

**The Effect of Capital Budgeting Decisions on
Profitability: Selected Companies from Developed
and Developing Countries**

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ABSTRACT

The purpose of this study is to determine the impact of capital budgeting decisions on the profitability of listed companies in Germany, Canada, Jordan, and Egypt. Study population is 64 listed companies. The main independent variable is capital expenditure as measured by natural logarithm of fixed assets. In addition to this variable, study has leverage, liquidity and age of the company as control variables. As for dependent variable, profitability is used measured by return on assets. Secondary data was collected for a period of 9 years on an annual basis. The study employed a descriptive panel data analysis with OLS regression and random regression as robustness to analyze the association between the variables. Eviews 10 was used for analyzing the secondary data. ANOVA results show that the F statistic was significant at 5% level with a $p=0.000$. Therefore, the model was fit to explain the relationship between the selected variables. The study finds that capital expenditure affects financial performance significantly and positively in both developed and developing countries. In addition to this, control variables are also found to be significant and have signs as expected. However, the study also finds that, the magnitude of the impact of capital expenditure on performance is higher in developed countries relative to developing countries. This relatively lower impact may be explained by the fact that firms in developing economies have not adapted proper and effective project appraisal means for capital budgeting decision making. Based on the findings, the study puts forward some recommendations.

Keywords: Capital Budgeting, Profitability, Capital Expenditure

ÖZ

Bu çalışmanın amacı, sermaye bütçeleme kararlarının Almanya, Kanada, Ürdün ve Mısır'daki şirketlerin karlılığı üzerindeki etkisini belirlemek ve ölçmektir. Çalışmada borsada işlem gören 64 şirket incelenmiştir. Ana bağımsız değişken, sabit varlıklara yapılan harcamalarıdır. Bu değişkenler yanında çalışmanın kontrol değişkenleri olarak kaldıraç, likidite ve şirketin yaşı yer almaktadır. Bağımlı değişken için ise karlılığı gösteren varlık getirisi kullanılmıştır. İkincil veriler, 9 yıllık bir dönem için toplanmıştır. Analiz için tanımlayıcı veri analizi kullandı. Çalışmada, tanımlayıcı istatistikler analizi yanında, değişkenler arasındaki ilişkiyi analiz etmek için OLS regresyonu ve sağlamlık testi olarak rastgele regresyon kullanılmıştır. Verileri analiz etmek için Eviews kullanılmıştır. Anova testleri, F istatistiğinin% 5 düzeyinde $p = 0.000$ ile anlamlı olduğunu göstermektedir. Bu nedenle model, seçilen değişkenler arasındaki ilişkiyi açıklamaya uygundur. Çalışma, sermaye harcamalarının hem gelişmiş hem de gelişmekte olan ülkelerde finansal performansı önemli ve olumlu etkilediğini ortaya koymaktadır. Buna ek olarak, kontrol değişkenlerinin de anlamlı olduğu ve beklenen işaretlere sahip olduğu bulunmuştur. Bununla birlikte, çalışma aynı zamanda sermaye harcamalarının karlılık üzerindeki etkisi büyüklüğünün gelişmekte olan lkelerde gelişmiş olan ülkelere göre daha düşük olduğunu ortaya koymaktadır. Bu görece daha düşük etki, gelişmekte olan ekonomilerdeki firmaların sermaye bütçeleme kararları için uygun ve etkili proje değerlendirme araçlarını uyarlamamış olmasıyla açıklanabilir. Bulgulara dayanarak çalışma bazı öneriler ortaya koymuştur.

Anahtar Kelimeler: Sermaye Bütçelemesi, Karlılık, Sabit Sermaye Harcaması

DEDICATION

This work wholeheartedly dedicated to:

My beloved parents, who have been my source of inspiration and gave me strength,
who continually provide their spiritual, emotional, and financial support.

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LIST OF ABBREVIATION

ANOVA	Analysis of Variance
DCF	Discounted Cash Flow
IRR	Internal Rate of Return
OLS	Ordinary Least Squares
NPV	Net Present Value
RBV	The Resource-Based View
ROA	Return on Assets
ROI	Return on Investment

Chapter 1

INTRODUCTION

1.1 Background of the Study

Business companies are organized over a long period of time with the ultimate purpose for generating income. To accomplish its expected targets, the organization relies on the availability of financial resources, highly qualified labor, and technology. Management is the structure of the agency delegated by the owners or capital suppliers to supervise the company's every day running and make reasonable decisions that will increase the shareholders wealth. The options often vary from the purchase of additional properties and the recruiting of qualified human capital, the reorganization of the corporation due to advances in new technologies, the alteration of current assets or the acquisition of other market organizations, these practices include preparation, estimation and execution that must be aligned with the company's strategic planning. The planning process and resource allocation would boost the judgment on proper financial spending, thus the decisions on capital budgeting. If the decisions are fully executed, it is anticipated that the performance of the companies' will improve (Levy & Sarnat, 1994).

The study is embedded in real option theory which claims that managers face challenges in forecasting the businesses that are expected to provide stewardship over potential cash flows. Managers test projects using different methods including the discounted cash flow approach (DCF) and choose the best project that optimizes cash

flows. The traditional theory of capital budgeting was established by Woods & Randall (1989). Brealey and Myers (2003) established a basic rule that can be used by directors of the firms to make proper capital budget decisions, reinvest in all positive NPV projects, and reject projects with negative NPV. It was hypothesized that NPV criterion is used in capital budgeting to calculate the shareholder wealth, which exactly the essential aim of financial managers. The entire capital budgeting operations require several planning processes, the assessment of projects, appropriate method of capital financing project authorization and execution (Dayananda et al., 2002). Several conclusions or debates are made at each point of capital budgeting because this is what culminates in the decision on capital budgeting and it is important to execute them. Therefore, it is important to explain how the procedure was carried out and how the decisions were taken justified, thus their effect on the companies' profitability.

Several studies carried out to evaluate the connection among the firms engaged in the decisions of capital budgeting and the firm's performance. The studies considered evaluated accounting information in order to assess the rationality or the forms in which a business's meet its objectives to optimizing the investors wealth (Christy, 1966; Klammer, 1972).

1.2 Aim of Study

This research aims to analyze and investigate the impact of capital budgeting decisions on performance by using information of manufacture and service sectors for different group of economies, being developing (Jordan, Egypt) and the other developed (Canada, Germany) for time interval 2011-2019. This study mainly seeks to identify if there are any differences on the impact of capital expenditure on performance in countries that vary in income levels. The main question of the study is:

- What is the impact of capital expenditure on performance of firms in two separate group of economies?

1.3 Study Value

This study would help several companies where executives will employ the data to assess the existing practices of capital budgeting in their industries. To have precise keeping an eye on this research, managers will gain more information and familiarity of the capital budgeting techniques that actually amend the resources and value of the business. As well as, they should also make certain associations with the activities of their company. This is important since the primary goal of a corporation is to increase shareholder's profit. The organization needs the most accurate instruments that can assist in investment decision-making to accomplish goal. This thesis will also assist researchers as it will provide academicians with functional knowledge on the strategies of capital budgeting and fiscal results of listed companies. Meanwhile, as they do more study on similar topics, scholar may borrow from this research. The finding would be important for scholar who desire to complete additional or further study in capital planning as it ought to bring more to the existing learning assembly. It would provide them with exhaustive details on how much the structures taught in class differ from those currently rehearsed. Academicians would have the potential to implement a few improvements by trying to suit items learned in class with factual practices by getting this knowledge.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The main purpose of this research is to investigate and examine the effect of capital decisions on the financial performance in listed firms in developing and developed economies. Capital budgeting is extremely relevant topic in finance, a lot of works been performed and done on it. Firms strive to establish effective capital budgeting decisions to optimize financial efficiency and performance, while at the same time firms, especially developing firms seeking to keep costs as low as possible. This chapter different theories of capital budgeting will be discussed.

2.2 The Contingency Theory

In the early 1970s, contingency theory was clearly entrenched and developed as a dominant approach to organizational theory (Child, 1977), it was pointed out and improved by Pike (1986) that argues efficiency of resource allocation it not just matter of embracing a sophisticated , in order for the organization to be efficient and effective a match must be made to fit between the organizations context , structure , design and capital budgeting frameworks that must be applied as part of analysis (Sathe and Watson, 1975; Galbraith, 1977). Pike (1986) contends that the Contingency Theory insist on three aspects of corporate underlying enterprise environmental uncertainty, behavioral controls, and organizational characteristics. According to Haka *et al* (1985) contingency theory focuses attention on effectiveness, both as a criterion of the choice of controls and as a predictor variable.

Haka et al. (1985) rebuke the theory by pointing out the possibility of assumption inversion. They confronted and challenged the fact that firms that acquire extra revenue and thereby promote their overall revenues are employing complex intricated capital budget decisions. Although some critics have experienced the hypothesis, it is considerable for the analysis because it is substantial for corporates investing strategies used by investors and businesses to impact their financial results.

