impact of change of factors on profitability.

3.4.1 Variables definition and measurement

Stierwald (2010), Coate (1983), Feeny (2000) and Burja (2011) used some of these variables in the analyses of firm profitability.

Table 1: Variables description

Variables	Description
Dependent variables	
ROA	Economic profit, measures profitable a company's assets are in generating revenue. $$ROA = \frac{Net\ Income}{Average\ Total\ Assets}$$
ROE	Financial profit, measures how profitable a company is to the ownership interest. $$ROE = \frac{Net\ Income}{Shareholder\ Equity}$$
Independent variables	
Size	It will capture firm resources. Measured by Logarithm of Total Assets.
Leverage	It captures the financial structure of the organization. $$Leverage = \frac{Total\ liabilities}{Total\ Assets}$$
Firm growth	SGR tells us that how much growth a company can achieve without external financing in business i.e. growth achieved through internal sources. $$\text{Sustainable growth rate} = \frac{\text{Retained Earnings}}{\text{Net income}} \times ROE$$
Diversification	Measures diversification of the company. $$Diversification\ ratio = \frac{Other\ income}{Total\ income}$$
Capital intensity	Describes the capital intensiveness of the industry. $$Fixed\ Asset\ Ratio = \frac{Fixed\ Assets}{Total\ Assets}$$
Expense-revenue Ratio	Connects expenses with revenue, and expresses the efficiency achieved by a company through minimize its costs. $$Expense - revenue\ ratio = \frac{Operating\ costs}{Operating\ income}$$

Source: Author

3.4.2 Assumption of the study

In this study the following assumptions were made:

- For a profit maximizing firm, the factors that affect the firm consequentially affect the profitability. Thus all factors identified are taken up from a profitability view.
- It was also assumed in the study that macroeconomic factors affect the specific industry as a whole and the firms in the industry in the same way.
- Political and industry factors were not considered to impact firm profitability.

Chapter Four: Results and Discussion

4.1 Introduction

This chapter gives descriptive statistics of the collected data, its analysis and implication of the results found from the study. Listed companies in the insurance, manufacturing, banking, construction, petroleum & energy, agriculture and media services industry were used.

4.2 Descriptive Statistics

Overall variation in the panel data set derives from two sources: One is the heterogeneity of the averages between companies, described as 'between-unit' variance and the second is the yearly heterogeneity of a variable over time for each company, described as the 'within-unit variance'. Overall means of the variables relate to the mean of all the companies in the sample.

A company's mean of variable (unit-specific mean) is described by: $\bar{y} = \sum_{t=1}^{T} \frac{y_{it}}{T}$ and the overall arithmetic mean as, $\bar{\bar{y}} = \sum_{i=1}^{n} \sum_{t=1}^{T} \frac{y_{it}}{n \cdot T}$. The variances were computed as $var(between) = \widehat{\sigma_u^2} = \frac{\sum_{i=1}^{n} (\bar{y} - \bar{\bar{y}})^2}{n-1}$ and the $var(within) = \widehat{\sigma_e^2} = \frac{\sum_{i=1}^{n} \sum_{t=1}^{T} (y_{it} - \bar{y})^2}{n \cdot (T-1)}$.

4.2.1 Descriptive statistics discussion

From the table 2a and 2b below of summary statistics of the collected data; Generally, firms within the NSE are big companies, given the measure of size and had averagely little variation in this size measure. This could be owed to the capital and asset requirements for listing by the capital markets authority.

In terms of size, manufacturing sector had highest between-variances of size, meaning there was a greater difference in sizes of companies in the manufacturing sector. The lowest between-variance of size, was in construction sector meaning that these companies were of rather similarly sized. The banking sector was evidenced by highest within variances of size, this is as expected since there are greater yearly shifts in banks asset depending its performance in loan issuance.

For fixed assets, companies in the insurance sector had the lowest fixed asset ratio; companies in construction, manufacturing and energy sectors had the highest fixed asset ratio. This is so as companies in insurance are more contract-oriented and manufacturing are machinery inputs oriented.

Looking at leverage, companies in the banking sector had the highest leverage ratios; this would be expected since banks have more liabilities in terms of deposits held. Companies in the agricultural sector had the highest average of sustainable growth rate, ratio of retained earnings to total equity, followed by those in manufacturing ; the companies in these two sectors also had lowest leverage indicating that they sought low amounts of external funding during the decade compared to those in other sectors.

