



Faculty of Economics and Business

**Impact of Non-Current Assets on the Performance of Firms in Malaysian
Construction Sector**

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Impact of Non-Current Assets on the Performance of Firms in Malaysian Construction Sector

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



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ABSTRACT

Efficient asset management on non-current assets is particularly important for a business because it increases shareholders' value. For this to happen, management must carefully analyse the options in deciding on the amount of investment needed on non-current assets in its business operations. This research study concerns the effects of non-current assets for construction firms listed in Bursa Malaysia and their relationship with firms' performance. The efficiency of the firms' non-current assets is measured by fixed assets turnover, asset tangibility, and total assets turnover mated with return on assets (ROA) and return on equity (ROE), both proxies for firms' performance. The data collected and analysed in this research focused on the construction sector listed firms under Bursa Malaysia covering the period of 2011 to 2017. The methods employed in this research include descriptive analysis, correlation analysis, and fixed effects model to examine the research objectives. The quality of the data is tested by applying normality, multicollinearity, heteroscedasticity, and auto-correlation tests. The overall results show that the non-current asset turnover in the construction sector has a positive impact on the firms' performance (ROA and ROE) and significant for this sector. This means that efficiently used non-current asset in the construction sector leads to an increased revenue and improve shareholders wealth. The results of the present study indicate that there is no impact of asset tangibility on both ROA and ROE. It implies that an increase or decrease in levels of asset tangibility does not lead to any changes in firms' performance. Also, the outcome signifies that total assets turnover does not have an impact on ROA. It means if the construction firms increase in total assets, there will be no changes in ROA. However, total assets turnover has a significantly positive affiliation with firms' performance as measured by ROE. It shows that if the total assets turnover increases, the construction firms are utilising its assets efficiently in the firms'

operational activities resulting increase in revenue and improve firms' performance. These findings are useful for governments, policymakers, and other stakeholders to develop effective policies, rules, or regulations in promoting economic productivity, growth, and best financing decision.

Keywords: Construction, fixed assets turnover, asset tangibility, total assets turnover, firms' performance

Kesan Aset Bukan Semasa terhadap Prestasi Firma di Sektor Pembinaan Malaysia

ABSTRAK

Pengurusan aset yang cekap terhadap aset bukan semasa sangat penting bagi perniagaan kerana meningkatkan nilai pemegang saham. Untuk ini berlaku, pengurusan mesti menganalisis pilihan dengan teliti dalam menentukan jumlah pelaburan yang diperlukan untuk aset bukan semasa dalam operasi perniagaannya. Kajian penyelidikan ini melihat kesan aset bukan semasa untuk syarikat pembinaan yang tersenarai di Bursa Malaysia dan hubungannya dengan prestasi firma. Kecekapan aset bukan semasa syarikat diukur dengan perolehan aset tetap, kebolehlenturan aset, dan jumlah perolehan aset yang disatukan dengan pulangan aset (ROA) dan pulangan ekuiti (ROE), kedua-dua proksi untuk prestasi syarikat. Data yang dikumpulkan dan dianalisis dalam penyelidikan ini tertumpu pada sektor pembinaan yang disenaraikan di Bursa Malaysia yang merangkumi tempoh 2011 hingga 2017. Kaedah yang digunakan dalam penyelidikan ini merangkumi analisis deskriptif, analisis korelasi, dan model kesan tetap untuk meneliti objektif penyelidikan. Kualiti data diuji dengan menerapkan ujian normaliti, multikolineariti, heteroskedastisiti, dan korelasi auto. Hasil keseluruhan menunjukkan bahawa perolehan aset tetap di sektor pembinaan mempunyai kesan positif terhadap prestasi syarikat (ROA dan ROE) dan signifikan bagi sektor ini. Ini bermaksud bahawa aset tetap yang digunakan dengan cekap dalam sektor pembinaan menyebabkan peningkatan pendapatan dan kekayaan bagi pemegang saham. Hasil kajian ini menunjukkan bahawa tidak ada kesan kebolehlenturan aset pada ROA dan ROE. Ini menyiratkan bahawa kenaikan atau penurunan tahap kebolehlenturan aset tidak menyebabkan perubahan dalam prestasi syarikat. Hasil kajian ini juga menunjukkan bahawa jumlah perolehan aset tidak memberi kesan terhadap ROA,

iaitu sebarang peningkatan dalam jumlah perolehan aset tidak mempunyai kesan terhadap ROA. Walau bagaimanapun, jumlah perolehan aset mempunyai hubungan positif yang signifikan dengan prestasi syarikat seperti yang diukur oleh ROE. Ini menunjukkan jika jumlah perolehan aset meningkat, syarikat pembinaan menggunakan asetnya dengan cekap untuk menjana penjualan. Penemuan ini berguna bagi kerajaan, pembuat dasar dan pihak berkepentingan lainnya untuk mengembangkan keputusan, peraturan, atau peraturan yang efektif dalam mempromosikan produktiviti ekonomi, pertumbuhan, dan keputusan pembiayaan terbaik.

Kata kunci: *Pembinaan, perolehan aset tetap, kekentalan aset, jumlah perolehan aset, prestasi firma*

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LIST OF ABBREVIATIONS

ASTA	Asset tangibility ratio
BIPC	Building Industry Presidents' Council
BP	Breusch-Pagan Lagrange Multiplier test
CIDB	Construction Industry Development Board
CLRM	Classical linear regression model
CLRM	Classical linear regression model
CVAS	Collateral value of assets
DOSH	Department of Occupational Safety and Health
DW	Durbin Watson
EPS	Earnings per share
ETA	Expense to assets
FATO	Fixed assets turnover ratio
FEM	Fixed effects model
FLEV	Financial leverage
GDP	Gross domestic product
GMM	Generalized moment method
GPM	Gross profit margin
IBS	Industrialised building system
JB	Jarque-Bera
KPI	Key performance index
MBAM	Master Builders Association Malaysia
MCI	Malaysian construction industry

MFRS	Malaysian Financial Reporting Standards
MNKT	Majlis Negara Kerajaan Tempatan
NCA	Non-current assets
PM	Profit margin
PMC	Project management consultant
Pooled OLS	Pooled ordinary least square regression model
PPE	Property, plant, and equipment
PPP	Public private partnership
REM	Random effects model
ROA	Return on asset
ROE	Return on equity
SIZE	Firms' size
TATO	Total assets turnover ratio
VIF	Variance inflation factor

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

This study focuses on the influence of non-current assets towards firms' performance for the Malaysian construction industry. The justification for the selection of the construction sector is because of its important role towards the socio-economic growth of society. Importantly, the picture of the socio-economic growth of any nation could be calculated or evaluated by the construction industry of that nation. The role of the construction sector in the development of social, economic and infrastructure is very high, providing great support for the development of other sectors of the economy through both backward and forward linkages. Malaysia's construction sector is a major productive sector and plays a key role in the Malaysian economy.

Malaysia has recognised the importance of the construction sector since the early years of its independence not only for economic development, but also for improving the standard of living and quality of life for its people. Malaysia began its building boom in the early 1990s, just after the government announced Vision 2020 (Kamal et al., 2012). Malaysia's construction sector is now a major productive sector of the Malaysian economy. It is more sophisticated, modernised and well-equipped. It has the ability to produce complex heavy infrastructure and skyscraper projects using highly advanced mechanised techniques. This has contributed to rapid implementation of many initiatives, such as high-rise commercial and industrial buildings, highways, expressways, bridges and tunnels, housing schemes, schools and hospitals, and leisure and spa centres, monorail and mass transit rail networks, and power plants. Building and civil engineering firms therefore need different

types of efficiently controlled assets in a specific combination to carry out their primary (core) project efficiently and profitably. The asset management of each contracting company defines how effective the overall output of its assets can be handled in a dynamic and highly competitive industry, such as the construction industry. As a result, it allows a firm ensuring that all assets, particularly non-current assets, are used efficiently and avoid excessive or undue additional costs, such as excess costs or inefficiency.

1.1.1 Background of Malaysian Construction Industry

The asset management of each contracting business specifies how the performance level of their assets can be managed effectively in a complex and highly competitive industry such as the construction industry. As a result, it helps a firm ensure that all assets, especially non-current assets, are used efficiently and avoid unnecessary or undue additional costs, such as waste costs or inefficiency. For example, the construction industry in Malaysia provides employment opportunities for some 800,000 workers, particularly semi-and unskilled workers (CIDB, 2017). The sector also has a ripple effect on other sectors, such as manufacturing, financial and other professional services.

1.1.1.1 Number and Value of Projects Awarded by Public and Private Sector

Table 1.1 shows the total number of construction projects awarded by public and private sector reports from 2011 to 2017. In 2013, the number of projects awarded indicates the highest number of projects, 8,199. In 2017, the number of projects awarded declined by 9.5 percent to 7,548 projects (2016: 7,944 projects). In terms of sector, the private sector secured 72.2 percent (5,449 projects) compared to 27.8 percent (2,099 projects) by the

government sector. This decrease is the lowest for the entire seven years in terms of the number of projects.

Table 1.1: Total Number of Projects Awarded by Public and Private Sector

Sector	2011	2012	2013	2014	2015	2016	2017
Public	1,954	2,001	1,971	1,800	1,902	2,097	2,099
Private	5,771	5,997	6,228	6,276	5,653	5,847	5,449
Total	7,725	7,998	8,199	8,076	7,555	7,944	7,548

Source: CIDB Annual Report (2017)

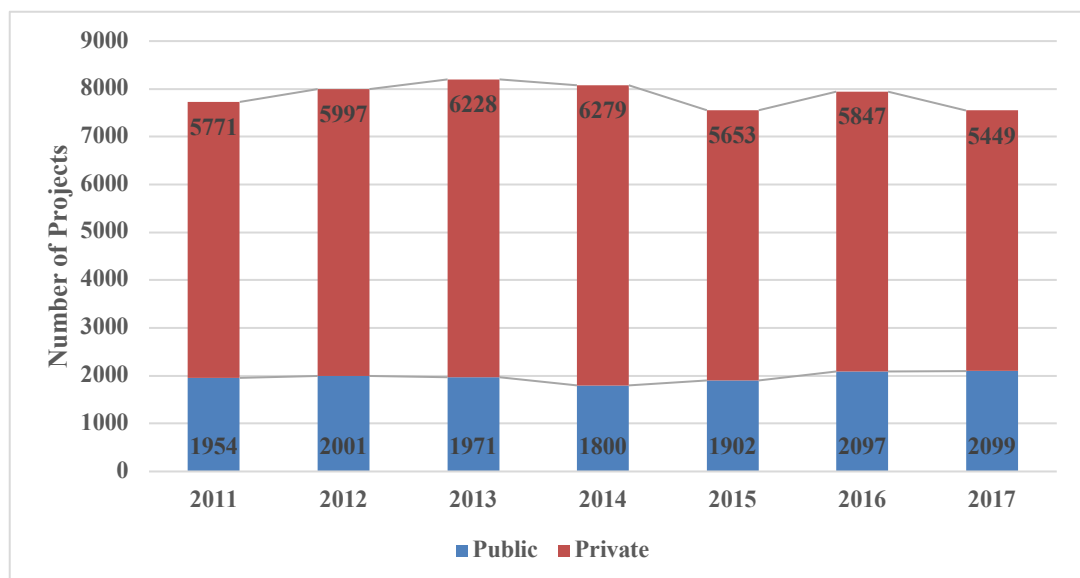


Figure 1.1: Number of Projects Awarded by Public and Private Sector

Source: CIDB Annual Report (2017)

From the sorted overall bar heights in Figure 1.1, private sector appears to have higher number of projects than the public sector due to the adaptation of Public Private Partnership (PPP) privatisation programmes. In particular, the government continues to play a significant role as a guarantor of loans contracted from the private sector (Naidu & Lee,

1997) in the form of soft loans, direct loans from banks and provision funds, and in the form of financial aid (Baietti, 2001).