2.3 The Real Option Theory

Myers (1977) coined the Real Options theory which stressed on the need for money related experts and examiners are necessary to have an enormous regard in business enterprise, the aim was to bring the option theory into the area of strategical decision making, Chi et al (2019) indicated that a real option is a prerogative unlimited and free of any commitment or obligation to apply specified future disposal at certain cost in regarding to tangible or intangible asset. As Bowman and Hurry (1993) have shown, there would be a need for a company to discover and recognize prior and probable activities as well as prospects that firm capital endowments and capabilities could firms generate in the future. Usually, the value of real options is specific and with the expiration, it disappears if the firm decides not to exercise it (Myers, 1977).

Hult et al. (2010) have imputed increased regard to supply and demand intensity for real options. The demand aspect of real options reflects the management role of the organization to earn through weakness and to impart the main adaptability of the association, while for supply aspect represents an increasing collection of texts related to the real option approach (Arnold & Shockley Jr, 2002). Company managers are increasingly thinking about the use of actual alternatives explained by massive capital speculations and comprehensive adaptability and vulnerability, for example,

biotechnology, oil, and gas aviation. True alternatives provide a clear pledge that administrators will obtain useful knowledge after investments start. The theory is necessary because it considers the investor's prevision when making investment decisions in publicly traded companies.

2.4 Conventional Capital Budgeting Theory

Capital budgeting is a perpetual multidisciplinary activity including infrastructure, finance, and management. It deals with concerns relating to the size of the budget, specific assets may be used and the type of funding (Gurnani, 1984). Dayananda et al. (2002) contends that capital budgeting is investment decision making mechanism for the firm's new projects, as well as its substantial subject of appraise and analyze regarding utilize and control long-term funding.

The traditional theory of capital budgeting was ascribed and developed by (Woods & Randall, 1989), In order to allocate finite resources to reach optimum performance, companies assess their projects the application of capital budgeting (Peterson & Fabozzi, 2002). Owners hire the management with the intention that can execute their tasks effectively and successfully to maximize the company's assets value. For this purpose, resources with a favorable NPVs are allocated. this process in which the project's feasibility is defined and assessed and finally a determine is taken as to which project to invest in, called the decision on capital budgeting (Bierman Jr & Smidt, 2012). By definition, original used capital should be created before any benefit is derived to accrue a profit out of an investment. The leadership of any business will then announce that the project was responsible for the costs incurred. Therefore, capital budgetary decisions require implementation of effective capital budgeting instruments that provide management with both the process and the strategies required to make

decisions that will boost the basis of business resources and maximize profitability (Bierman Jr & Smidt, 2012). In contrast, asymmetry information problems faced by firms make capital budgeting decisions less efficient (Durnev et al., 2004).

The financial potential of an organization can be understood by equating the money invested and the profits earned in the financial statements of the organization. Profits are referred to as the excess of income over expenditure for a particular operation while the opposite is referred to as wastage (Brealey et al., 2012).

2.5 The Resource-based View (RBV)

The resource-based view (RBV) is one of the most influential theories in the history of management theorizing, due to elegant and its simplicity (Kraaijenbrink et al., 2010), RBV proposes non-replicable and specialized resources that establish competitive advantages for heterogeneity (Wernerfelt, 1984). According to J. Barney, 1991; J. B. Barney (1994) RBV strives to justify a sustainable strategic advantage of the inner resources and assets . The main key idea is that the corporation attains and tracks valuable, rare, unliked inimitable and non-substituted capacities and resources, in addition, organizations need to apply and absorb these resources (Kraaijenbrink et al., 2010), in details, RBV presently comprises main research framework, the RBV combines conventional strategies principles and incorporate diversified heterogeneous competences, the theory is attentive to resources, diversifications, organizational economics growth etc. and translates to the great relevance in the strategic sector (Ansoff, 1965). RBV of the organizations believe that business growth is achieved using specialized resources. Organization resources are perceived as either intangible or tangible especially capital expenditure, and propose

that the appropriate devotion and optimization of either categories of firm resources can contribute into a long-term favorable returns (Henard & McFadyen, 2012).

2.6 Empirical Literature

Wachira (2017) assessed the impact of decisions on capital budgeting in listed companies in Kenya on the its performance, the population for the research were 64 companies, the research employed capital expenditure as the main predictor variable calculated by the natural logarithm of fixed assets, the results found that capital expenditure positively affect the profitability, the study suggested appropriate steps to be placed in place by management of listed companies to boost and raise their profitability by capital expenditure.

Mwangi (2014) studied the influence of capital expenditure on the financial performance of the Nairobi Securities Exchange organizations, the research argues that capital expenditure of the business has an effect on profitability in the sense of a survey study containing 53 corporations listed at the NSE during the period 2009-2013. the study emphasizes the necessity of the management's perception of the effect of policies to increase the shareholders wealth.

Liao et al. (2016) proposed that non-financial performance indicators associated with product qualities and product prices have the capability for company capital expenditure decisions, a survey circulated to 5815 Taiwanese companies in 2005–2012 period, and the results indicated a negative association between company performance and capital expenditure.

Hermes et al. (2007) examined the use of the capital budgeting techniques and their advantages impacting ROA in Dutch and Chinese companies, corresponded to

distributed survey were 42 out of 250 of Dutch and 45 out of 400 of Chinese firms. Their results clearly supported the use of NPV by 49% used by Chinese businesses as opposed to 9% use rest of conventional capital budgeting approaches while extraordinarily, in Netherland 89% of the organizations used NPV approach and the rest 11% applied the other methods, typically they associated their outcomes with profitability, both of the countries mostly used NPV and IRR because it optimistically associated with ROA, whereas other standard approaches irrelevantly reflected.

Puwanenthiren (2016) assessed the effects on business efficiency by utilized capital budgeting arranging. The analysis conducted for Australians and Sri Lankan firms; the sample size consists of a total of 150 organizations. The researcher has compiled secondary data in addition to the primary data. time interval was considered from 2003 to 2012. The study revealed that the use of sophisticated or basic capital budgeting approaches was encouraged by the growth of economic and financial markets.

Khambo (2012) assessed the association between capital budgeting techniques and the growth in the Nairobi industrial firms. The data collection method used was a quantitative template and census survey. The research based on 8 financial officers. The analysis included descriptive statistics and analyzed material. He found that the capital budgeting techniques is in fact a critical factor in industrial companies' growth, based on the assessment of investment decisions made. Valuation determines if companies are successful or not. De Souza & Lunkes (2016) investigated how the success of listed corporations was affected by capital forecasts. The research was conducted and showed that Brazilian listed companies rely mainly on PB, NPV and IRR to decide on investment, the businesses surveyed carried out a coordinated response for risk management in projects.

Kim (1981) centered on the relationship between companies earning efficiency and capital budgeting practices; in 1979, he sent a questioner to 500 industrial corporations to classify financial officers and the essence of their firms; 132 firms replied to the questioner, categorizing them according to industrial category, asset size and market volatility. Sample size was seen to be contingent on the asset size of the responding companies and lower risk companies. The outcome of the study was an optimistic association between earnings performance and capital budgeting methods, while, he stated that it's not designed to suggest that only advanced capital budgeting strategies would contribute to improved performance, there were other considerations influencing the performance of companies such as labor relations, prices of raw materials, invention progress.

Onsongo (2012) attempted to provide experimental proof on usage of financial strategies in Kenya through the evaluation of IT projects. The findings of the valuation indicated that one of the most prevailing investment approaches used by the banks were cost benefit analysis and payback period, Whereas, the less preferred approach was NPV and IRR. Out of the 41 selected banks, 25 responded, which mean 61.97%. Most responding entities have confirmed the use of capital budgeting techniques to estimate and assess their projects are payback period and the return on investment (ROI), 60 % of the reactionary were for both payback period and ROI, relatively small percentage of the respondent banks used NPV and IRR as DCF strategies to analyze IS projects, 8% of the banks use NPV and none of them responded to IRR. In addition to what he was stated that investment in fixed assets requires all ventures to be subject to DCF techniques. Thus, to assess future acquisitions accurately, the company should be able to predict using capital budgeting techniques.

Chapter 3

RESEARCH DATA AND METHODOLOGY

3.1 Introduction

This section consists of and focuses on explaining in detail the methodology utilized by the researcher including research design, variables, gathering and inspecting data used. Furthermore, descriptive statistics, correlation between used variables and regression analysis will be discussed.

3.2 Research Design

Research design is an arrangement that binds research framework elements together by collecting and analyzing the data in a way that seek to combine and fit between of the research purpose (Marczyk et al., 2005). The study employed an expressive layout to assess and infer the effects of capital budgeting that influence the profitability in any organization. This study included two different groups of countries, one of which being developing (Jordan, Egypt) and the other are developed (Germany, Canada), researcher randomly selected 8 companies from manufacture and service sectors, all of the institutions are part of securities exchange markets that belongs to the country itself.