In terms of diversification, insurance companies had the highest diversification of 27%, with low between variance of 0.044 indicating that companies in the insurance sector are generally well diversified. These companies also displayed highest expenses to revenue ratios, indicating that insurance companies incurred more expenses than other companies from other sectors within the past decade; explaining their higher level of diversification. Manufacturing companies had lowest expenses to revenue.

Banks displayed the highest return on equity but the lowest return on assets. This is because of the higher leverage that they had during the decade, making the divisor (equity) for smaller for the given level of total assets. For the purpose of this research this inconsistency of the two ratios would be problematic in determining profitability. Thus only ROA was used as dependent variable in subsequent regressions.

Table 2a: Summary statistics for insurance, manufacturing and banking industries

	Sector	Insurance		Manufacturing		Banking	
	Obs[1]	n = 3	T = 11	n = 5	T = 12	n = 8	T = 12
Variable		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
roe	overall	0.1963	0.1046	0.1941	0.2233	0.2039	0.0758
	between		0.0490		0.1806		0.0581
	within		0.0964		0.1527		0.0526
roa	overall	0.0551	0.0296	0.1136	0.0843	0.0293	0.0114
	between		0.0245		0.0730		0.0086
	within		0.0216		0.0526		0.0080
logta	overall	23.4479	0.7533	22.4828	1.2939	22.7827	1.0063
	between		0.5531		1.3813		0.5494
	within		0.5976		0.3492		0.8635
far	overall	0.0061	0.0051	0.4564	0.1423	0.0240	0.0148
	between		0.0032		0.1307		0.0096
	within		0.0044		0.0798		0.0118
lev	overall	0.6818	0.1830	0.3333	0.1634	0.8365	0.1270
	between		0.2114		0.1286		0.0666
	within		0.0527		0.1150		0.1105
sgr	overall	0.5603	0.1864	0.6326	0.4311	0.4972	0.1718
	between		0.1382		0.2278		0.1285
	within		0.1470		0.3789		0.1221
divratio	overall	0.2687	0.0878	0.1175	0.1000	0.1794	0.1722
	between		0.0440		0.0490		0.1536
	within		0.0798		0.0897		0.0939
err	overall	1.1473	0.1777	0.7932	0.1860	0.9840	0.4182
	between		0.1900		0.1819		0.3508
	within		0.0822		0.0877		0.2570

Source: Computation

Table 2b: *Summary statistics for construction, energy, agriculture and media industries*

	Sector	Construction		Petroleum & Energy		Agriculture		Media Services	
	Obs	n = 3	T = 11	n = 4	T = 9	n = 3	T = 7	n = 3	T = 5
Variable		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
roe	overall	0.1543	0.1087	0.0598	0.1881	0.1358	0.0868	0.1882	0.0971
	between		0.0664		0.0350		0.0589		0.1052
	within		0.0937		0.1856		0.0715		0.0390
roa	overall	0.0796	0.0627	0.0265	0.0416	0.0934	0.0587	0.1165	0.0759
	between		0.0585		0.0066		0.0389		0.0874
	within		0.0398		0.0412		0.0489		0.0176
logta	overall	23.3846	0.7638	24.6932	0.8796	22.1181	0.6678	22.6958	0.5145
	between		0.5400		0.8594		0.7507		0.5750
	within		0.6187		0.4515		0.2270		0.1690
far	overall	0.6210	0.1121	0.4658	0.2960	0.2549	0.0903	0.2688	0.2234
	between		0.0911		0.3299		0.0695		0.2633
	within		0.0829		0.0606		0.0692		0.0194
lev	overall	0.5282	0.1718	0.6352	0.1400	0.2971	0.0710	0.4619	0.1763
	between		0.1909		0.0991		0.0283		0.0355
	within		0.0668		0.1097		0.0670		0.1737
sgr	overall	0.5247	0.1669	0.4512	0.2453	0.8183	0.0825	0.5353	0.2695
	between		0.0703		0.1903		0.0601		0.2739
	within		0.1564		0.1795		0.0655		0.1381
divratio	overall	0.0432	0.0350	0.0982	0.0740	0.1128	0.1042	0.0356	0.0170
	between		0.0137		0.0434		0.0792		0.0106
	within		0.0331		0.0634		0.0804		0.0144
err	overall	0.8671	0.0946	0.9668	0.1545	0.8894	0.0835	0.8817	0.0920
	between		0.0936		0.1671		0.0502		0.1047
	within		0.0541		0.0481		0.0721		0.0253

Source: Computation

4.3 Specification Testing for Panel Regression Analysis

4.3.1 Test for appropriateness of panel methods vs. pooled ordinary least square

F-tests and LM test were carried out to establish the appropriateness of panel methods in regression estimation and possible presence or source of significant firm-specific or time-specific effects for the companies. The results are shown in table 3 below.