Table 1.2 lists projects that have been granted to the main contractor worth RM500,000 or more. In 2016, construction projects increased their value to RM 252 billion in 2016 by 77.5 percent (2015: RM 142 billion). The private sector has an overall valuation of 79 percent (RM200 billion) of the construction projects; compared to the government sector at 21 percent (RM52 billion). Overall, 2017 shows a decline in both the number and value of construction projects awarded to the construction firms in Malaysia.

Table 1.2: Total Value of Projects Awarded by Public and Private Sector (RM billion)

Sector	2011	2012	2013	2014	2015	2016	2017
Public	23	19	23	24	25	52	42
Private	79	112	114	161	117	200	121
Total	102	131	137	185	142	252	163

Source: CIDB Annual Report (2017)

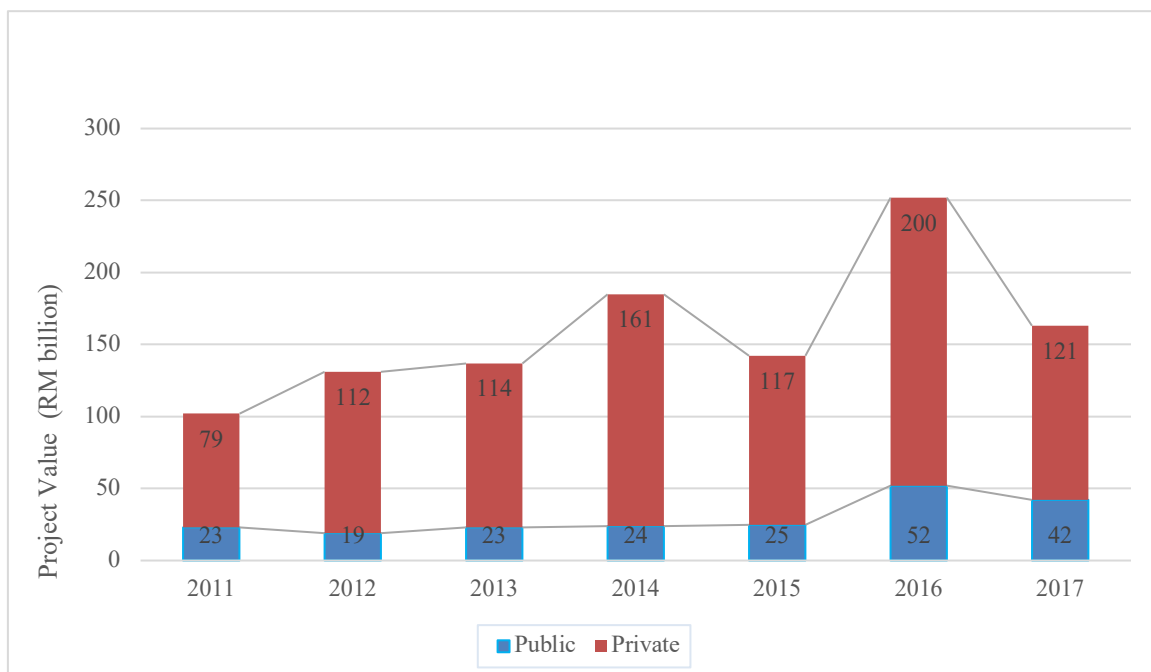


Figure 1.2: Value of Projects Awarded by Public and Private Sector

Source: CIDB Annual Report (2017)

The stacked bar chart in Figure 1.2 depicts the value of projects awarded to public sector appears to have a lower proportion than the value of projects awarded to private sector. This have an immense impact on Industrialised Building System (IBS) adoption since the bulk of development is by the private sector and Majlis Negara Kerajaan Tempatan (MNKT) has agreed to approve the policy of mandating IBS adoption for projects costing above than RM50m (CIDB Annual Report, 2017).

1.1.1.2 Number and Value of Projects Awarded by Category

Table 1.3 highlights that large portion of construction works came from the infrastructure projects, followed by non-residential projects, residential projects, and social amenities projects throughout 2011 to 2017 period. Table 1.3 shows the number of projects awarded indicates the highest number of projects, 8,199. This is mainly contributed by the number of projects awarded on non-residential projects, followed by residential projects, infrastructure and social amenities projects. However, the number of projects awarded in 2017 declined in all categories and this decline in the number of projects is the lowest for the whole seven years period due to the economic uncertainties experienced in Malaysia.

Table 1.3: Number of Projects Awarded by Category

Sector	2011	2012	2013	2014	2015	2016	2017
Residential	2,253	2,307	2,365	2,321	2,096	2,120	1,992
Non-Residential	2,661	2,884	3,075	3,019	2,697	2,775	2,651
Social Amenities	820	918	731	702	727	876	821
Infrastructure	1,991	1,889	2,028	2,034	2,035	2,173	2,084
Total	7,725	7,998	8,199	8,076	7,555	7,944	7,548

Source: CIDB Annual Report (2017)

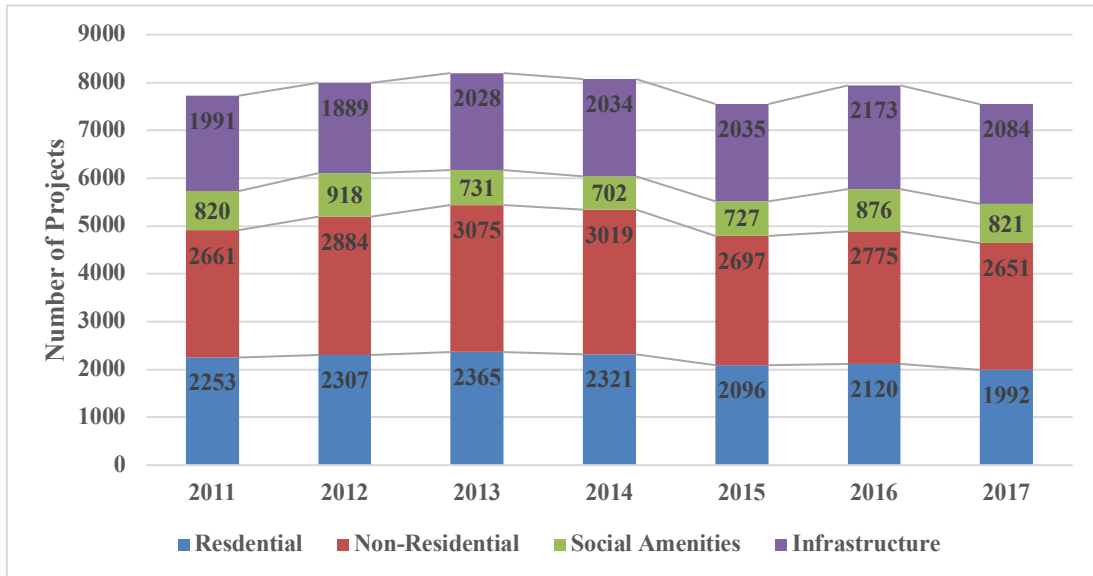


Figure 1.3: Number of Projects Awarded by Category

Source: CIDB Annual Report (2017)

The bar chart in Figure 1.3 gives information that non-residential sector has the largest portion in terms of number of projects for the seven years, 2011 to 2017 and the highest portion is in 2013. The residential sector has a consistent trend compared to the infrastructure and social amenities sectors. If this trend continues, we can expect that the non-residential and residential sector to grow giving rise to positive growth for construction sector in Malaysia.

Table 1.4 indicates that 2016 recorded the highest value of construction projects from in comparison from 2011 to 2017. In terms of category value, the infrastructure sector commands the highest value, RM141 billion, compared to residential, RM49 billion, non-residential, RM53 billion and social amenities, RM9 billion. However, the value of project for infrastructure sector dropped by 66 percent to RM48 billion in 2017 (2016: RM141 billion) in 2017. The value of project for residential sector decreased by 4.1 percent to RM47 billion in 2017 (2016: RM49 billion). On the other hand, both non-residential and social amenities seemed to increase by 9.4 percent to RM58 billion (2016: RM53 billion) and 11.1 percent to RM10 billion (2016: RM9 billion) respectively.

Table 1.4: Value of Projects Awarded by Category (RM Billion)

Sector	2011	2012	2013	2014	2015	2016	2017
Residential	25	34	39	37	54	49	47
Non-Residential	37	44	55	96	54	53	58
Social Amenities	7	7	10	8	5	9	10
Infrastructure	33	46	33	44	24	141	48
Total	102	131	137	185	137	252	163

Source: CIDB Annual Report (2017)

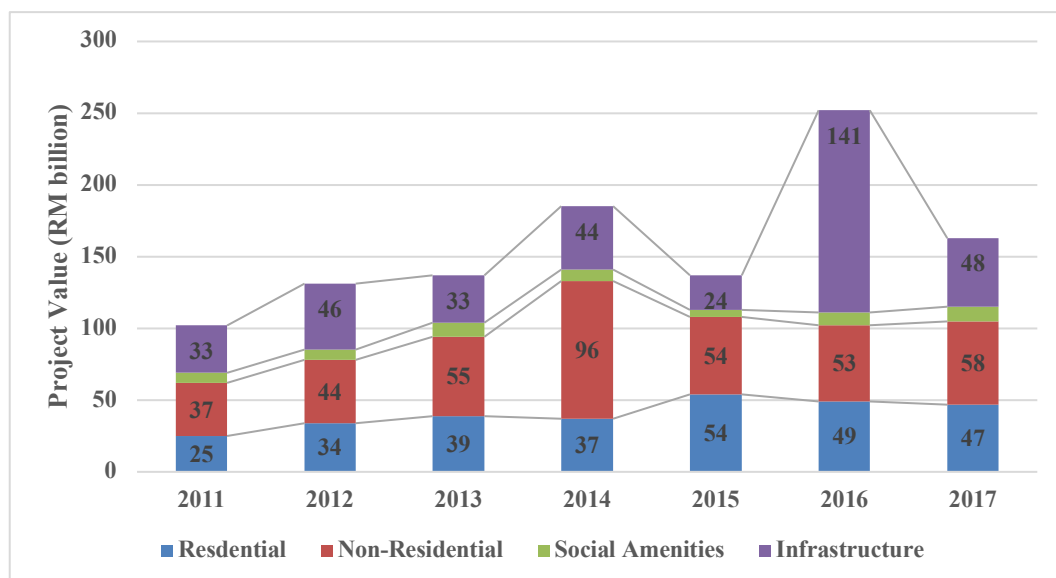


Figure 1.4: Value of Projects Awarded by Category (RM Billion)

Source: CIDB Annual Report (2017)

In Figure 1.4, in 2016 more than half portion of construction works came from the infrastructure projects at 56 percent (RM141 billion); followed by non-residential projects at 21 percent (RM53 billion); residential projects at 19 percent (RM49 billion); and social amenities projects at 4 percent (RM9 billion). Figure 1.3 signifies that a total of 70 percent (RM40.7 billion) of the infrastructure projects were driven by the private sector, due to the high-value projects under the transportation and utilities segments (CIDB, 2017). A total of

RM163 billion worth of projects and 7,548 projects were recorded as of 2017. In terms of value, the private and government sector each had a share of 74 percent (RM121 billion) and 26 percent (RM42 billion) worth of projects.