3.3 Source of Data

Derivation and collection of the secondary data used in this study were extracted from Orbis database were the availability of companies' general inputs, outputs, financial information such as income statement, balance sheet elements and global ratios are

accessible. All relevant dependent variable and independent variable identified and captured.

3.4 Sample

The samples used in this study included non-financial firms belongs to two important sectors that significantly affect the economic situation of the developed and developing countries. Usually, the concept of developing and developed countries used by IMF categories of income, which refer to classification of the countries as advanced, emerging and developing economies. According to World Bank, Jordan and Egypt considered as upper-middle income countries while, Germany and Canada considered as high-income countries (Nielsen, 2011; Pearson, 1969).

Table 1: Categories of the countries according to UNDP

Country Name	UNDP	IMF	World Bank
Canada	Developed	Advanced country	High Income County
Germany	Developed	Advanced country	High Income County
Jordan	Developing	Merging and developing country	Low-Middle Income Country
Egypt	Developing	Merging and developing country	Low-Middle Income Country

The sectors included in this research are manufacturing sector which involve the production of basic pharmaceutical, chemicals and petroleum products, on the other

hand service sector which consist of transportation, freight and travel for time interval of 2011-2019.

3.5 Choice of Variables

This section discusses all the variables are used and examined to achieve the main propose of this research. The variables are equivalent to those used by Wachira (2017), Imran (2014), Hull & Dawar (2014), Fosu (2013) and Onaolapo & Kajola (2010).

3.5.1 Dependent Variable

Managers and shareholders highly concentrate on profitability since it's a substantial predictor of institutional decisions and policies. As stated by Wu (2019) Profitability is the ability of the firm to produce higher profit than its cost. Yuliani & Hadi (2020) calls attention to fact that profitability is distributing capability of earned revenue to shareholders, the higher the profitability value of the firm, the greater potential of the firm to increase its profits, in order to call any specific firm profitable, the difference between revenues and expenses must be higher than zero. According to Abor (2005) and Negasa (2016) profitability expressed by different ratios, the most commonly used ratios of the researchers are Return on Assets (ROA), Return on Invested Capital (ROIC) and Return Equity (ROE).

ROA is measure of the performance and effectiveness attained by management after implementing capital budgeting decisions, which does not denote that all corporation do not generate profits, the net ratio clearly indicates a reasonable balance between expected values and the generated values. ROA used as dependent variable, the common target of financial or non-financial firms typically to maximize ROA, as it reflects efficiency and performance which contribute to improvement ,development

and control firms operational and planning financial strategic decisions (Blumenthal, 1998). The formula used to calculate ROA as following:

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \quad (1)$$

3.5.2 Independent Variables

Capital expenditure is the main independent variable. In this research, other variables such as liquidity, leverage and age are used as control variables. The use of control variables is widely practically used as they mostly reduce and eliminate variance associated with the variables. Moreover, it is also an approach used by researchers to reduce the limitations that will be faced in process of data collection (Carlson & Wu, 2012). The association among the variables is clearer to understand by holding control variables.

3.5.2.1 Capital Expenditure

As indicated by Kraaijenbrink et al.(2010), RBV theory emphasizes that the organizations assets are an important element that influences superior management and company implementation. It seeks to clarify internal sources to stabilize the firm's competitive advantage. If a company seeks to reach a state of sustainable competitive advantage, it must maintain and manage valuable resources and abilities which they are essential, rare and not interchangeable (J. Barney, 1991). A profitable company is expected to perform well if it has ample capital and hence competing advantage (Wernerfelt, 1984). Akinfiiev & Tsvirkun (2018) emphasized that companies have different assets classifications consider the possibility of an alternative type of development.

Vernimmen et al. (2014) defined capital expenditure as incurred cost by the organization to purchase, maintain and managing long-term fixed assets such as

properties, equipment's and vehicles which are necessary and required for the continuation of the business enterprise. Yuliani & Hadi (2020) asserts that the more efficiently fixed assets are managed, the higher company performance would be. Capital expenditure occupied that its carries exorbitant costs, which it is an indication of the growth potential that firm will face in future. Managers usually prevent and withhold this type of information to announce it to public in order to not get used by competitive firm's (Jorgensen & Kirschenheiter, 2003).

The consequence of good performance is that it effects and improves the stock value of company as well as it influences capital expenditure to reduce. Results of Rahmiati & Sari (2013) research stated that capital expenditure has significantly positive effect on firm value, which indicate the companies with the higher fixed assets it follows by higher firm value that generate more profits. Capital expenditure measured by taking logarithm of fixed assets.

3.5.2.2 Leverage

According to Shamsuddin (2011), shareholders and managers should pay attention to debt of the company and ability to repay accumulated debt principal and interest, the higher the debt, the higher likelihood that a corporation might not be able to repay (Kasmir, 2014). In other words, in order to measure the willingness of a company to pay all its long-terms and short-term obligations, company has to calculate it leverage ratio (Kartikasari & Merianti, 2016).

A company's financial leverage has been one of the important factors that affect profitability. The greater the leverage ratio, the greater volatility of the returns that shareholder acquired. Some studies have reported a positive connection between profitability and leverage, while others have found negative associations. Leverage

effect performance of the company substantially but depends on the particular circumstances (Lin & Fu, 2017). Modigliani & Miller (1963) and Myers (2001) argued that the theory of tradeoffs suggests that a business improve profits through external debt because interest on debt is subject to tax deductibility. The following formula is used to calculate leverage:

$$\text{Leverage} = \frac{\text{Long-Term Debt}}{\text{Total Assets}} \quad (2)$$

3.5.2.3 Liquidity

Liquidity ratio is one of the essentials financial and accounting metrics used to determine ability to use liquid or current assets to repay firms obligations without any additional external support (Utomo, 2004). It has always been an important element in determining the level of firm performance. Morris & Shinn (2012) were conceptually clarified it as a realizable cash to short-term liabilities in balance sheet. Realistic cash refers to liquid assets, while Ongore & Kusa (2013) defined liquidity as capability of a corporation to meet its commitments. Liquidity ratios indicate the relationship between the firm's current assets of a companies and their current liabilities, and hence the capability to handle mature obligations. Two commonly employed ratios are the quick ratio the current ratio (Brigham & Ehrhardt, 2008). The liquidity of the firm relies on condition of the balance sheet. In order to estimate of the liquidity situation, the classification of assets and liabilities are critically important (Basno & Dardac, 2004).

Analysts typically use liquidity ratios to analyze a company and make judgment. By effectively managing of liquidity and maintaining the sustainability, businesses increase profitability by the reduction of the input requirements. Besides, it benefits the company in economically tough times. Veronika et al. (2014) calls attention to the

fact that liquidity of inventories and receivable may sometimes be deceptive, especially if the company uses normal fiscal business year and company sales are seasonal. The following formula used to measure liquidity:

$$\text{Liquidity ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liability}} \quad (3)$$

3.5.2.4 Age

Age of the company is used as control variable that has a positive impact on profitability according to Recourse-based view (Yazdanfar, 2013). Visible expertise, preferable reputation, more information and dynamic access to market frameworks empower the organizations to manage scarce capital and function more efficiently (Curran et al., 1993). Older companies have much more expertise and network of connections and thus achieve better efficiency (Stinchcombe, 1965). Age value was obtained by the following formula:

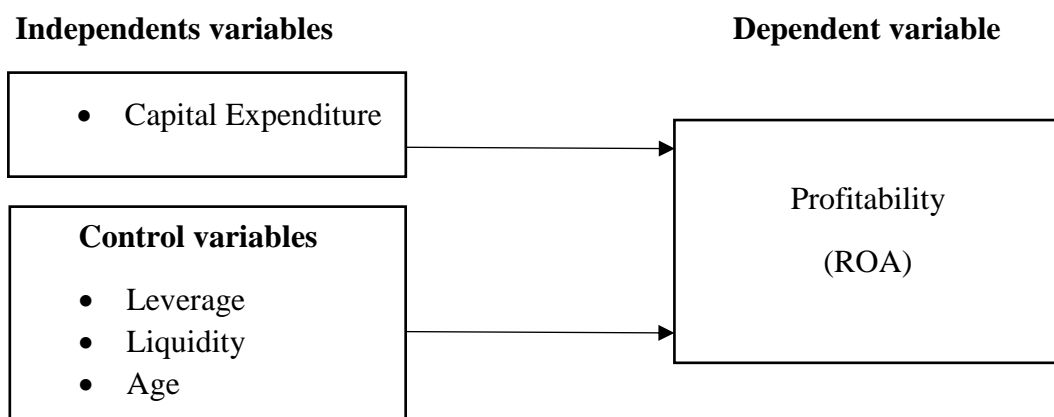
$$\text{Age} = \text{Present Year} - \text{Formation Year} \quad (4)$$

Table 2: Summary table to classify the dependent and independent variables

List of Variable	Dependent Variable	Independent Variables	Abbreviation
Return on Assets	ROA		ROA
Capital Expenditure		CE	CE
Liquidity Ratio		LIQ	LIQ
Leverage Ratio		LEV	LEV
Age		AGE	AGE

3.6 Conceptual Framework

Conceptual framework is a network of connected concepts that offers a detailed interpretation of the specific phenomenon (Jabareen, 2009). In other words, it is a tool that represents the association among research variables (Kombo & Tromp, 2009). In this way, the following results can be clearly understood by demonstrating the relationship between variables.