4.3.1.1 Specification tests for strict exogeneity and serial correlation in the idiosyncratic errors

Failure to reject the null hypothesis in LM Test for random effects and F-test for fixed effects indicate that the Gauss Markov assumptions hold, meaning there was no serial correlation of the error terms and the error terms are not correlated with the endogenous variables. Thus a pooled OLS regression would yield consistent and efficient estimators. The results of the F-test and LM test have been summarized in the table 3 below. We failed to reject the null hypothesis for the Breusch-Pagan LM test and F-test for time-fixed effect at a level of significance of 5% for firms in all the sectors. The F-test for individual specific effects rejects the null for the manufacturing and the banking sector, indicating that there exist significant individual specific differences between companies within these 2 sectors in the NSE.

Table 3: Summary of F-test and LM test results

	F-test for Ui =0	F-test	Breusch-Pagan LM test:
	Individual effects Ui=0	Time fixed effects =0	Var=0,cov(u,x)=0
Sector	Prob>F	Prob>F	Prob>chibar2
Insurance	0.1550	0.5816	1.0000
Manufacturing	0.0358*	0.9137	1.0000
Banking	0.0000*	0.4329	0.0000
Construction	0.1551	0.2311	1.0000
Petroleum	0.1836	0.5259	1.0000
Agriculture	0.3416	0.4659	1.0000
Media	0.5911	0.7885	1.0000

4.3.2 Controlling for unobserved heterogeneity within manufacturing and banking industry

The differenced equation (3) does not include the component u_i anymore. Thus, by computing a regression on the differenced data we get rid of the individual constant heterogeneity among the firms within the banking and manufacturing industries. This first-difference equation (3) was also useful answering the second research question of how changes in the firm level factors will affect profitability.

4.3 Regression Results

4.4.1 Test of significance and interpretation of coefficients

The variables selected explained well the variability in profits of companies in different sectors, with an averaged R-squared of 0.7132, lowest (0.1429) being evidenced in the petroleum & energy industry and highest (0.9849) in the media services industry.

The significance of the firm-level factors from the regression is established by checking whether its probability is below the level of significance of 5%. The impact of size (on average 3.5%) in explaining companies' profitability was found to be significant in the manufacturing, banking and agriculture industries. In these industries fixed assets (on average 17%) played a significant role in explaining profitability. Expenses here were negatively impacting profitability, highest (-0.69) in agriculture and lowest (-0.0147) in banking industry, which were also the only industries where the level of diversification explained the companies' profitability.

In the insurance, construction and media industries, leverage and expenses were found to have a significant and negative impact on the companies' profitability. The amount of retained earnings (sustainable growth rate) was significant for the construction industry (describing on average 11%; and 2% in banking). The results are shown in table 4 and table 4.1 below.

For the first difference regression, it was found that changes in expenses on average would possibly cause a 43% decrease in profitability if other factors were held constant, for manufacturing, construction, agriculture and banking(-0.0192) industries. Changes in leverage describe on average -0.3715 of the changes in profitability in the construction industry. These regression results are shown in table 5 below.

Table 4: Summary table of regression results for insurance, manufacturing and banking industries

Sector	Insurance		Manufacturing		Banking	
Variable	Coef.	P>t	Coef.	P>t	Coef.	P>t
ROA	(Std. Error)		(Std. Error)		(Std. Error)	
Size	0.0018	0.8050	0.0439	0.0000*	0.0059	0.0000*
	0.0071		0.0054		0.0007	
Fixed	-0.6896	0.4620	0.1621	0.0000*	0.2569	0.0000*
Assets	0.9236		0.0345		0.0496	
Leverage	-0.1808	0.0000*	-0.0990	0.1300	-0.0244	0.0000*
	0.0314		0.0643		0.0065	
RE growth	0.0170	0.4240	0.0109	0.4860	0.0393	0.0000*
	0.0209		0.0155		0.0055	
Diversification	0.0181	0.6540	0.0605	0.1710	0.0298	0.0000*
	0.0399		0.0436		0.0046	
Expenses	-0.0766	0.0300*	-0.3775	0.0000*	-0.0179	0.0000*
	0.0334		0.0381		0.0021	
_consant	0.0389	0.8210	-0.4817	0.0000*	-0.0951	0.0000*
	0.1698		0.1222		0.0160	
Model-fit	Obs	33	Obs	60	Obs	96
Statistics	F(6, 26)	10.7	F(6, 53)	63.63	F(6,89)	33.05
	Prob > F	0.0000	Prob > F	0.0000	Prob > F	0.0000
	R-sq	0.7118	R-sq	0.8781	R-sq	0.6902
	Adj R-sq	0.6453	Adj R-sq	0.8643	Adj R-sq	0.6693
	Root MSE	0.0177	Root MSE	0.0311	Root MSE	0.0065