The major impact on Malaysian construction projects came from the implementation of 24 major projects costing more than RM1.0 billion each. These projects account for RM109.9 billion in 2016 (CIDB, 2017). The 5 largest projects are shown in Table 1.5:

Table 1.5: Partial list of major government projects 2010-2016

Major Government Project	Award	Expected Completion
East Coast Rail Link from Port Klang, Selangor to Wakaf Bahru, Kelantan	November 2016	2024
Mass Rapid Transit Sungai Buloh – Serdang – Putrajaya Line (Jalan Ipoh North Escape Shaft to Desa Waterpark South Portal) in Klang Valley	March 2016	2021
Electrified Double Track (Gemas to Johor Bahru) in Johor	October 2016	2022
1,800MW to 2,400MW Combined Cycle Gas Turbine Power Plant in Alor Gajah, Melaka	November 2016	2021
Setiawangsa – Pantai Expressway in Kuala Lumpur	November 2016	2020

Source: CIDB Malaysia (2017)

1.1.1.3 Gross Domestic Product (GDP) by Economic Activities

Table 1.6 indicates the gross domestic product (GDP) by kind of economic activities in Malaysia. The activities among others are agriculture, mining, and quarrying,

manufacturing, and services. Figure 1.5 and Figure 1.6 translate the value and percentage annual change of the indicators in Table 1.5 to have a clearer understanding of the trends.

Table 1.6: Gross Domestic Product by Kind of Economic Activities

Gross Domestic Product by Kind of Economic Activities-in RM million									
	2009	2010	2011	2012	2013	2014	2015	2016	2017
	RM million								
<i>Agriculture</i>	50,063	51,263	54,253	54,782	91,181	93,048	94,249	89,465	95,894
<i>Mining and quarrying</i>	66,386	66,182	62,565	63,432	87,789	90,707	95,508	97,563	98,596
<i>Manufacturing</i>	152,150	170,261	178,237	186,748	219,152	232,527	243,903	254,725	269,966
<i>Construction</i>	19,270	21,459	22,464	26,531	38,590	43,115	46,630	50,103	53,443
<i>Services</i>	335,024	359,829	385,179	409,976	507,791	541,412	569,258	601,341	638,752
	Annual Change (%)								
<i>Agriculture</i>	0.1	2.4	5.8	1.0	2.0	2.0	1.3	-5.1	7.2
<i>Mining and quarrying</i>	-6.5	-0.3	-5.5	1.4	1.2	3.3	5.3	2.2	1.1
<i>Manufacturing</i>	-9.0	11.9	4.7	4.8	3.4	6.1	4.9	4.4	6.0
<i>Construction</i>	6.2	11.4	4.7	18.1	10.6	11.7	8.2	7.4	6.7
<i>Services</i>	2.9	7.4	7.0	6.4	5.9	6.6	5.1	5.6	6.2

Source: Bank Negara Malaysia (2017)

The construction sector grew by 5.1 percent in 2010 (2009: 5.9 percent). Growth was supported mainly by the non-residential subsector, reflecting the construction of commercial properties and the upgrading and repair of public buildings. The civil engineering sub-sector continued to expand reflecting further progress in the implementation of infrastructure projects.

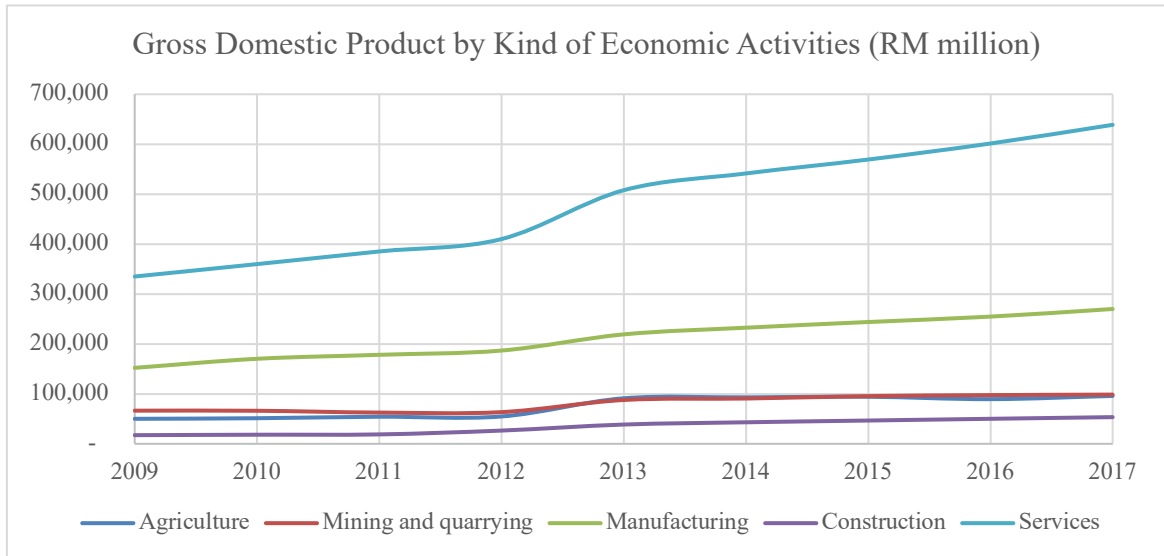


Figure 1.5: Gross Domestic Product by Kind of Economic Activities in RM million

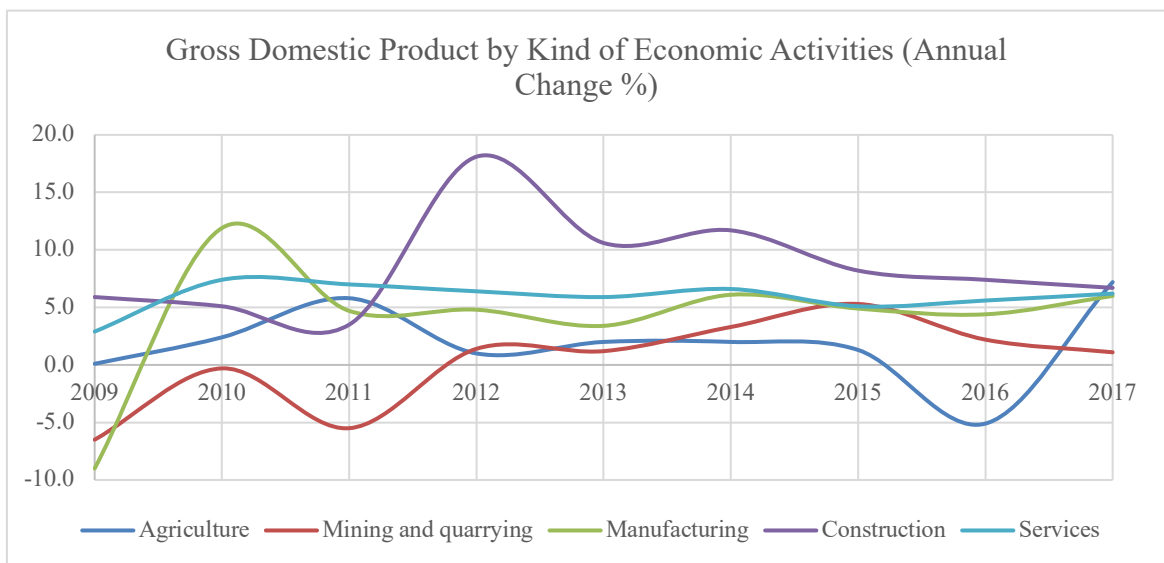


Figure 1.6: GDP by Kind of Economic Activities in Annual Change %

Construction activity in the residential sub-sector declined, as fewer units of new residential properties were launched by developers, especially in the early part of 2010. Meanwhile, house prices increased by 6 percent on an annual basis during the first three quarters of 2010, almost twice the size of the average increase of 3.4 percent during 2000-2009. The construction sector expanded at a moderate rate of 3.5 percent in 2011 (2010: 5.1

percent), following slower activity in the civil engineering and non-residential sub-sectors. The civil engineering and special trade sub-sector registered a slower growth, especially in the second quarter, following the completion of major highway projects, and maintenance and upgrading work under the second stimulus package.

In 2012, the construction sector recorded a robust growth of 18.1 percent, the highest since 1995 (21.1 percent), driven mainly by the civil engineering sub-sector. This reflected the efforts to improve road and rail accessibility, enhance electricity generation capacity, and increase oil and gas output in Malaysia. Compared to the rapid growth in 1995, existing major projects are more broad-based in terms of sector and geographical location, covering areas beyond the Klang Valley (see Table 1.6). The strong growth was reflected in higher construction-related financing, manufacturing sales, and production activity in 2012 (see Figure 1.5). Growth in the sector was also contributed by the residential and non-residential sub-sectors. The performance of the residential sub-sector was underpinned by the construction of high-end properties in the Klang Valley, Penang, and Johor, following robust launches in 2010 and 2011 (see Table 1.7). Industrial projects in the Samalaju Industrial Park, tourism projects in Iskandar, and commercial projects in the Klang Valley supported growth in the non-residential sub-sector. Construction of learning and health institutions, such as the Universiti Teknologi MARA campuses and National Cancer Institute, also provided further impetus to this sub-sector. These major projects have created tremendous contracting job opportunities for various construction firms in Malaysia including some of the construction firms listed in Bursa Malaysia.

In 2013, growth remained strong in the construction sector (10.6 percent; 2012:18.1 percent), owing to robust activity in the residential and civil engineering sub-sectors. Growth in the residential sub-sector was underpinned by the construction of high-end and high-rise

properties in the Klang Valley, Penang, and Johor. In the civil-engineering sub-sector, activities in infrastructure, and oil and gas-related projects supported growth. Notable projects included Tanjung Bin and Janamanjung power plants, MRT, Sabah Oil & Gas Terminal, Sabah-Sarawak Gas Pipeline, and the Keabangan Oil and Gas project.

Table 1.7: Major Projects by Location

Sector	Projects	Location
Transport	MRT (Sungai Buloh-Kajang)	Klang Valley
	LRT Extension	Klang Valley
	KLIA2	Klang Valley
	Second Penang Bridge	Penang
	Seremban - Gemas Double Track	Negeri Sembilan
	Rural Road Programme	Various State
Utilities	Janamanjung Power Plant	Perak
	Tanjung Bin Power Plant	Johor
	Pahang - Selangor Raw Water Transfer	Pahang & Selangor
Oil & Gas	Melaka LNG Regasification Terminal	Melaka
	Sabah - Sarawak Gas Pipeline	Sabah & Sarawak
	Sabah Oil & Gas Terminal	Sabah
	Gumusut - Kakap Deepwater Project	Sabah

Source: News Flows and Budget, Bank Negara Malaysia (2012)

The construction sector registered a higher growth of 11.7 percent during the year 2014 (2013: 10.6 percent), owing mainly to stronger growth in both the residential and non-

residential sub-sectors. The robust growth in the residential sub-sector was attributed to continued progress in high-end housing projects in Johor, Klang Valley, and Penang, while construction activities in the non-residential sub-sector were supported by commercial and industrial projects. The civil engineering sub-sector provided further support to the sector, underpinned by existing and new infrastructure projects.