3.7 Correlation Analysis

One of multiple regression model assumptions is that explanatory variable should not depend on one another. Multicollinearity is phenomenon of the existence of high degree of intercorrelations and association among the explanatory variables in a multiple regression. In order to avoid multicollinearity problem, we use Pearson correlation analysis as stage of testing the correlation between the independent variables by measuring the intensity, direction and the nature of the degree of the linearly relation between one variable to another (Bolboaca & Jäntschi, 2006).

The occurrence of multicollinearity in a model among variables may have the following impact:

- The estimated coefficient vacillates drastically depending on which other explanatory variables are included in the model. As result of that, the coefficients are quite sensitive to slight changes in the model.
- We might not even be able to certain of p-value to recognize the statically significant explanatory variables, as result of diminish the accuracy of coefficient estimated, it weakens the regression model statistical power.

The following two method are used to handle and solve the problem that caused by the existence of multicollinearity:

- Eliminate highly correlated variables from the model.
- Increase the sample size of the study data to reduce standard error.

Adding additional observations, deleting one of the independent variables or establishing a new proxy by integrating the associated variables, solve the problem (Gujarati & Porter, 1999).

3.8 Model Specification

A total of 5 variables are included in this study, one dependent variable (ROA) and the rest of the variables are explanatory variables (capital expenditure, liquidity ratio, leverage ratio, age), all of which were clarified and discussed earlier in this chapter.

The following equation expresses the linear regression model:

$$Y_{i,t} = \alpha + \beta x_{i,t} + \mu_{i,t}$$

Where:

$Y_{i,t}$ = Dependent variable (i) at time (t) in

α = Intercept of the equation

β = Represents the coefficient

$x_{i,t}$ = Variable (i) at time (t)

μ = Error term.

Based on the inclusion of than one independent variable in our study the most convenient model is the panel data multiple regression model. the following multiple regression model is used to answer the research question:

$$ROA_{i,t} = \alpha + \beta_1 CE_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 LEV_{i,t} + \beta_4 AGE_{i,t} + \mu_{i,t}$$

Where:

$ROA_{i,t}$ = Return on Assets of firm (i) at time (t)

$CE_{i,t}$ = Capital Expenditure of firm (i) at time (t)

$LEV_{i,t}$ = Leverage ratio of firm (i) at time (t)

$LIQ_{i,t}$ = Liquidity ratio

$AGE_{i,t}$ = Age of firm (i) at time (t)

β = coefficient (slop)

$\mu_{i,t}$ = Error term of firm (i) at time (t)

Since there is heterogeneity across firms, it is more desirable to implement a random effects model, because it assumes that there could be different of true underlying impacts predestined in each trial which are scattered around the overall mean. We have made assumption that the intercepts, slopes, and variances are random rather than fixed effects (De Leeuw et al., 2008).

3.9 Research Question and Hypothesis

3.9.1 Research Question

What is the impact of capital expenditure on the profitability of the listed firms in two different groups of economies: Developing countries (Jordan, Egypt) and developed countries (Germany, Canada)?

3.9.2 Research Hypothesis

The following alternative hypothesis have been established in order to answer the research question. The hypotheses are similar to those used by Wachira (2017), Imran (2014), Hull & Dawar (2014) and (Pouraghajan, 2012).

Ho 1: The relationship between capital expenditure and profitability is positively significant.

Ho 2: The relationship between liquidity and profitability is positively significant.

Ho 3: The relationship between leverage and profitability is negatively significant.

Ho 4: The relationship between age of the company and profitability is positively significant.

3.10 Data Analysis and Techniques

Three various techniques often used to analyze pooled panel data through pooled ordinary least squared (OLS), random effect data (RE) and fixed effect (FE) (Maddala & Lahiri, 1992). The essential problem of pooled least square model is that time series and cross section nature of data are neglected and assumes that variables have same characteristic. So using pool ordinary least square model ignores the heterogeneity among the companies included in the study, which is not capable (Stock & Watson, 2011).

A robust random-effect model allows non-recurring method to estimate inter-study variations treatment of variance effect. Meanwhile, it integrates disparities of the inter-study effectiveness overall treatment analysis (Cochran, 1954). If you believe that there are no excluded variables or the excluded variables are not associated the model exist explanatory variables, then random effect model is appropriate (Williams & Dame, 2015). Robust random effect model presumes that all individuals have mutual mean for intercept therefore, standard error of the data will be minimized (Kackar & Harville, 1984).

To decide whether random effect model or fixed effect model is suitable for analyzing the obtained data, Griliches & Hausman (1986) suggested to applying Hausman test. This test utilizes the random effect result, where the null hypothesis test assumes that the random effect model is appropriate in contrast. Alternative hypothesis assumes that fixed effect model is appropriate. Meanwhile, in order to not reject null hypothesis, the probability value has to be higher than 5%. Otherwise, we reject null hypothesis and imply fixed effect model.

3.11 Test of Significance

The F-test and t-test were used 95 % level of confidence to test statistical significance. The t-test was utilized to measure the significance for coefficient meanwhile, F-test established to test validity of the significance of the regression equation (Taylor et al., 2012).

Chapter 4

EMPIRICAL RESULT

In this chapter, the empirical result for descriptive statistics, correlation and outcome regression analysis are scrutinized, discussed, and compared with previous researches. The study targeted 64 publicly listed firms. Secondary data was gathered and obtained from Orbis database. Study consists of two sectors (manufacturing, service) and eight companies from each sector from two different group of economies from different stage of development (developing, developed). The initial dataset composed of 576 observations from 2011 to 2019.

4.1 Descriptive Statistics

Descriptive statistics is the simplest perform of the summarization, beneficial and useful statistical analysis that provide description and interpretation of central tendency and variance of the obtained observations of the study. It does not provide any causal information (Fisher & Marshall, 2009). All presented implied variables are indicated and briefly summarized including its mean, median, maximum, minimum and standard deviation in three parts which are for both developed countries (Germany and Canada) as well as developing countries (Jordan, Egypt).

Table 3: Descriptive statistics presentation for both groups of developed with developing economies

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
ROA	576	0.013	0.0287	0.592	-1.898	0.140
CE	576	18.545	18.348	23.46	12.612	2.181
LIQ	576	1.432	1.175	12.10	0.026	1.101
LEV	576	0.153	0.107	1.209	0	0.155
AGE	576	40.171	28	142	4	32.380

As can be seen from table 3 which shows the entire data samples outcome, in term of ROA ratio which used to measure the efficiency of the institutions used assets lies between -1.898 to 0.592. This indicates that there are massive differences in term of ROA among firms and some of them with negative net income (their expenses are higher than the profit generated). The mean value of 1.3% shows that approximately 1.3% is the net earnings for every dollar worth of business asset with a standard deviation of .140. Capital expenditures' maximum and the minimum value are 23.465 and 12.612 respectively with mean value of 18.54 and standard deviation of 2.181.

Liquidity lies between 0.026 to 12.101 with the mean value of 1.432. This indicates that firms are moderately liquid. Leverage lies in range from 0 - 1.209 this signify that some of the firms are unleveraged (funded by equity). On the other hand, the other firms are levered (funded by debt) and with mean value of 0.153. This indicates that 15% is the amount of debt a firm used to finance their assets; standard divination is 0.155.

Table 4: Descriptive statistics of variables for developing economies (Jordan and Egypt)

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
ROA	288	0.0213	0.026	0.341	-0.462	0.101
CE	288	17.326	17.329	21.061	12.612	1.558
LIQ	288	1.287	1.141	6.322	0.026	0.859
LEV	288	0.092	0.034	0.454	0	0.117
AGE	288	28.5	24.5	81	5	15.152

Table 4 presents the descriptive statistics for the developing economies for time interval from 2011 to 2019. ROA lies in range of -0.462 and 0.341, mean value is 0.021 which indicate the net profit is on average of 2.1% the net earnings for every dollar worth of business total asset, with standard deviation of 0.101.