Table 4.1: Summary table of regression results continued

Sector	Construction		Petroleum		Agriculture		Media service	
Variables	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
ROA	(Std. Err)		(Std. Err)		(Std. Err)		(Std. Err)	
Size	-0.0229	0.0840	-0.0195	0.3590	0.0556	0.0040*	0.0087	0.7370
	0.0127		0.0209		0.0161		0.0251	
Fixed	-0.0938	0.1430	0.0831	0.2700	0.2234	0.0280*	-0.0474	0.3250
Assets	0.0621		0.0739		0.0910		0.0452	
Leverage	-0.1579	0.0020*	0.0358	0.6430	0.0608	0.7160	-0.0610	0.0190*
	0.0458		0.0764		0.1637		0.0209	
RE	0.1110	0.0250*	0.0600	0.1320	0.1355	0.2970	0.0308	0.3790
growth	0.0467		0.0386		0.1251		0.0330	
Diversification	0.1676	0.5040	-0.0067	0.9530	0.3597	0.0050*	0.0864	0.7610
	0.2476		0.1125		0.1093		0.2750	
Expenses	-0.4283	0.0000*	0.0735	0.4430	-0.6945	0.0000*	-0.7179	0.0000*
	0.0979		0.0944		0.1239		0.0994	
_consant	1.0617	0.0040	0.3486	0.5060	1.7155	0.0020	0.5731	0.4110
	0.3370		0.5171		0.4400		0.6606	
Model-fit	Obs	33	Obs	36	Obs	21	Obs	15
statistics	F(6, 26)	18.38	F(6, 29)	0.81	F(6, 14)	9.47	F(6, 8)	86.71
	Prob > F	0.000	Prob > F	0.5736	Prob > F	0.0003	Prob > F	0.000
	R-sq	0.8092	R-sq	0.1429	R-sq	0.8022	R-sq	0.9849
	Adj R-sq	0.7652	Adj R-sq	-0.0344	Adj R-sq	0.7175	Adj R-sq	0.9735
	Root MSE	0.0304	Root MSE	0.0423	Root MSE	0.0312	RootMSE	0.0124

Table 5: Summary of regression of first differenced variables

	Insurance		Manufacturing		Banking	
Δroa	Coef.	P>t	Coef.	P>t	Coef.	P>t
Δlogta	-0.0186	0.4070	-0.0145	0.6740	0.0037	0.1590
Δfar	-2.7577	0.1180	-0.0978	0.2680	0.1535	0.0860
Δlev	0.0788	0.5410	-0.0210	0.8330	-0.0205	0.0920
Δsgr	0.0439	0.2620	0.0228	0.4060	0.0133	0.0610
Δdivratio	0.0644	0.3010	0.1067	0.0560	0.0446	0.0000*
Δerr	0.0878	0.0880	-0.4752	0.0000*	-0.0192	0.0000*
	Obs	30	Obs	55	Obs	88
	F(6, 24)	1.76	F(6, 49)	7.51	F(6, 82)	4.6
	Prob > F	0.1514	Prob > F	0	Prob > F	0.0005
	R-sq	0.305	R-sq	0.479	R-squared	0.2516