The construction sector grew at a moderate pace in 2015 (8.2 percent; 2014: 11.7 percent), due mainly to the slower growth in the residential sub-sector. Construction activity in the residential sub-sector was affected by fewer property launches during the year. Nonetheless, growth in the civil engineering sub-sector picked up, reflecting the progress of existing infrastructure projects as well as the commencement of a large petrochemical project in Johor. Growth in the construction sector was also supported by the non-residential sub-sector, which was underpinned by projects in both the industrial and commercial property segments.

The construction sector recorded moderate growth in 2016 (7.4 percent; 2015: 8.2 percent). The faster pace of expansion in the civil engineering and residential sub-sectors was partially offset by a decline in non-residential activity. Growth in the civil engineering sub-sector was driven by higher activity in existing multi-year projects, particularly in the petrochemical, transportation, and utility segments. Activity in the residential sub-sector was supported by large property launches in the previous years while growth in the special trade sub-sector continued to be supported by early and end-works activity. Growth in the non-residential sub-sector, however, was weighed down by slower activity in the commercial property segment amid the oversupply of office and retail space.

The construction sector registered a moderate growth of 6.7 percent in 2017 (2016: 7.4 percent). Growth was supported mainly by the civil engineering sub-sector, due to the

steady progress of large petrochemical, transportation, and utility projects. The special trade sub-sector benefited from increased activity from projects in the early stages of construction, such as land clearing, piling, and land reclamation work. Growth in the residential sub-sector moderated, consistent with the record-high number of unsold residential properties. In the non-residential sub-sector, growth was sustained by higher activity from mixed developments, industrial and social projects such as theme parks and sports complexes, which was offset by the ongoing weakness in the commercial segment due to an oversupply of office space and shopping complexes.

In conclusion, the landscape overview of the construction sector in Malaysia from 2010 to 2017 shows that the number and value of projects awarded to the private sector are larger than the government sector and infrastructure category has the highest portion against the other three categories. In terms of GDP, although the construction sector shows the lowest contribution to Malaysia's economy compared to other sectors like agriculture, mining and quarrying, manufacturing, and services, the annual change is consistent and highest among the other sectors. This implies that Malaysia's construction industry persisted promising and showed positive growth in the competition worldwide.

1.1.2 Assets structure in the Construction Firms

Assets are owned and used by firms to achieve corporate and operational goals. There are various types of properties, and depending on the numerous variables such as size, turnover, age, operational nature and market climate which could be managed in different magnitudes. This section discusses the common types of assets in construction firms, i.e. current and non-current assets. Robins (1999) points out that asset classification into non-current or current assets would depend on the function of an organization and not on the type of organization, and shows three guidelines for classifying assets as non-current assets when

held i.e. for use in the production and provision of goods and services; for rental for other purposes; for management purposes continuously for reporting activities to the organization. If these criteria are not met, the assets are classified as current assets. The concept of current assets in Weston and Copeland (1989) is cash, marketable securities, progressive jobs, account receivables and inventories intended to turn them into cash over a period of one year. Therefore, they are usually called liquid assets and used to quantify firms' level of liquidity. Some of these do not, however, quickly become cash within a year, as is experienced with prolonged delays when collecting account receivables within the construction industry. In light of this, non-current assets include buildings, plants and equipment that will not be turned into cash in a year and used in production processes routinely or continuously for more than a year.

Assets also are known as tangible and intangible assets (examples of goodwill, shares or investments of other businesses) (Weston & Copeland, 1989). The financial statements are generally used to contain these two categories of assets (non-current and current), in the firms' Statement of Financial Position; the main emphasis of this study. Firms normally integrates various types of assets to operate successfully and giving returns to the stakeholders.

Business contracting processes include the highly complex linkage of tasks requiring the acquisition and coordination of diverse skill categories (Groak, 1992). Personnel resources (skilled and managed personnel) are essential for contractors to achieve business success. Cannon and Hillebrandt (1989) argued that management expertise is the scarce resource (asset) which limits their business development. Kale and Arditi (2001) noted that the good partnership between the general contractors and the subcontractors is a winning strategy that could have a significant impact and economic results on their operations.

Hence, having a strong partnership with various categories of professional subcontractors may also help to reduce the pressure of a large workforce, despite the fluctuating workload for contractors. According to Svendsen et al. (2001), the relationships that exist between employees and other stakeholders through intangible assets is vital inside the knowledge-based economy and assert that these assets distinguishes one firm from another. These relationship networks are bolstered by innovations in technology and globalization and are a key business asset. The satisfaction of employees has been identified as a proven intangible asset of business value. Kale and Arditi (2001) describe the relationship between the industry as a high industry in terms of human capital resources. This is clearly not a thorough assessment of the types of assets employed by contracting businesses and the common ones have been highlighted for ambiguity purposes here. The asset structure of a firm is referred to the fixed asset ratio on the total assets. It is quantified as the proportion of non-current assets divided by the total assets (the numbers are taken from the financial statements). The ratio also indicates the number of assets could be made available as collateral, also alluded as the tangibility of the assets of the firm.

In contrast, current assets are generally liquid or high liquidity and sometimes retained in the accounts receivable by contractors and could not be readily available during the accounting period (Olateju, 1992). As a result, creditors often rely on the level of non-current assets in the firm's total assets for their decisions. Like any other businesses, construction firms also involve some amount of investments in non-current or physical assets, apart from current assets that could easily be changed or funds for use. The level of non-current assets available and required depends on the extent of the activities of the firms, and this may clout their ability to acquire additional financing as the tangible assets can be used as collateral against the financial obligations acquired in the event of a financial failure

(Chiang et al., 2002); i.e. the collateral acts in reducing the risk of severe losses to the borrowers. Assets tangibility and debt to total assets was examined in evaluating the debt capacity of the construction firms and the likelihood of debt recovery from their existing assets, should a failure occur and the amount secured by the creditors.

1.2 Problem Statement

The nature of the construction industry harshly described contractors is beset with challenges and problems in delivering the construction projects in a timely manner, minimal budgetary costs, and fulfil the essential quality requirements set by their sector clients (Muir, 2005; Owolabi et al., 2014). Reviews by previous scholars and practitioners on the challenges facing the construction industry internationally was mated with the importance of managing NCA as it is acquired in gaining future probable economic benefits controlled by entities from a past events (Malaysian Financial Reporting Standards (MFRS) 116) for this study due to the consequences if NCA are not properly managed. The increased rate of failure and poor performance of contractors in the sector are triggered by the minimal investment in non-current assets, i.e. the collateral used in settling financing obligation during crisis (Cannon & Hillebrandt, 1989; Chiang et al., 2002). Ofori (2000) mentioned that the underinvestment of non-current assets by contractors was due to the effect of globalisation and advancements in technology in the changing economic environment. Langford et al. (1993) argued that the decline in manufacturing productions is mainly caused by the increase of competition for employment to the extent in deflating the sector. According to Kenley (1999), this scenario is "cash farming," in which contractors redirect surplus money generated from positive cash flow to non-related businesses with short working capital cycles. This is regarded as a "cash-hungry" business (Cannon & Hillebrandt, 1989). For the Malaysian construction industry (MCI), gaps have always been highlighted

in various literature reviews in the local or and international journals, conferences, and conventions. Based on the local study it could be summed up that MCI was full of delays in the approval of projects, incomplete projects, cost overruns, late payment to contractors, poor quality of work resulting in the negative reputation of the firms in the industry, lack of training and sluggish implementation of technology.

Studies by Abdul Rahman et al. (2006), Abdul-Rahman and Alidrisyi (1994), BIPC/CIDB (2003), Hamzah (2003), Imtiaz and Ibrahim (2005) and Pratt (2000) highlighted issues on MCI and found that 45.9 percent of project delays occurred during the construction process to reach the completion dates. Such delays resulted in the accumulated losses to the purchasers and developers as the sector gives a huge impact towards the growth of the country's economy.

Pratt (2000) stated that Malaysian projects during the last decade were not cost and functionally effective, particularly the magnificent monuments. He emphasized in several cases budget was surpassed, estimated accomplishment dates were not met and output not frequently meet the standards. Similarly, Abdul-Rahman and Alidrisyi (1994) view that the late delivery of material at construction sites caused delay in the execution of the projects resulting in the excess of materials on construction sites after completion of the project. Ironically, since the end of 2004, major renovation projects have faced difficulties such as delays in delivering projects and cost inflation, and the structural deficiencies in school buildings and community college buildings said to be found. PMCs, which oversee and manage government projects, have struggled to regulate the outlays, scope and design of such projects, ending up in escalated costs.

Second, local studies by Endut et al. (2009) and Rahman et al. (2013) concluded that Malaysian construction firms faced huge cost overruns in projects due to the ineffective

management, including poor material control, poor site management and poor cash management which have caused a bad image to the industry. The Construction Industry Development Board (CIDB) Master Plan for Occupational Safety and Health (CIDB Master Plan OSHA, 2004) highlighted significant issues related to quality, productivity, image, economic instability, delays, labour shortages, insufficient data and poor knowledge. Low productivity in the industry is attributed by the low technology used, poor project and site management, employment of unskilled labour, high input and length projections, manpower shortages, high construction waste, inadequate maintenance, non-conducive and disaster-prone conditions. This had dented the image of the industry due to high number of accidents at site, the absence of job security, poor management, and high risks jobs with low wages and poor opportunity in job progress.

Third, another weak point of the industry is the lack of organised and structured training and skills training in the field. Unlike other sectors, construction has seen little or no change in efficiency over the last eight decades. Ameh et al. (2010), Frimpong et al. (2003) and Shehu et al. (2014) pointed out that the poor skills in communicating with relevant parties, technical know-how especially on the site has not improved as contractors are still using the methods used in the earlier construction era, as contractors based on their experiences rather than learning formally. Frequently the Malaysian contractors deal with “contracting construction”, thus the element of expertise, technical know-how, communication are extremely critical in warranting the success of a project as highlighted by Wong (1991) that the honorary advisor to the Master Builders Association Malaysia (MBAM), admitted that the physical implementation of development projects were only recommended for formal education and training just under two decades ago.

This confrontational condition creates a massive imbalance between those planning, designing (the architectural and engineering), taking off amounts and preparing paperwork (the consultants), and those organizing, implementing, and executing building improvement projects (the contractors). These contractors often struggle to build training and continuing professional development into their working life because of funding and time constraints. In order to turn Malaysia into a new and prosperous country in the future, the local construction industry needs extensive evolution in its growth and maturity. The old construction management practices need to be drastically revamped to meet exacting building performance requirements. The most common construction jargon, i.e. “budget and schedule” can then be replaced by “strategy and planning”. This signifies that modern construction management practices are trying to incorporate strategic planning principles in the long run rather than their conventional methods for short-term project planning. Therefore, in tackling the current skills gap, the much-needed training initiatives help management to perform efficiently and effectively on the whole job process. This in turn would lead to fewer mistakes and accidents occurring on-site to meet the completion dates in construction contracts. As a result, the firms could reduce costs, increase turnover and productivity, and focus to plan for change and growth.