Capital expenditures lies in range 12.612-21.061, with a mean value of 17.326 and standard deviation of 1.558. Liquidity mean value is 1.287. This shows on average that current assets net of inventories is 1.287 times the current liability. Maximum value is 6.322, minimum value is 0.026 and with standard deviation of 0.859. Leverage lies in range of 0- 0.454, the mean value is 0.092, standard deviation equal to 0.117.

Table 5: Descriptive statistics of variables for developed economies (Canada, Germany)

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
ROA	288	0.005	0.029	0.592	-1.898	0.171
CE	288	19.765	19.967	23.46	13.656	2.028
LIQ	288	1.577	1.207	12.10	0.065	1.284
LEV	288	0.214	0.209	1.209	0	0.165
AGE	288	51.843	45	142	4	39.970

Table 5 presents summary of descriptive statistics for developed economies. The maximum value of ROA is 0.592, while minimum value is -1.898, the mean value is 0.005, standard deviation equal to 0.171. This shows that ROA is relatively lower than of the developing economies firms. Capital expenditure lies in range 13.656-23.465, the mean value is 19.765, and standard deviation is 2.028. The mean value of liquidity equals to 1.577, with standard deviation 1.284. Leverage lies between 0-1.209 with mean value of 0.214, standard deviation equal to 0.165.

4.2 Correlation Analysis

As mentioned earlier, in multiple regression model multicollinearity problem arises when there is a high correlation present among explanatory variables of the study. Correlation analysis test measures the existence of multicollinearity. When the correlation between variables are greater than 0.8-0.9 multicollinearity problem occurs (Lewis-Beck, 1993).

Table 6: Pearson Correlation Matrix for both economies 2011-2019

	ROA	CE	LIQ	LEV	AGE
ROA	1	-	-	-	-
CE	0.092855**	1	-	-	-
LIQ	0.223605***	-0.11999***	1	-	-
LEV	-0.25555***	0.442079***	-0.10506**	1	-
AGE	0.074076*	0.334818***	0.153173***	0.011053	1

*Represent correlation is significant at 10% level (90 confidence interval)

**Represent correlation is significant at 5% level (95 confidence interval)

***Represent correlation is significant at 1% level (99 confidence interval)

The result based on table 6 illustrates a significant positive association at 5% level between ROA and capital expenditure ($r=0.092855$, $p=0.0258$), while as anticipated the correlation between ROA and leverage ratio is significantly negative at 1% level ($r=-0.25555$, $p=0.0$). As noted, that the associations among that explanatory variables are less than 0.8, which implies that there is no multicollinearity problem. Therefore, the study of the regressors in the regression can be used as determinants that affect the profitability of the listed companies.

Table 7: Pearson correlation matrix for developing countries for time interval 2011-2019

	ROA	CE	LIQ	LEV	AGE
ROA	1	-	-	-	-
CE	0.153331***	1	-	-	-
LIQ	0.450981***	-0.122337**	1	-	-
LEV	-0.254877***	0.318603***	-0.201004***	1	-
AGE	0.144464**	0.013114	0.043540	- 0.257802***	1

*Represent correlation is significant at 10% level (90 confidence interval)

**Represent correlation is significant at 5% level (95 confidence interval)

***Represent correlation is significant at 1% level (99 confidence interval)

Table 8: Pearson correlation matrix for developed countries for time interval 2011-2019

	ROA	CE	LIQ	LEV	AGE
ROA	1	-	-	-	-
CE	0.150777**	1	-	-	-
LIQ	0.147450**	-0.294737***	1	-	-
LEV	-0.255084***	0.277151***	-0.158137***	1	-
AGE	0.093699	0.228106***	0.136102**	0.130378**	1

*Represent correlation is significant at 10% level (90 confidence interval)

**Represent correlation is significant at 5% level (95 confidence interval)

***Represent correlation is significant at 1% level (99 confidence interval)

Based on table 7, which illustrates a significant positive association at 1% level between ROA and capital expenditure ($r=0.153331$, $p=0.0092$), while as expected the correlation between ROA and leverage ratio is significantly negative at 1% level ($r=-0.254877$, $p=0.0$). Besides, the table shows an optimistic correlation as the evidence of 1% level of significance ($r=0.450981$, $p=0.0$) between liquidity and ROA. As noted,

that the associations among that explanatory variables are less than 0.8, which implies that there is no multicollinearity problem, hence, the study of the regressors in the regression can be used as determinants that affect the profitability of the listed companies.

The result based on table 8, which clarify the optimistic significant correlation at 5% level between ROA and capital expenditure ($r=0.150777$, $p=0.0104$), while as anticipated the correlation between ROA and leverage ratio is significantly negative at 1% level ($r= -0.255084$, $p=0.0$). There also exists a positive correlation as the evidence with 1% level of significance ($r=0.147450$, $p=0.0122$) a positive correlation between both ROA and liquidity, as noted that the associations among that explanatory variables are less than 0.8, which implies that there is no multicollinearity problem. Therefore, the study of the regressors in the regression can be used as determinants to measure the effect on profitability of the listed companies.

4.3 Hausman Test

As stated in the third chapter, in order to choose appropriate model, Hausman test must be applied. Since the probability value of the test result were 0.2301 which is significant and greater than 5%, the null hypothesis was rejected. This ensures that error terms and the intercept are various among the variables.

4.4 Outcomes of Regression Analysis

In this section, we first present the OLS regression results with the following four tables (table 9-12) and then continue with robustness checks where random effect method is adapted. We also provide full details of the estimations in the appendix of the thesis.

4.4.1 Outcomes of OLS Regressions

Table 9: OLS regression for both developed and developing economies for time interval 2011-2019

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.328***	0.052	-6.264	0.0000
CE	0.019***	0.003	6.492	0.0000
LIQ	0.029***	0.005	5.859	0.0000
LEV	-0.328***	0.039	-8.428	0.0000
AGE	-0.000***	0.0001	-1.380	0.168

R-Squared= 0.168 DW stat = 0.73 F-statistics = 28.835 Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

From table 9, we observe that the Durbin-Watson value is 0.732 and F-test is equal to 28.83 with probability value equal to 0.000. These implies that regression model perfectly suits the data and that it is enforceable to make decisions. R-square of established regression is 0.168, which present that 16.8% variations in the dependent variable can be explained by independent variables in the model and the rest 83.2% can be illustrated by the other variables which are not settled in the model. We find similar results when we add interaction to our model and when the regressions are run separately both for developed and developing economies. See following tables 10,11 and 12 for details. The interpretation of each variable is done under random effect results which are observed to be better than OLS regression results.

Table 10: OLS regression for developed economies for time interval 2011-2019

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.464***	0.102	-4.509	0.0000
CE	0.025***	0.005	4.881	0.0000
LIQ	0.025***	0.007	3.289	0.0011
LEV	-0.326***	0.060	-5.394	0.0000
AGE	-0.0001	0.0002	-0.734	0.4632

R-Squared= 0.150 DW stat = 0.811 F-statistics = 12.55 Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

Table 11: OLS regression for developing economies for time interval 2011-2019

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.364***	0.063132	-5.770164	0.0000
CE	0.018***	0.003531	5.313926	0.0000
LIQ	0.051***	0.006000	8.585909	0.0000
LEV	-0.204***	0.049246	-4.150586	0.0000
AGE	0.000	0.000346	0.368485	0.2622

R-Squared= 0.309926 DW stat = 0.544395 F-statistics = 25.33042
Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

Table 12: OLS regression for both developed and developing economies for time interval 2011-2019 (with interaction)

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.403***	0.069	-5.809	0.0000
CE	0.022***	0.003	6.634	0.0000
LIQ	0.033***	0.005	6.484	0.0000
LEV	-0.295***	0.040	-7.311	0.0000
AGE	-0.0001	0.000	-1.035	0.3011
Developed (0) – Manufacture (1)	-0.026*	0.016	-1.663	0.0968
Developing (1) – Service (0)	0.024	0.018	1.326	0.1850
Developing (1) – manufacture (1)	0.0275	0.020	1.354	0.1762

R-Squared= 0.186 DW stat = 0.753 F-statistics = 18.587 Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

4.4.2 Outcomes of Random Effect Regressions

The result of the random effect regression analysis presented in the table 13 below is for both groups of economies. The Durbin-Watson test check the autocorrelation in the model and the value is 1.0953. This value is acceptable since it lies between 1-2. The F-test as it exposed in table 13 equals to 22.751 which represents the level of presence of gauge between both dependent and independent variables. The probability value is 0. The tests show that proposed regression model fits the data well and is applicable to make proper decisions. The R-square of the obtained regression is 0.137469, which signifies that 13.7469% of the variation can be explained by

independent variables. The test results in table 11, 12, and 13 are similar which implies that models are all appropriate and applicable for decision making.