	Construction		Petroleum		Agriculture		Media services	
Δroa	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
Δlogta	0.0060	0.8760	0.0217	0.5810	-0.0535	0.5530	-0.0131	0.8250
Δfar	-0.1263	0.3490	-0.1060	0.5850	0.1364	0.5230	0.0402	0.8830
Δlev	-0.3715	0.0190*	-0.1019	0.3210	-0.1509	0.5430	-0.0458	0.1810
Δsgr	0.1596	0.0760	0.1826	0.0610	-0.1099	0.7800	-0.0324	0.5600
Δdivratio	0.3332	0.2270	0.0700	0.6620	0.2673	0.0510	-0.0127	0.9740
Δerr	-0.6101	0.0230*	-0.2048	0.3940	-0.6270	0.0040*	-0.6463	0.0440*
	Obs	30	Obs	32	Obs	18	Obs	12
	F(6, 24)	4.71	F(6, 26)	1.8	F(6,12)	2.94	F(6, 6)	1.74
	Prob > F	0.0027	Prob > F	0.1389	Prob > F	0.0528	Prob > F	0.258
	R-sq	0.5407	R-sq	0.2931	R-sq	0.5953	R-sq	0.6356

* Significant factor at 5% level of significance

4.5 Discussion of results

The F-tests and LM test on preference of pooled OLS to panel methods (fixed or random effects), show that on average the effect of the firm-level factors is similar across different time periods for companies in the different industries. However, there existed firm-specific heterogeneity among firms in the manufacturing and banking industries, evidenced by a rejection of the null hypothesis of individual effects.

Manufacturing and banking industries had firms that were found to be heterogeneous, this could be possibly because of the high level of competition and innovation or established brand factors or possible strong management influence within these two industries as compared to the others, that called for the firms to seek competitive advantage through efficient management and allocation of their resources, guiding us towards the importance of firm-level factors in explaining firms' profitability.

Petroleum industry companies profitability is not well explained by the firm-level factors described, indicating that possibly the determinants of profits in this industry is would be better explained by industry factors such as market share, concentration or competition or other factors not examined.

The significance of the factor of sustainable growth rate indicates that growth flows from the companies' profitability if measured by retained earnings. Previous company's performance will also impact the company's current level of growth, meaning that the profitability of a company can increase also through acceleration of own capital rotation, consequently contributing to value creation and profit.

Chapter Five: Conclusion and Recommendation

The objective of this paper was to find out how the profitability of companies listed in the NSE is affected by firm-level factors. These firm-level factors were described as those factors that are specific to the firm and its resource use and allocation. The measure of profitability used in the study was ROA. The firm-level factors that were found to be impactful in describing profitability across the different industries in the NSE were found to be expenses to revenues ratio that the companies maintained across the years, shedding light on the importance of effective management and sustainable structure of costs to achieve desired profitability for companies. The level of leverage had a negative impact on profitability of the companies in the sample, particularly those in insurance, construction and media services industry, supporting the hypothesis that indeed the capital structure can have an impact on the profitability and a trade-off between debt financing and self-financing through equity or retained earnings may need to be considered by management if they aim to achieve certain level of profitability.

Fixed assets and size played an important role in the manufacturing, agriculture and banking industries. Manufacturing and agriculture industries are production oriented industries and thus more plants and equipment means increased production and consequently increased profits. The banking industry fixed asset significance is through the extended need for banks to increase their market share and customer base, a significant amount of fixed assets may then be required to earn substantial profits in the industry. This finding, also supports the structure-conduct-performance theory, that the firm-level factors will have an influence on how companies performs (market share, concentration and profits) its particular industry.

The level of diversification was only found to be of influence in agriculture and banking industries, this would indicate that these industries are somewhat competitive and companies in them may need to significantly engage in diversification to achieve desired performance. This could also lead to the drawing of the conclusion that companies industries other than banking and agriculture, are performing well in their core businesses and thus level of diversification is not of impact.

The study can be extended to incorporate sector effects and how profitability is affected. Thus further research in the area should be to incorporate market factor or other industry specific or

geographical aspects, to establish conclusively which factors firm-level, market and industry or geographic play most significant role in explaining causes and extent of impact on profitability.

In conclusion, this study asserts that firms should be in pursuit of strategies which will lead to the acquisition of resources that can be identified as key success factors in the firm's environment as confirmed by the study's results which find a strong dependent relationship between the firms' performance and how the available resources are managed. It also finds as Stierwald (2010) that unobserved heterogeneity existed between firms, as well as Claver et al (2005) who asserted the existence of diversity among firms in their study of profitability of Spanish firms. This study was however limited by accounting practices, for example an increase fixed asset amounts was treated as an increase in fixed assets, which may not be necessarily the case as it may have been brought about by an increase in the fair value. Also, increase in equity does mean an increase in shareholder's funds but may be due to an increase in the revaluation reserves as provided for by IAS 16.

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