Lastly, Ameh et al. (2010) and Shehu et al. (2013) discovered that the entire construction industry is notoriously slow to adopt the emergence of new technologies. Throughout the years, numerous surveys and studies have shown that business owners tend to underinvest in technology, despite their acknowledgment of the advantages of technology advancement to run their business and handle construction projects. In Malaysia, CIDB in collaboration with Building Industry Presidents’ Council (BIPC) held a roundtable discussion in June 2003 with the president’s and chief executive officers of the MCI

specifically to discuss establishing priorities to improve the MCI for the future. Productivity and efficiency were amongst the 10 priorities listed and recommended for change. CIDB has suggested that the construction industry use automation, prefabricated products, new construction methods and techniques, and industrialisation, etc. to improve operational performance and the bad image of the industry. Similarly, Abdul Rahman et al. (2005) and Zaini (2000), stressed that, despite the dramatic rate of growth, the Malaysian construction industry has not changed much in terms of technology since the 1960s and still banking on the old building techniques conventions. Construction firms fail to tap the technology benefits, causing firms fail to gain the competitive advantage over local and international competitors.

Considering the above weaknesses and significant gaps in the construction industry of Malaysia, this study intends to fill the conflict of findings in the assets structures of construction firms through investigating mainly on the impact of non-current assets that affects firms' performance. Expectations of a higher quality finish, tighter construction schedules, and the need to remain within budget would require superior construction technologies and techniques. There is no doubt that a significant improvement in quality and efficiency is possible. This is important so that recommendations can be made to enhance the performance of the firms and their survival.

1.3 Objectives of the Study

The general and specific objectives of this study are discussed as follows:

1.3.1 General Objective

The general objective of this study is to examine the impact of firm's non-current assets (NCA) on firms' performance of the construction sector in Malaysia.

1.3.2 Specific Objectives

The above general objective is aimed to be achieved by setting the specific objectives in detail:

- i. To investigate the effect of fixed asset turnover on the performance of firms.
- ii. To examine the relationship between asset tangibility the performance of firms.
- iii. To assess the impacts of total asset turnover on the performance of firms.

1.4 Research Questions

This study raises questions that may help in investigating further the relationship correlation between NCA and profitability for the non-financial sector in Malaysia. The following research questions are asked:

Specifically, there are three research questions that are aimed to be justified through this study which includes:

- i. Does the fixed asset turnover give a significant effect on ROA and ROE?
- ii. Is there any significant influence of asset tangibility on ROA and ROE?
- iii. How does the total asset turnover affect ROA and ROE?

1.5 Significance of the Study

The main purpose of this study is to provide an understanding of the performance of non-current assets and factors affecting the performance of the construction sector in Malaysia. Thus, the study's main contributions include analysing and extending the existing study from a new viewpoint. Firstly, this study extended a significant contribution to the theories i.e. agency theory, trade-offs theory, pecking order theory, stewardship theory, and stakeholder theory. Agency theory established the cost of agency when there is a two-party dispute of concern. Trade-off theory claimed that the firm's costs and benefits are balanced by debt and equity financing. Pecking order theory suggested a firm to use debt financing

first to generate funds and equity is issued as a last option. Stewardship theory has a clear objective of shareholder satisfaction while stakeholder theory states that the firms should operate primarily to consider customers, suppliers, employees, communities, and shareholders. Hence, this work was aimed at inspecting the validity of these hypotheses and devoting the effects of fixed asset turnover, the tangibility of assets, and total asset turnover to the option of debt-equity firms in Malaysia's construction market.

Secondly, knowing the value of non-current assets and how they affect the firms' performance can help governments, policymakers, and other stakeholders develop effective policy, rules, or regulations to promote economic productivity, growth, and stable finance. It makes sure that the interest of shareholders and stakeholders are in the same line and treated fairly and also facilitate the company to involve in long- term investment.

Thirdly, regulatory bodies such as the Department of Occupational Safety and Health (DOSH), a department under the Ministry of Human Resources can use these findings to enhance the framework for ensuring the safety, health, and welfare of people at work as well as protecting other people from the safety and health hazards arising from the activities in the construction sector. Findings from this study would offer critical input for the government in developing and updating policies as well as the development of an asset management framework for more to enhance growth and encouraging automation. This study would also provide handy information for future investors and interested parties keen on contributing their resources, reducing risks in making their investment decisions, and predicting the possible returns gained from the decision.

Finally, interested parties would find the sign on the results of this study and thus providing better insight for making business decisions. Through this study, the management will be able to strategize and optimize the utilisation of their NCA on achieving the desired

profitability, growth, planning, and formation of business strategies, as well as addressing the liquidity challenges and ultimately to avoid firms from possible insolvency. As for academicians, this study would provide in-depth information by providing important materials and sources for future study in the related area.

1.6 Organization of the Study

The analysis of the factors influencing a firm's performance in Malaysia serves as the primary aim of this study. In order to conduct and complete this study, the data set of this study strictly uses secondary data from annual reports and accounts of the industrial and construction sectors quoted in Bursa Malaysia for the period of 2011 to 2017. This study is structured into five chapters.

Chapter 1 provides the definition, terminology, and concepts pertaining to the non-current assets, as well as its importance towards businesses world-wide and in Malaysia specifically. This chapter also touches on the purpose of this study by elaborating on the reasons, rationale, importance, and gap identified that acts as a guide for this study.

Chapter 2 exhibits the literature reviews and evaluation from prior studies on the subject matter covering the relevant elements involved in the study i.e. non-current assets and firms' performance represented by ROA and ROE.

The following chapter, Chapter 3, discussed the theoretical framework, data descriptions, and further describing the methods used throughout this study in analysing the correlation between the variables.

Chapter 4 further discuss the study's empirical model, the discoveries of the study and outcomes subsequent to the analytical tests on data in demonstrating the accurateness of the model stated and provides the wrap-up on every single correlation involving the variables.

Lastly, Chapter 5 acts as a medium in justifying the relationship between the independent, dependant, and control variables, and providing answers to the questions raised in Chapter 1 earlier. This chapter also includes policy implementations by providing study limitations and future suggestions for future study. Finally, this study is aimed to offer evidence on factors in the NCA influencing the ROA and ROE, proxies for firms' performance.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter review the previous research studies done by the earlier researchers regarding the concepts and theories to identify the association between the NCA and firms' performance for construction sector in Malaysia. This literature review makes interpretations and evaluation on the body of the literature relevant to fixed asset turnover, asset tangibility, total asset turnover, firms' size and financial leverage on firm's performance i.e. return on asset and return on equity by summarizing the previous researches result and findings. Generally, profitability is the primary goal of all business ventures. A highly profitable business has the ability to reward its owners with a large return on their investment and only efficient firms stay in the market longer. The less productive firms will eventually exit the market (Jovanovic, 1982). Without profitability, it is said that the business's survival period is shorter. Therefore, by measuring the current and past performance of the firms, the business is actually projecting the future profitability to survive in the long-run.

Chapter 2 has five sections. This Section defined a short brief about this chapter. Section 2.2 presented the determinants of NCA and financial performance. Section 2.3 list the theoretical framework, discussed several major theories related to this research. Section 2.4, summarise the whole of discussion in this chapter and lastly followed by the closing remark.

2.2 Asset Management Efficiency and Firms' Performance

Assets have significant function to determine the profitability of a firm and is the crucial elements to determine the profit ratio (Smith, 1980). MFRS 116 states that assets are the probable future economic benefits obtained or controlled by a particular entity as a result

of past transaction or events. There are various kind of reasons why the study of assets is considered to be the most important exercise to a firm. In principle, there are two types of assets in the commercial firms which is current asset and non-current assets as shown in Figure 2.1. The current assets are short-term assets. These resources are expected to be used to benefit a company within a year (twelve months' period) or the current accounting period. Common examples of current asset are cash, inventory, account receivables and prepaid expenses. Undeniable, these assets are the life blood of every firm (Flanagan, 2005). However, for the purpose of this research study, the focus is on NCA. Therefore, current assets will not be described in detail. Lzryadnova (2013) stated that the investments in NCA at large and medium-sized firms in Oman exceeds 90 percent for the investments amount proves that the acquisition of NCA involves high capital outlay. Iqbal and Mati (2012) stated that efficient organization of NCA is the core segment of the entire firm and initiate the value of shareholders.

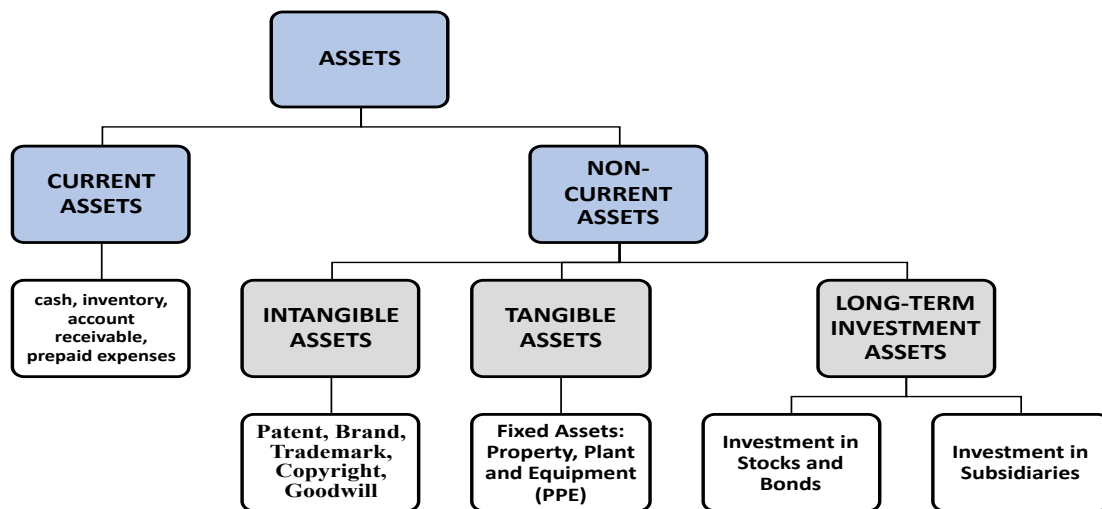


Figure 2.1: Types of Assets: Current Assets and Non-Current Assets

2.2.1 Non-Current Assets (NCA)

This research study mainly aims to answer whether the management of NCA affects the financial performance of a firm. The importance of managing NCA is efficiency. Poor utilization of NCA can cause low return on investment. Low return on investment reflect ineffectiveness and inefficiency of utilization of assets. This inadequate NCA efficiency resulting in low productive activities as NCA act as the business structure (Aquino, 2010). Figure 2.1 further breakdown the NCA into intangible assets, tangible assets and long-term investments. These assets are all included under NCA. The risk involved in NCA is higher than the current assets. Intangible assets have no physical in nature. Instead, firms can create or acquire these intangible assets like patents, brands, trademarks, copyrights and goodwill. In contrast, tangible assets that are constantly needed for the production or sale of goods or services are termed as non-current assets. In business, non-current assets are most often referred to as property, plant, and equipment (PPE). PPE is categorized as tangible asset because the physical existence of the assets can be seen and touch.

According to Kantudu (2008) and Nguyen (2019), the tremendous growth in non-current assets is said to increase in the profitability because the utilization of these assets means more products and sales as most of industries in the mining sector and construction sector have a massive growth in non-current assets. These kinds of assets indicate the ability of a firm to survive and compete with other firms (Reyhani, 2012). Further, long-term investment assets such as stocks and bonds and represent the firm's investments on assets that a company intends to hold for more than a fiscal year. In other words, these kinds of assets do not change frequently. Despite of these characteristics, the NCA generates more revenue than the current assets (Scott, 2003).