Table 13: Random effect regression for both of developing and developed economies for time interval 2011-2019

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.2678***	0.0899	-2.9788	0.0030
CE	0.0167***	0.0050	3.3060	0.0010
LIQ	0.0250***	0.0054	4.6186	0.0000
LEV	-0.3658***	0.0456	-8.0235	0.0000
AGE	-0.0002	0.0003	-0.5593	0.5762

R-Squared= 0.137469 DW stat = 1.095317 F-statistics = 22.75129

Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

Table 14: Random effect regression for both of developing and developed economies (with interactions) for time interval 2011-2019

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.271**	0.117	-2.305	0.021
CE	0.017***	0.005	3.032	0.002
LIQ	0.025***	0.005	4.699	0.00
LEV	-0.0002***	0.045	-7.827	0.00
AGE	-0.000	0.0003	-0.582	0.560
Developed (0) – Manufacture (1)	-0.034	0.031	-1.099	0.271
Developing (1) – Service (0)	0.003	0.034	0.089	0.929
Developing (1) – manufacture (1)	-0.004	0.037	-0.109	0.912

R-Squared= 0.1408 DW stat = 1.095 F-statistics = 13.297 Probability

(F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

Table 15: Random effect regression for developed economy for time interval 2011-2019

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.383**	0.168	-2.277	0.023
CE	0.023***	0.008	2.725	0.006
LIQ	0.022***	0.008	2.724	0.006
LEV	-0.447***	0.066	-6.721	0
AGE	-0.0003	0.0004	-0.694	0.488

R-Squared= 0.164 DW stat = 1.121 F-statistics = 13.972 Probability (F- statistics) =0.0000

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

Table 16: Random effect regression for developing economy for time interval 2011-2019

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.201*	0.108	-1.849	0.065
CE	0.008	0.006	1.467	0.143
LIQ	0.033***	0.006	5.192	0
LEV	-0.1*	0.057	-1.756	0.08
AGE	0.001*	0.0006	1.772	0.077

R-Squared= 0.103 DW stat = 0.852 F-statistics = 8.2003
Probability (F- statistics) =0.000003

Confidence interval test of the coefficient at 99%, 95% and 90%, *, **, *** shows level of significance of the coefficients 1%,5%,10% significance level respectively.

In the following sections we explain and interpret the estimation results in detail. We start with the main variable of this study which capital expenditure.

4.5 Capital Expenditure

As shown in tables above capital expenditure has positive and significant impact on financial performance. The magnitude of the impact has been found to be different for different group of economies. When capital expenditure increases by one unit, this increase is reflected positively in financial performance by 0.019 with OLS model for all economies. The magnitude of the impact of capital spending is found to be slightly lower, 0.016 with random effect model which has been used as robustness. These results follow Imran (2014) who found that capital expenditure influences profitability positively.

When we regress capital expenditure against performance with the economies grouped according to their stage of development, we find that positive association between capital expenditure and profitability is higher in developed economies relative to developing economies, being 0.025 and 0.018 respectively. This clearly indicates that firms in developed economies have better project evaluation means and make better capital budgeting decisions.

In contrast, the result of the random effect regression for developing countries regression in table 16, T-prob equal to 0.1433 (higher than 10% significance level), which point out that there is no noteworthy association between capital expenditure and profitability. Overall, we find that capital expenditure in all of the OLS regressions have positive and significant impact on the profitability presented in Tables 9,10,11 and 12 tables.

4.6 Liquidity Ratio

Regarding to OLS and random effect regressions for both group of economies that obtained above, there is a strong significant positive association between liquidity and profitability. As presented in tables 9 and 13 there is a positive significant level relation among liquidity and profitability. Thus, the results of increasing by one unit of liquidity leads to an enhancement in the firms' profitability by 0.029 and 0.0250 respectively. It is identical in terms of both developing and developed regressions in OLS and random effect regressions. As shown in OLS regressions and in random effect regressions for developed and developing countries, an increase in one unit of liquidity ratio will boost up profitability of the firms by as much as liquidity coefficient.

The results are similar to Hull & Dawar (2014), who also found a significant positive association between liquidity and profitability. This implies that the several advantages of working capital superior control and profits accruing due to reduction in interest cost.

4.7 Leverage Ratio

As expected, there is a strong inverse relation among leverage and performance. According to all above regressions, leverage coefficients values were found to be negatively associated and significant. An increase in leverage by one-unit leads to decrease in the profitability by leverage coefficient value.

These result do not agree with Fosu (2013) who found that leverage has a significant positive impact on profitability. (Noe, 1988) and Heinkel (1982) suggested any

additional increase in debt acquisition could have a positive effect on firm valuation and performance.

4.8 Age

As can be noticed from the result of the previous models, ROA as measure of profitability is not associated with the used control variable age in general. The probability values of Age are higher than the three levels of significance which implies that there is no significant association between age and profitability for the selected sample firms. This is except for developing countries random regression where a significant positive value equal to 0.001 is found. This finding is consistent with Onaolapo & Kajola (2010).

4.9 Dummies

In addition to explanatory variables, country's level of development (developed and developing) and sector (manufacturing and services) dummies have also been added to models. However, the regression results did not show much significant difference with dummies. The only significant finding was under OLS model where we observed that manufacturing firms in developing countries earn relatively less than those in developed economies. The interaction terms derived from the stage of development and sectors were also not found significant.

Chapter 5

CONCLUSION, RECOMMENDATION AND LIMITATION

The main aim of this study is to inspect the decisions of capital budgeting and its influences on financial performance of listed firms in Canada, Germany, Jordan, and Egypt. The paramount independent variable is capital expenditure. The study used liquidity, leverage, and age controls variables. The research espoused a descriptive panel data obtained from Orbis where EViews10 software has been used for analysis. Annual data of firms covered time interval of nine years from January 2011 to December 2019.

Estimation results indicate that there exists a positive association between capital expenditure and profitability. The relationship between liquidity and profitability also found to be positive. The study also estimated a strong negative relationship between leverage and profitability.

5.1 Conclusion

Based on this study findings, the results indicate that profitability of listed firms is notably influenced by company's capital expenditure, liquidity and leverage both in OLS and random regressions models. Therefore, the study showed that capital expenditure has a positive impact on profitability of listed firms. Accordingly, it is concluded that an increase in capital expenditure contributes to an increase in profitability.

The study revealed that liquidity has a significant positive effect that led to an arise in profitability if it increases. Leverage displayed a clear unfavorable association with profitability, which interpreted to decrease in profitability when leverage increases. This research concluded that chosen explanatory variables except age affects profitability as declared by the P-value in the ANOVA analysis in developing and developed in listed companies.

5.2 Recommendation

This study instituted favorable influence of capital expenditure on profitability in listed firms. This research stimulates the firm management a sufficient and suitable handle to enhance and maximize their profitability through managing capital expenditure. Briefly interpretation of the early analysis of the impact of investment in capital expenditure in developed economies are significant and much higher than developing economies. This demonstrates that the developing countries need to be careful before accepting and entering a new investment. They have to utilize and enhance their projects appraising and evaluation better to be able to manage their capital expenditure. This is because a new investment does not always mean it is successful and profitable investment. Companies have to assess and mediate their newly invested assets and to applying capital budgeting techniques before undertaking any projects.

Liquidity was also realized to have significant positive association with profitability in both listed firms in developing and developed countries. The study suggests that firms need to monitor liquidity carefully to be able to respond to unexpected liquidity crisis.

Leverage recognized to have a negative significant effect on the performance companies in both developed and developing economies. The research recommendation is that companies must build up decent capital structure to find an evenness between benefit from avoid paying tax by debt and the limit of bankruptcy costs. High amounts of financial debt have been reflected to decrease the profitability of listed companies. Management of the companies should maintain a level of debt that does not adversely affect profitability to guarantee that it does not interfere with the main purpose of the companies achieved, which is to optimize and improve shareholder wealth.

By the fact that firms in developed economies adapted better system for project evaluation, study recommend that developing country firms also to adapt proper means for investment appraisal.

5.3 Study Limitation

The time interval of this study was from 2011 to 2019. It is unclear whether the outcomes would be similar beyond 2019 or not. The longer sample scope, the more accurate and reliable as it would take into consideration the significant events that was not taken into this study.

The accuracy of the data is one of the limitations of the research. It is hard to ascertain from this study whether the results present the real acquaintances about the situation. It is only intended to be accurate based on the available data and current conditions which can vary from year to year. The research utilized secondary data that has been previously obtained and may be improved by complementary primary data from the firms. This research simply considered only selected variables not all variables

influencing the financial performance of the listed firms due to availability. The researcher tried to add more variables such as returns on equity as dependent and size (total assets, sales) as another independent variable. However, the test showed that they are not appropriate and fit for the considered models.

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APPENDICES

Appendix A: Correlation Matrix

Pearson Correlation Matrix for both economies

Covariance Analysis: Ordinary

Date: 01/03/21 Time: 16:33

Sample: 2011 2019

Included observations: 576

Correlation		ROA	CE	LIQ	LEV	AGE
Probability						
ROA		1.000000 -----				
CE		0.092855 0.0258	1.000000 -----			
LIQ		0.223605 0.0000	-0.119987 0.0039	1.000000 -----		
LEV		-0.255554 0.0000	0.442079 0.0000	-0.105057 0.0116	1.000000 -----	
AGE		0.074076 0.0757	0.334818 0.0000	0.153173 0.0002	0.011053 0.7912	1.000000 -----

Pearson Correlation Matrix for both economies for developing economies

Covariance Analysis: Ordinary

Date: 02/27/21 Time: 23:16

Sample: 2011 2019

Included observations: 288

Correlation		ROA	CE	LIQ	LEV	AGE
Probability						
ROA		1.000000 -----				
CE		0.153331 0.0092	1.000000 -----			
LIQ		0.450981 0.0000	-0.122337 0.0380	1.000000 -----		
LEV		-0.254877 0.0000	0.318603 0.0000	-0.201004 0.0006	1.000000 -----	
AGE		0.144464 0.0141	0.013114 0.8246	0.043540 0.4617	-0.257802 0.0000	1.000000 -----

Pearson Correlation Matrix for both economies for developed economies

Covariance Analysis: Ordinary

Date: 02/27/21 Time: 23:24

Sample: 2011 2019

Included observations: 288

Correlation Probability	ROA	CE	LIQ	LEV	AGE
ROA	1.000000 -----				
CE	0.150777 0.0104	1.000000 -----			
LIQ	0.147450 0.0122	-0.294737 0.0000	1.000000 -----		
LEV	-0.255084 0.0000	0.277151 0.0000	-0.158137 0.0072	1.000000 -----	
AGE	0.093699 0.1126	0.228106 0.0001	0.136102 0.0209	-0.130378 0.0269	1.000000 -----

Appendix B: Hausman Test

Correlated Random Effects - Hausman Test

Equation: OLS

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.611457	4	0.2301

Hausman test for random effect regression of developed countries

Correlated Random Effects - Hausman Test

Equation: DEVELOPED

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.690700	4	0.0693

Hausman test for random effect regression of developing countries

Correlated Random Effects - Hausman Test

Equation: OLS

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.689191	4	0.0054

Hausman test for random effect regression of developing and developed countries

Correlated Random Effects - Hausman Test

Equation: INTERACTION

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.616452	4	0.0714

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CE	-0.002413	0.017299	0.000087	0.0350
LIQ	0.020353	0.025715	0.000006	0.0329
LEV	-0.377732	-0.359913	0.000585	0.4612
AGE	-0.000790	-0.000208	0.000003	0.7283

Appendix C: OLS Regressions

OLS regressions for both of developing and developed economies for time interval 2011-2019:

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 01/05/21 Time: 21:23
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.328336	0.052410	-6.264807	0.0000
CE	0.019422	0.002992	6.492241	0.0000
LIQ	0.029471	0.005030	5.859349	0.0000
LEV	-0.328831	0.039014	-8.428631	0.0000
AGE	-0.000252	0.000182	-1.380222	0.1681
R-squared	0.168052	Mean dependent var		0.013376
Adjusted R-squared	0.162224	S.D. dependent var		0.140928
S.E. of regression	0.128992	Akaike info criterion		-1.249496
Sum squared resid	9.500781	Schwarz criterion		-1.211682
Log likelihood	364.8547	Hannan-Quinn criter.		-1.234749
F-statistic	28.83522	Durbin-Watson stat		0.732503
Prob(F-statistic)	0.000000			

OLS regression for both of developing and developed economies with dummies for time interval 2011-2019:

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 01/05/21 Time: 21:24
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.417167	0.068806	-6.062954	0.0000
CE	0.022708	0.003383	6.712565	0.0000
LIQ	0.032810	0.005117	6.412441	0.0000
LEV	-0.301384	0.040224	-7.492647	0.0000
AGE	-0.000145	0.000187	-0.774480	0.4390
DING_DED	0.040585	0.014337	2.830892	0.0048
SECTOR	-0.011416	0.011463	-0.995920	0.3197
R-squared	0.183745	Mean dependent var		0.013376
Adjusted R-squared	0.175138	S.D. dependent var		0.140928
S.E. of regression	0.127994	Akaike info criterion		-1.261595
Sum squared resid	9.321563	Schwarz criterion		-1.208656
Log likelihood	370.3393	Hannan-Quinn criter.		-1.240949

F-statistic 21.34772 Durbin-Watson stat 0.750086
 Prob(F-statistic) 0.000000

OLS regression for both of developing and developed economies with interaction for time interval 2011-2019.

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 01/05/21 Time: 21:22
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.403642	0.069475	-5.809851	0.0000
CE	0.022460	0.003385	6.634389	0.0000
LIQ	0.033208	0.005121	6.484301	0.0000
LEV	-0.295558	0.040424	-7.311522	0.0000
AGE	-0.000198	0.000191	-1.035106	0.3011
DING_DED=0 AND SECTOR=1	-0.026948	0.016201	-1.663332	0.0968
DING_DED=1 AND SECTOR=0	0.024614	0.018549	1.326990	0.1850
DING_DED=1 AND SECTOR=1	0.027591	0.020373	1.354269	0.1762
R-squared	0.186378	Mean dependent var		0.013376
Adjusted R-squared	0.176351	S.D. dependent var		0.140928
S.E. of regression	0.127899	Akaike info criterion		-1.261353
Sum squared resid	9.291502	Schwarz criterion		-1.200851
Log likelihood	371.2696	Hannan-Quinn criter.		-1.237758
F-statistic	18.58751	Durbin-Watson stat		0.753781
Prob(F-statistic)	0.000000			

OLS regression for developing countries for time interval 2011-2019.

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 12/16/20 Time: 10:46
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 32
 Total panel (balanced) observations: 288

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.094655	0.238169	0.397428	0.6914
LNFA	-0.010278	0.012793	-0.803350	0.4225
LIQ	0.026928	0.007296	3.690662	0.0003
LEV	-0.052943	0.067368	-0.785877	0.4327
AGE	0.002631	0.001553	1.693864	0.0915

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.646930	Mean dependent var	0.021345
Adjusted R-squared	0.597892	S.D. dependent var	0.101673

S.E. of regression	0.064473	Akaike info criterion	-2.528683
Sum squared resid	1.047494	Schwarz criterion	-2.070813
Log likelihood	400.1303	Hannan-Quinn criter.	-2.345196
F-statistic	13.19254	Durbin-Watson stat	0.979786
Prob(F-statistic)	0.000000		

OLS regression for developing countries with dummies for time interval 2011-2019.

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/05/21 Time: 21:29
Sample: 2011 2019
Periods included: 9
Cross-sections included: 32
Total panel (balanced) observations: 288

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.364284	0.063132	-5.770164	0.0000
CE	0.018763	0.003531	5.313926	0.0000
LIQ	0.051519	0.006000	8.585909	0.0000
LEV	-0.204401	0.049246	-4.150586	0.0000
AGE	0.000389	0.000346	1.123571	0.2622
SECTOR	0.004084	0.011083	0.368485	0.7128

R-squared	0.309926	Mean dependent var	0.021345
Adjusted R-squared	0.297691	S.D. dependent var	0.101673
S.E. of regression	0.085206	Akaike info criterion	-2.066885
Sum squared resid	2.047320	Schwarz criterion	-1.990573
Log likelihood	303.6314	Hannan-Quinn criter.	-2.036304
F-statistic	25.33042	Durbin-Watson stat	0.544395
Prob(F-statistic)	0.000000		

OLS regression for developed countries for time interval 2011-2019.

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/05/21 Time: 21:31
Sample: 2011 2019
Periods included: 9
Cross-sections included: 32
Total panel (balanced) observations: 288

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.464057	0.102900	-4.509801	0.0000
CE	0.025728	0.005271	4.881024	0.0000
LIQ	0.025794	0.007841	3.289673	0.0011
LEV	-0.326311	0.060493	-5.394207	0.0000
AGE	-0.000185	0.000252	-0.734590	0.4632

R-squared	0.150687	Mean dependent var	0.005407
Adjusted R-squared	0.138683	S.D. dependent var	0.171248
S.E. of regression	0.158930	Akaike info criterion	-0.823492
Sum squared resid	7.148263	Schwarz criterion	-0.759899
Log likelihood	123.5828	Hannan-Quinn criter.	-0.798008
F-statistic	12.55266	Durbin-Watson stat	0.811072
Prob(F-statistic)	0.000000		

OLS regression for developed countries with dummies for time interval 2011-2019.