2.2.2 Firms' Performance

Financial performance is a commonly used yardstick in determining the effectiveness of firms in utilising their assets in ploughing returns. The financial performance would provide instant picture on the health of firms, thus enabling users to make decisions based on the comparison within the firm, sector, industries and trends. Thus, financial performance is actually the accomplishment achieved by firms after taking into consideration the firm's strategies, policies and operations executed by the executives and employees in a certain period. Waggoner et al. (1999), mentioned that by carrying out firms' performance measurement, significant invaluable information would be gathered and useful in monitoring performance, planning, reporting, decision making and problem solving.

Earlier, Lebas (1995) concluded that performance management enables users to create basic calculations for communicating and actions. Various accounting-based method have been introduced in measuring the financial performance, such as return of assets (ROA), return on equity (ROE), earnings per share (EPS), profit margin (PM), expense to assets (ETA) and etc. From previous literature, accounting based performance indicators ROA and ROE are widely used financial ratios by interested parties to measure firm profitability and efficient resources management (Masadeh et al., 2015). The result also advocates the study done by Al-Matari et al. (2014) and Kangarlouei et al. (2012) on the choice of measuring performance and efficiency of managing resources, i.e. via ROA and ROE.

2.2.2.1 Return on Assets (ROA)

This ratio is calculated as net profit after tax divided by the total assets. This ratio measure for the operating efficiency for the company based on the firm's generated profits from its total assets. According to, Abor (2007), Ahmad et al. (2017) and Gill et al. (2011);

ROA is determined by dividing the firm's net profit over the total assets. Narware (2010) and Samiloglu et al. (2017) denotes that ROA describes how well the firm management is using its assets and resources in generating revenue. Klapper and Love (2002), opined that ROA scales the operation levels and financial results of organisations. Haniffa and Hudaib (2006) and Ibrahim and Samad (2011), added that greater ratio of ROA indicates the optimisation in utilising assets and aiding in fulfilling the financial interest of the owners. Al-Matari et al. (2014) discovered that the preferred accounting based performance is led by selecting ROA with 46 percent, followed by ROE 27 percent, PM 8 percent, EPS 5 percent and others, thus, insinuates that ROA is preferred as the ratio shows the utilisation of assets towards generating revenues, enabling users to identify issues and solutions on available resources in achieving organisation goals. Hagel et al. (2013) mentioned the in long run, ROA exposes the effectiveness of firms over time exploiting possible business openings in the uncertain modern market. In other words, ROA is the best financial scorecard indicating organisations health and gauges the outcome of decisions made by executives as it gauges the ability of assets in generating returns. Mauboussin (2012), mentioned that quite a number of organisations opted in using EPS and ROE as a performance indicator, combining it with the revenue amount and growth in publicising to the users of financial data. However, it was discovered that most of the organisations focused on the delivery of short-term yield and prepared to relinquish the long-term gains, thus organisations choose to deliver equity growth rather than on the probable value creation.

2.2.2.2 Return on Equity (ROE)

This ratio is calculated as net profit after tax divided by the total shareholders' equity. This ratio measures the shareholders rate of return on their investment in the company. Earlier, Hagel et al. (2010), discovered that firms may maintain a handsome ROE by hiding

the weakening performance through smart financial strategies. Utilisation of accumulated cash in addressing the increasing debt leverage and share buybacks enables firms to sustain firms ROE despite of dwindling operational gains. Abor (2007) and Ahmad et al. (2017) determine ROE by dividing the earnings before tax and interest over the equity. Batchimeg (2017), Samiloglu et al. (2017) and Wu (2014) explained that ROE is a ratio used in indicating the profitability generated by firm as compared to the shareholders' equity percentage. Aliabadi et al. (2013) conducted a research on the most influential accounting performance measures and concluded that ROE is the 'numero uno' indicator used in most industries world-wide.

The above explains why this study uses the combination of ROA and ROE, ROA in one perspective helps investors measure how management utilise its assets or resources to generate more income. On the other perspective, ROE helps investors gauge how their investments are generating income. Moreover, firms with high performance using ROA as performance measurement concretes the effective and efficient management actions in dealing with the resources of the firms in a longer period of time, whereas ROE ultimately contribute to the country's economy (Aquizzi & Paynee, 2007).

2.3 Theoretical Studies

The discussion below discussed on the theoretical assumptions related to this research study such as agency theory, stewardship theory and stakeholder's theory. This theory asserts the split of authority from the stakeholders by the nominating qualified executives in executing business matters for the investors (Kiel & Nicholson, 2003). When executives are seen incapable to serve the interests of the investors, conflicts and arguments may arise (Fama & Jensen, 1983; Jensen & Meckling, 1976). Eisenhardt (1989) highlighted

that this theory is focused on evaluating and providing answers for challenges on the association between the executives and owners.

2.3.1 Agency Theory

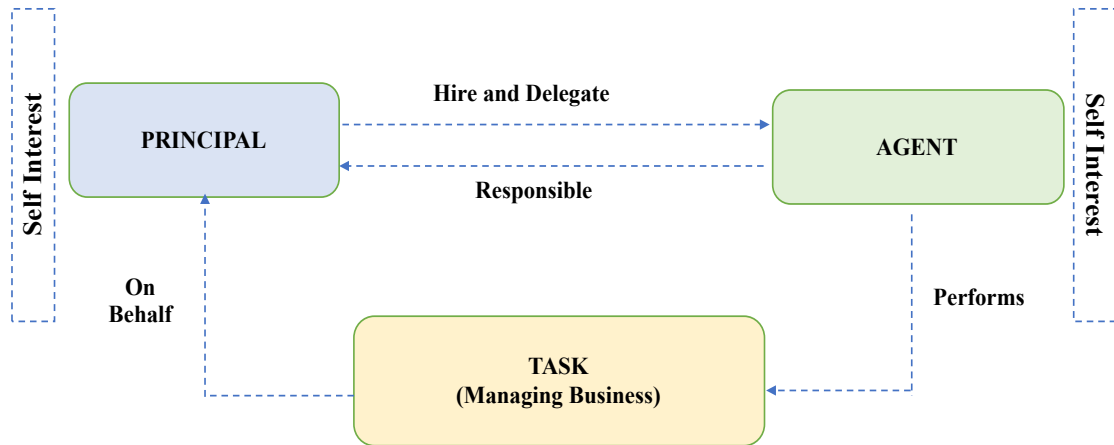


Figure 2.2: Agency Theory

Blair (1995) mentioned that this theory upholds the maximising of profits which leads to the increase of shareholders' wealth. Thus, Pavlik et al. (1993) advocates that the assessment and rewards must rely more than one performance measurement as well as taking into consideration other measures responsive to the results.

2.3.2 Stewardship Theory

Davis et al. (1997), Nguyen (2020) and Zahra et al. (2008) mentioned that this concept emphasises in the achieving goals and dominating the business activities, focusing on the owner and agent relationship, thus it differs them the agency theory. This theory presumes that agent (executive) fancies to serve the organisation goals rather than satisfying personal economic desires, and accomplishing the mission and vision the organisation. Davis et al. (1997) added that the stewardship actions are boosted by the presence of authoritarian

type of leaders, and performed better when compared to an agency-based leadership underlining the control over the financial matters. Organisations collaborating a mix of functional and culture are able to demonstrate strategic flexibility (Puig et al., 2005; Worren et al., 2002). Association with investors transpire only in situations with the existence of specific organisation structure, with the earlier act with proper psychosomatic profile and risk inclinations, thus this theory is the adversary of the agency theory that is dependent on the control and supervision elements (Davis et al., 1997). Figure 2.3 is the summarized diagram of the stewardship theory.

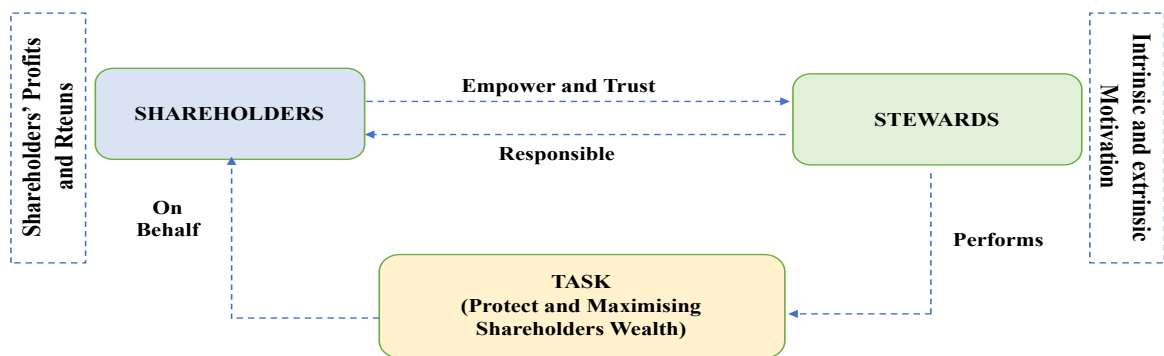


Figure 2.3: Stewardship Theory

2.3.3 Stakeholders Theory

In the earlier stages, this theory describes stakeholders as person / s may affect or be affected by the accomplishments of organisations' objectives (Freeman, 1984). However, in 2004, Freeman delineates stakeholders as group of individuals essential to the going concern of a corporation, i.e. they have the option of taking action against the directors for departing from performing the responsibilities with due care. Jamali (2008), added that greater performance would be achieved when the stakeholders are in the loop of networking and communication, when compared to the emphasis on the effort of maximising profits. Figure 2.4 indicates the relationship between internal stakeholders and stakeholders with the firms.

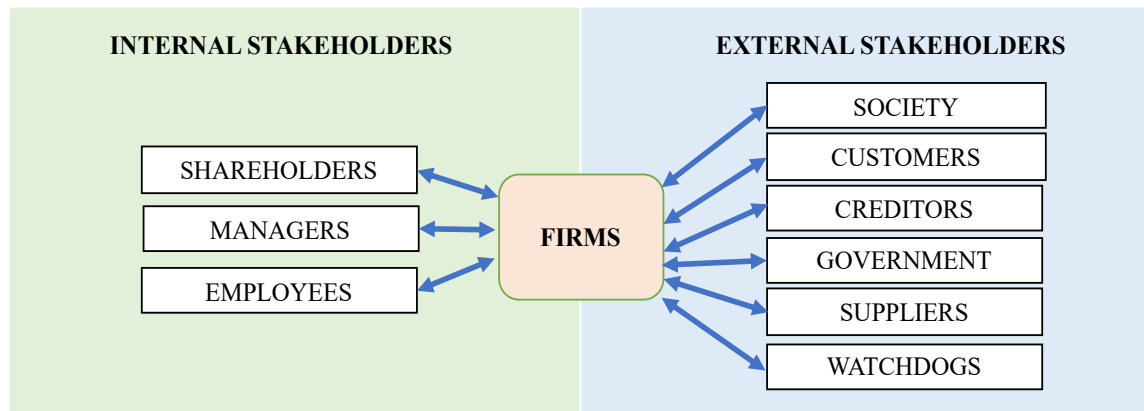


Figure 2.4: Stakeholders Theory

2.3.4 Pecking Order Theory

The principle of pecking order indicates firms have a specific order of choice for money used to fund their businesses (Myers & Majluf, 1984). The corporation would favour retained earnings over debt, short-term debt to long-term debt, and debt to equity, owing to the information asymmetries between the business and future investors. Chen et al. (2011) concluded that if firms only use its retained earnings instead of issuing new security to support the investment opportunities, the information asymmetric can be resolved. That means issuing equity becomes costlier as the insiders and outsiders of asymmetric information expand. Companies that have a significant asymmetry of information will issue debt to prevent the selling of under-priced securities. The rising capital structure of events such as new stock offering contributes to a fall in stock prices for a company. Insider investors prefer to restrict the use of equity to maintain ownership of the company (Hutchinson, 1995). Managers will choose internal finance such as retained earnings relative to external finance. In extreme situations, firms will select the external funds, but debt financing is the first choice before convertible securities the next and the equity issuance is the last option (Myers, 1984). Myers (2001), revealed that this theory clarifies why high-profit companies are less dependent on debt funding as these companies have more internal

financing available for capital investments rather than a low debt ratio target. The pecking order theory is applied by firms with low profitability by issuing more debt when the internal funds provided are insufficient. This proposed theory is supported with studies by Agyei and Owusu (2014), Chen et al. (2011), Fama and French (2002), and Nguyen (2019). They found a negative association between profitability and decision on financing that is consistent with such theory. Apparently, these results have obviously shown that the performance of the company has an impact on the leverage decision.