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 01/05/21 Time: 21:32
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 32
 Total panel (balanced) observations: 288

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.408426	0.112023	-3.645923	0.0003
CE	0.023736	0.005502	4.314346	0.0000
LIQ	0.025768	0.007833	3.289610	0.0011
LEV	-0.324811	0.060445	-5.373676	0.0000
AGE	-0.000256	0.000258	-0.991870	0.3221
SECTOR	-0.025751	0.020607	-1.249662	0.2125
R-squared	0.155365	Mean dependent var		0.005407
Adjusted R-squared	0.140389	S.D. dependent var		0.171248
S.E. of regression	0.158773	Akaike info criterion		-0.822070
Sum squared resid	7.108895	Schwarz criterion		-0.745758
Log likelihood	124.3781	Hannan-Quinn criter.		-0.791489
F-statistic	10.37439	Durbin-Watson stat		0.816780
Prob(F-statistic)	0.000000			

Appendix D: Random Effect Regressions

Random effect regression for both of developing and developed economies

Dependent Variable: ROA
 Method: Panel EGLS (Cross-section random effects)
 Date: 12/30/20 Time: 00:16
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.267769	0.089891	-2.978830	0.0030
CE	0.016679	0.005045	3.306020	0.0010
LIQ	0.024977	0.005408	4.618620	0.0000
LEV	-0.365820	0.045593	-8.023548	0.0000
AGE	-0.000191	0.000342	-0.559311	0.5762

Effects Specification		S.D.	Rho
Cross-section random		0.076756	0.3474
Idiosyncratic random		0.105196	0.6526

Weighted Statistics			
R-squared	0.137469	Mean dependent var	0.005558
Adjusted R-squared	0.131427	S.D. dependent var	0.113034
S.E. of regression	0.105345	Sum squared resid	6.336676
F-statistic	22.75129	Durbin-Watson stat	1.095317
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.162832	Mean dependent var	0.013376
Sum squared resid	9.560395	Durbin-Watson stat	0.725982

Random effect regression for both of developing and developed economies with dummies

Dependent Variable: ROA
 Method: Panel EGLS (Cross-section random effects)
 Date: 01/04/21 Time: 22:36
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.284549	0.116073	-2.451464	0.0145
CE	0.017486	0.005687	3.074792	0.0022
LIQ	0.025641	0.005468	4.689242	0.0000
LEV	-0.361758	0.045850	-7.889970	0.0000
AGE	-0.000159	0.000348	-0.457876	0.6472

DING_DED	0.018053	0.025875	0.697694	0.4857
SECTOR	-0.020161	0.021875	-0.921646	0.3571
Effects Specification				
			S.D.	Rho
Cross-section random			0.074974	0.3368
Idiosyncratic random			0.105196	0.6632
Weighted Statistics				
R-squared	0.140256	Mean dependent var		0.005667
Adjusted R-squared	0.131190	S.D. dependent var		0.113292
S.E. of regression	0.105599	Sum squared resid		6.345041
F-statistic	15.47083	Durbin-Watson stat		1.093537
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.173835	Mean dependent var		0.013376
Sum squared resid	9.434742	Durbin-Watson stat		0.735424

Random effect regression for developed economy for time interval 2011-2019

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Date: 01/04/21 Time: 22:39

Sample: 2011 2019

Periods included: 9

Cross-sections included: 32

Total panel (balanced) observations: 288

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.383406	0.168379	-2.277039	0.0235
CE	0.023623	0.008667	2.725608	0.0068
LIQ	0.022111	0.008116	2.724333	0.0068
LEV	-0.447769	0.066613	-6.721909	0.0000
AGE	-0.000322	0.000464	-0.694374	0.4880
Effects Specification				
			S.D.	Rho
Cross-section random			0.091471	0.3266
Idiosyncratic random			0.131354	0.6734
Weighted Statistics				
R-squared	0.164917	Mean dependent var		0.002335
Adjusted R-squared	0.153113	S.D. dependent var		0.143913
S.E. of regression	0.132438	Sum squared resid		4.963783
F-statistic	13.97208	Durbin-Watson stat		1.121083
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.134745	Mean dependent var		0.005407
Sum squared resid	7.282444	Durbin-Watson stat		0.764141

Random effect regression for developing economy for time interval 2011-2019

Dependent Variable: ROA
 Method: Panel EGLS (Cross-section random effects)
 Date: 01/04/21 Time: 22:44
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 32
 Total panel (balanced) observations: 288
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.201075	0.108720	-1.849465	0.0654
CE	0.008994	0.006127	1.467833	0.1433
LIQ	0.033889	0.006527	5.192120	0.0000
LEV	-0.100333	0.057109	-1.756863	0.0800
AGE	0.001131	0.000638	1.772108	0.0775

Effects Specification		S.D.	Rho
Cross-section random		0.055184	0.4228
Idiosyncratic random		0.064473	0.5772

Weighted Statistics			
R-squared	0.103867	Mean dependent var	0.007746
Adjusted R-squared	0.091201	S.D. dependent var	0.068896
S.E. of regression	0.065679	Sum squared resid	1.220785
F-statistic	8.200325	Durbin-Watson stat	0.852623
Prob(F-statistic)	0.000003		

Unweighted Statistics			
R-squared	0.257243	Mean dependent var	0.021345
Sum squared resid	2.203623	Durbin-Watson stat	0.472344

Random effect regression for developing economy for time interval 2011-2019 (with interaction)

Dependent Variable: ROA
 Method: Panel EGLS (Cross-section random effects)
 Date: 02/27/21 Time: 23:12
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 64
 Total panel (balanced) observations: 576
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.271738	0.117871	-2.305384	0.0215
CE	0.017299	0.005704	3.032822	0.0025
LIQ	0.025715	0.005472	4.699117	0.0000
LEV	-0.359913	0.045982	-7.827288	0.0000
AGE	-0.000208	0.000357	-0.582071	0.5607
DING_DED=0 AND SECTOR=1	-0.034382	0.031263	-1.099764	0.2719
DING_DED=1 AND SECTOR=0	0.003107	0.034891	0.089040	0.9291
DING_DED=1 AND SECTOR=1	-0.004067	0.037143	-0.109502	0.9128

Effects Specification			
		S.D.	Rho
Cross-section random		0.075233	0.3384
Idiosyncratic random		0.105196	0.6616
Weighted Statistics			
R-squared	0.140800	Mean dependent var	0.005651
Adjusted R-squared	0.130211	S.D. dependent var	0.113253
S.E. of regression	0.105623	Sum squared resid	6.336732
F-statistic	13.29714	Durbin-Watson stat	1.095348
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.175892	Mean dependent var	0.013376
Sum squared resid	9.411245	Durbin-Watson stat	0.737514

Random effect regression for developed economy for time interval 2011-2019 with interaction

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 01/04/21 Time: 22:29
Sample: 2011 2019
Periods included: 9
Cross-sections included: 32
Total panel (balanced) observations: 288
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.319047	0.184761	-1.726812	0.0853
CE	0.021488	0.009067	2.369857	0.0185
LIQ	0.021868	0.008133	2.688577	0.0076
LEV	-0.446915	0.066809	-6.689480	0.0000
AGE	-0.000420	0.000483	-0.869787	0.3852
SECTOR=1	-0.033833	0.039425	-0.858167	0.3915

Effects Specification			
		S.D.	Rho
Cross-section random		0.092895	0.3334
Idiosyncratic random		0.131354	0.6666
Weighted Statistics			
R-squared	0.167305	Mean dependent var	0.002305
Adjusted R-squared	0.152541	S.D. dependent var	0.143742
S.E. of regression	0.132326	Sum squared resid	4.937838
F-statistic	11.33192	Durbin-Watson stat	1.128912
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.139250	Mean dependent var	0.005407
Sum squared resid	7.244526	Durbin-Watson stat	0.769461

Random effect regression for developing economy for time interval 2011-2019 with interaction

Dependent Variable: ROA
 Method: Panel EGLS (Cross-section random effects)
 Date: 01/04/21 Time: 22:28
 Sample: 2011 2019
 Periods included: 9
 Cross-sections included: 32
 Total panel (balanced) observations: 288
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.221950	0.116366	-1.907349	0.0575
CE	-0.014189	0.008508	-1.667802	0.0965
LIQ	0.028255	0.006519	4.333992	0.0000
LEV	-0.083597	0.056999	-1.466649	0.1436
SIZE	0.027062	0.006761	4.002527	0.0001
AGE	0.000569	0.000667	0.853144	0.3943
SECTOR=1	-0.036815	0.024548	-1.499686	0.1348

Effects Specification		S.D.	Rho
Cross-section random		0.056868	0.4518
Idiosyncratic random		0.062643	0.5482

Weighted Statistics			
R-squared	0.145876	Mean dependent var	0.007357
Adjusted R-squared	0.127638	S.D. dependent var	0.068291
S.E. of regression	0.063784	Sum squared resid	1.143220
F-statistic	7.998664	Durbin-Watson stat	0.832411
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.286195	Mean dependent var	0.021345
Sum squared resid	2.117729	Durbin-Watson stat	0.449363