2.3.5 Trade-Off Theory

Trade-off is referred to as the earliest theory of capital structure originating from Kraus and Litzenberger's (1973) study and emphasizing that each company has its optimal capital structure. Myers (2001) stated the marginal level value of tax shields that can fully offset the cost of financing is a way to determine the level of debt a company is owing. Essentially, such theory is the trade-off between the benefits gained (interest tax shields) and the losses (cost of financial distress, agency costs, bankruptcy costs) occurred to reflect the best decision in capital structure. In an ideal capital structure, the tax advantages eliminate the costs of financial distress completely. Financial distress can be assigned, according to Farooq et al. (2012), to the bankruptcy costs and also to the agency costs that arise when a firm's creditworthiness is default. This financial distress is a costly process and will adversely affect funding decisions and firm performance. The bankruptcy costs can be either the direct costs (legal and administrative expenses) incurred by a company when the company is default, or the insolvency-related costs. Indirect costs include loss of sales and profit, lowering creditworthiness and reducing firms' market value because they are unable to pay off the debt when it comes to losses of opportunity, supplier costs, customer costs and

so on (Fama & French, 2002). Myers (2001) indicated that the trade-off theory justified optimal debt levels and found that the ideal debt ratios varied between companies.

Numerous results from previous research have been used as determinants for this effective capital structure. Darminto and Manurang (2008) reported that the collateral value of assets (CVAS) is derived by dividing the book value of fixed assets by the total assets' book value, non-debt tax shield is derived by dividing the depreciation of the book value with the total assets, profitability represented by earnings before depreciation and amortisation of interest taxes, and growth is the book value's depreciated divided by total assets. Firms with high tangibility and high profitability tend to borrow more because being perceived to enjoy a lower risk of default. Unprofitable firms with risky, intangible assets (sustainable damage if financial distress is encountered) prefer equity finance more. This theory is aligned with Ruan et al. (2011) where is managerial shareholding significantly affects the firm's leverage decision. They stated that managers could tempt the interest tax shields of debt financing and use the debt intensively at the expense of shareholders when the management shareholding is lower. Alternatively, managers use less debt as the risk of bankruptcy when managers' ownership is high and shareholders' interests align with that.

2.4 Hypothesis Development

The hypothesis developed for each of the variables are based on the review of past literature in different researches with either similar or different findings. These hypotheses are derived based on the research objectives to identify the effects of NCA on firms' performance using both ROA and ROE as proxies.

2.4.1 Fixed Assets Turnover Ratio (FATO) and Firms' Performance

FATO is an effective method used by financial statement users to gauge the firm's ability in utilising its NCA to generate revenue and is derived by dividing the revenue over

the average NCA. Basically, higher FATO indicates better utilisation of NCA that enables the firm to achieve its goals, i.e. high revenue and high profitability (Balatbat et al., 2010; Brigham, 1995; Chowdhury & Chowdhury, 2010; Fraser & Ormiston, 2004; Ramamonjiarivelo, 2016; Sunjoko & Arilyn, 2016). The effective use of NCA of firms are formed on the basis of the ratio of an integrated indicator of the efficiency of the use of the company's fixed production assets through the standardization of single efficiency indicator, i.e. FATO (Gajfullina et al., 2017). Al-Ani (2013) and Warrad and Rania (2015) studied on the impact of assets turnover and FATO against ROA for Jordanian and Sultanate of Oman firms and discovered that a significant relationship between assets turnover and FATO against ROA existed. They concluded that the assets activity ratios explain the changes in the ROA and the ratios have significant impact for the country's industrial sector's performance. Iqbal and Mati (2012) concluded that FATO has a positive relationship against ROA. Sunjoko and Arilyn (2016) added that the total assets turnover however does not affect firms' profitability.

Contrarily, Harianto (2017), discovered that FATO has a negative but insignificant influence over ROA for the information technology product companies in Indonesia. Iqbal and Mati (2012) established that FATO has a positive relationship against ROE. Al-Ani (2013) ascertained the existence of impact between assets turnover and FATO on ROE for the study conducted in the Sultanate of Oman manufacturing firms. Popa and Ciobanuwe (2014) verified the influence of FATO, turnover, price earnings ratio, duration of current assets by turnover and leverage over ROE for SME's in Romania. Harianto (2017), discovered that FATO has a positive and significant influence over ROE for the information technology product companies in Indonesia.

It has been concluded the coefficient of fixed asset turns tends positive towards gross profit margin in most of the non-financial companies as compared to other profitability ratios like ROA and ROE. Following the above discussion, the research hypothesis developed is:

H1: There is a positive significant relationship between FATO and firms' performance.

2.4.2 Assets Tangibility (ASTA) and Firms' Performance

Besides intangible assets, tangible assets are also under the category of NCA. These are the assets that can be physically seen and touch and be separated into current assets and NCA depending on the physical characteristics of the assets, for example, land, buildings, machinery and equipment or better known as property, plant and equipment (PPE) are categorized under NCA (Ashmarina & Zotova, 2015; Lerner, 2004). MFRS 116 also described that property, plant and equipment (PPE) is a long-lived tangible asset or non-current assets that is difficult to be converted into cash. Further, Figure 2.5 explains that tangible asset, in this case, property, plant and equipment (PPE) it is not held for sale or change frequently but is intended to actively used in the normal course of a business operation process to generate future sales/benefits. The tangibility of assets is derived by dividing the NCA over the total assets owned by firms.

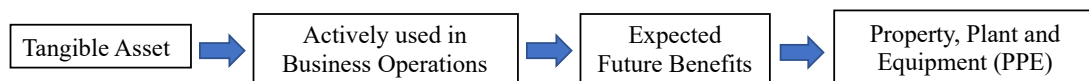


Figure 2.5: Tangible Assets

There are many reasons why the assets tangibility is considered important in this research study. First, excessive tangible assets were negatively related to profitability because of the expensive maintenance inherent with these assets. This assumption is based

on the prior research studies reported that investment in tangible assets may have an important effect on the firm's profitability and may have a negative correlation. This means that the high proportion of NCA lessen the financial performance (Onaolapo & Kajola, 2010; Zeitun & Tian, 2007). High levels of tangible assets reduced profitability due to less sales variation, low in research and development exercise and bring down the investment opportunities in the long run (Kebewar, 2013), thus concluding to a negative relationship between tangibility and firm's profitability.

Mehmet and Mehmet (2018) examined the influence of financial characteristics on the profitability of energy firms listed on Borsa Istanbul Stock Exchange. Quarterly (2008:Q1-2015:Q4) panel data of 10 quoted energy firms was employed for the study. The multiple regression analysis of the study showed that the tangibility of the ratio of tangible assets to total assets had a substantial negative impact on the profitability of the firms as calculated by ROA.

Unlike the above scholars, the coefficient of tangible asset tends to be positive in most of the non-financial companies when gross profit margin (GPM) is used as a proxy of performance instead of profitability ratios like ROE and ROA (Iqbal & Mati, 2012). This is unlike the findings by Pouraghajan and Malekian (2012) where asset turnover and tangible asset structure are statistically and positively correlated with ROE and ROA for the period 1998 to 2012. Odusanya et al. (2018) analysed the determinants of financial performance of 114 companies listed on the Nigerian Stock Exchange and found that assets tangibility had an insignificant impact on the profitability of the businesses through the Generalized Moment Method (GMM) methodology of data analysis.

Second, the importance of tangible assets helps to determine the overvalued or undervalued of market share price of a particular firm. In other words, a firm with high value

of net tangible assets per share has low risk in terms of liquidity. This means that high net tangible assets value serves as a safeguard against the market uncertainty and support the firm's stock price.

Third, tangible assets play a vital role in the capital structure of a company. Shah and Hijazi (2004), in their research discovered asset tangibility are positively correlated with leverage. Here, the company with more tangible assets generally utilize debt financing more heavily. The performance of Swedish real estate industry showed that the firm's performance could be explained by its assets tangibility and debt ratio (Hammes & Chen, 2004). For example, during financial distress, the assets are easier to be collateralized without losing a lot of value fall. Thus, the tangible contributes to the profitability of a firm serving as collateral for bank loans.

Adversely, some other researchers discovered that the investments in tangibles assets do not strongly and significantly impact on the level of reported profit (Okwo et al., 2012). On an extreme note, Masood, et al. (2017) opined that in the existing business landscape, tangible assets like land and labour are said to be no longer significant as a determinant for business performance. Instead, only organizational asset and reputational asset i.e. intangible assets are relevant and significant. Based on the above literature, this research study anticipate that assets tangibility would have an important effect and developed a hypothesis: H2: There is a significant negative relationship between ASTA and firms' performance.

2.4.3 Total Asset Turnover Ratio (TATO) and Firms' Performance

Total Asset Turnover Ratio (TATO) is a ratio often used in gauging the assets turnover of a firm, in terms of the return per ringgit invested in securing the assets (Irman et al., 2020; Padachi, 2006). In other words, TATO enables the user of financial statements to measure the assets ability in generating revenue (Babalat et al., 2010). Higher TATO is

desired by firm as it marks the proper asset management, optimisation on the asset potential benefits whilst scoring high TATO and ROA (Irman et al., 2020). Interestingly, Jumahana (2017) and Rahmah et al. (2016) stated that TATO has a significant negative effect on ROA.

However, this statement contradicts with the results obtained by Irman et al. (2020) and Putry and Erawati (2013) i.e. total assets turnover has a significant positive effect on ROA. Al-Ani (2013) reported that TATO and ROA have a significant and positive relationship for the research done in the Sultanate of Oman. TATO has a significant positive effect on ROA, which means that the higher the TATO, the higher return on assets and vice versa (Irman et al., 2020). Babalat et al. (2010), discovered that the Australian's construction firms have a below average TATO as compared to other international construction and engineering firms. The hypothesis developed from the above discussion is:

H3: There is a significant positive relationship between TATO and firms' performance.

2.5 A Remark

Generally, this study considers the earlier investigation result as a basis and guidance in determining the effects of NCA towards firms' performance for construction sector in Malaysia. This includes the literature review allied to the independent and dependent variables for this study such as NCA, FATO, ASTA, TATO, ROA, ROE etc., and brief discussion on the theoretical studies related to the study area which includes the Agency, Stewardship, Stakeholder, Pecking Order and Trade-Off theories are also included. Having said so, this chapter is intended to extend the understanding of the study topic from previous literature and act as a guide in setting the focus for this study.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This first section of this chapter discusses on the research design. This is followed with data collection and sampling design. The fourth section laid down the estimation model to describe on the model used in the research study. Next, the variables measurement section is an explanatory on the dependent variable, independent variables and control variable of the research study and the method to calculate them. Then, the next section describes the data analysis using several research methods including Descriptive Analysis, Correlation Analysis, Pooled Ordinary Least Square (OLS) Regression Model, Diagnostic Test, Breusch-Pagan (BP) Lagrange Multiplier test and Hausman test. In the final section of this chapter is the chapter summation.

3.2 Research Design

This research design serves as a guide for the research study to define the methods and procedures used in the research review information collection process (Zikmund et al., 2013). This research study is focused on positivism, which includes applying theory to establish hypotheses leading to statistical analysis. Therefore, this research analysis is a quantitative study because the main purpose is to test the hypotheses in numerical measurement by integrating reviews of the preceding literature to solve the research questions that have been created.

Various literature reviews have indicated the NCA has influence in determining the growth and expansions of construction firms, improving the firms' performance by creating higher revenue as well as being used as a collateral during crisis scenario (Kantudu, 2008; Nguyen, 2019).

The study examines whether non-current asset (NCA) influences firm's performance. The non-current asset theories are numerous that include the theory of agency, the theory of trade-offs and the theory of pecking order. These theories show that NCA factors have a positive or negative effect on firm's performance. In Chapter 2, the theoretical framework explains in detail on the relationship of all the selected variables. A further two research designs adopted in this analysis were built for descriptive and causal analysis. Descriptive research design was used to define the characteristics of non-current asset variables along with firm's performance indicators. Causal study design aims to investigate the effect on firm efficiency of fixed asset turnover (FATO), asset tangibility (ASTA), total asset turnover (TATO), firms size (SIZE) and financial leverage (FLEV) on firm's performance i.e. return on asset (ROA) and return on equity (ROE).

3.3 Data Description

In this analysis, the data collection approach applied was secondary data approach, where data was previously collected and documented to serve previous purposes. The sample data were obtained from DataStream, the website of Bursa Malaysia and the company's annual report. The period for the panel data regression is over seven years from 2011 to 2017. Additionally, some of the data needed were obtained from the database of UNIMAS DataStream, official website of the sampled firms, journals, and textbooks.

Investigating each member of the population is impractical, expensive and time-consuming, since populations may be too large. Hence, a method of choosing a sample from a given population called sampling were used to represent the entire population. The sample was selected using non-probability sampling technique, which was the (purposive) sampling technique for judgment. This technique involves a seasoned person selecting the sample based on personal judgment regarding some appropriate sample member characteristic

(Zikmund et al., 2013). This research is based on sample of 55 listed firms in the construction sector under Bursa Malaysia. However, there are only 38 firms (refer Appendix A) with complete data or published annual reports or audited financial statements over the 2011 to 2017 year range. Therefore, the other 17 firms were excluded from the sample.

3.4 Conceptual Framework

This study selected three independent variables, fixed asset turnover, asset tangibility and total asset turnover while firms' performance (dependent variable) were indicated by return on asset and return on equity. Another two controlled variables also been selected which are firms' size and financial leverage. The research framework in Figure 3.1 represents the relationship between the independent, dependent and control variables based on the research objectives and questions discussed in the earlier chapter. The NCA proxies are represented by FATO, ASTA and TATO, firms' performance are measured using ROA and ROE while the control variables are SIZE and FLEV and summarised in Figure 3.1.

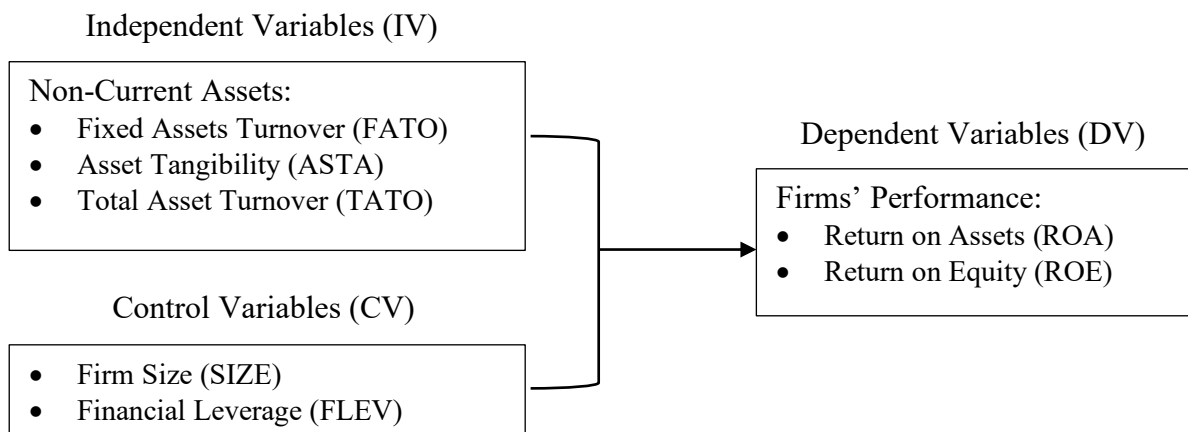


Figure 3.1: The relationship between Non-Current Assets and Firms' Performance

3.5 Model Estimation

The model diagram in the theoretical framework shows the independent variables (X) and dependent variables (Y), where the firms performance are represented by ROA and ROE while the NCA is proxied by the FATO, ASTA and TATO. The following regression models used to test the impact of non-current asset variables on firms' performance were based on Abdel Shahid (2003), Abor (2005), Ang et al. (2000), Ebaid (2009), Saedi and Mahmoodi (2009) and Tian and Zeitun (2007) expressed as follows:

$$ROA_{it} = \beta_{1i} + \beta_2 FATO_{it} + \beta_3 ASTA + \beta_4 TATO_{it} + \beta_5 SIZE_{it} + \beta_6 FLEV_{it} + \varepsilon_{it} \quad (3.1)$$

$$ROE_{it} = \beta_{1i} + \beta_2 FATO_{it} + \beta_3 ASTA + \beta_4 TATO_{it} + \beta_5 SIZE_{it} + \beta_6 FLEV_{it} + \varepsilon_{it} \quad (3.2)$$

where ROA represents return on assets and ROE is return on equity. i indicates the cross-sectional unit (firms) and t signifies the time period from 2011 to 2017. β_1 reflects intercept or constant term while $\beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ represents estimated coefficient of the independent variables and control variables. ε refers to the random error term. The independent and control variables are:

FATO = Fixed Asset Turnover

ASTA = Asset Tangibility

TATO = Total Asset Turnover

SIZE = Firms Size

FLEV = Financial Leverage

The relationship between firms' performance and the selected non-current asset variables was evaluated using the regression model for panel results. This study used two output metrics of the dependent variable as a measure of performance, which are ROA and ROE, the most widely and common proxies used as indicators relied on in most previous research.

3.6 Description of Variables

To remain consistent with previous studies, Figure 3.1 shows the measurements used in the research study to calculate the dependent, independent and control variables that influence firms' performance and being discussed in the following manner.

3.6.1 Dependent variable

Many earlier observational researches used ROA and ROE to assess efficiency of firms. In this analysis, ROA and ROE were used as the dependent variable because of their effectiveness as an indicator for financial efficiency. They both offer a different perspective on management's effectiveness. ROA indicates that the amount of income gained corresponds to the overall investment in assets (Fraser & Aileen, 2008). In other words, ROA explains managements' efficiency in gaining how much profit generated from each dollar of its assets.

ROE shows how efficiently the management of a company uses the shareholders' funds to produce income from every dollar the shareholders spend. This ratio is significant to all shareholders as it calculates the return received from their investment in the company by business owners and this study uses the measurement for ROA similar to Haniffa and Hudaib (2006), Ibrahim and Samad (2011) and Klapper and Love (2002) where net income is divided by total assets ($\text{Net Income} / \text{Total Assets}$). According to Bebeji et al. (2015), Belhaj and Mateus (2016), Boussaada and Karmani (2015), Dao and Hoang (2012), Fanta et al. (2013), Hagel et al. (2010), Jadah et al. (2016), Liang et al. (2013), Mauboussin (2012), Pathan et al. (2008), Sheikh and Karim (2015), Tomar and Bino (2012), ROE is calculated by dividing the net income over the shareholders' equity ($\text{Net Income} / \text{Shareholders' Equity}$).

3.6.2 Independent Variables

Fixed asset turnover (FATO), asset tangibility (ASTA) and total asset turnover (TATO) are the independent variables representing non-current asset. FATO tests the efficiency of long-term capital investment. The ratio reflects the amount of revenue generated by the investment in productive capability. This study uses the same measurement as used in the prior studies of According to Bebeji et al. (2015), Belhaj and Mateus (2016), Boussaada and Karmani (2015), Dao and Hoang (2012), Fanta et al. (2013), Hagel et al. (2010), Jadah et al. (2016), Liang et al. (2013), Mauboussin (2012), Pathan et al. (2008), Sheikh and Karim (2015), Tomar and Bino (2012) where sales is divided by the average NCA ($\text{Sales} / \text{Average NCA}$). The average NCA is derived by dividing the sales over the total of opening and closing balances of the NCA divided by 2.

As for ASTA, it raises the value that creditors can collect in case of bankruptcy (Almeida & Campello, 2007). A high ratio of fixed to total assets provides creditors with a high degree of protection since they would be able to liquidate more assets in case bankruptcy (Baker & Martin, 2011). The measurement for ASTA is following the measurement in Al-Najjar and Hussainey (2011) and Baker and Martin (2011) studies where it is calculated as the ratio of average NCA to average total assets ($\text{Average NCA} / \text{Average Total Assets}$). Average total assets is computed by dividing the average NCA over the total opening and closing balances of the total assets divided by 2.

Unlike FATO, TATO measures the overall investment efficiency by combining all assets instead of just property, plant and equipment as in FATO calculation. This ratio measures how much goods and services are sold for every ringgit of assets used during the analysed period. Tangible assets are physical assets that are used for a fairly long duration in the operation of the company, such as land, houses, machinery and ongoing construction.

They are more valuable from the creditors' point of view as they are readily liquidated in bankruptcy states known as court verifiable (Campello & Giambona, 2012). They can be given as collateral to creditors in case of default and insolvency. Following the measurement in Akintoye (2008), Muritala (2012), Pouraghajan and Malekian (2012), Putry and Erawati (2013) studies, TATO is calculated using the sales divided by average total Assets (Sales / Average Total Assets).

3.6.3 Control Variables

Two control variables were adopted in the regression model to control the firms-specific factors that may influence the performance (Kumar, 2016): firms' size (SIZE) and financial leverage (FLEV). One of the controlled variables, SIZE, calculated total assets as a logarithm to track the impact of the economies of scale (Abor, 2007; Al-Saidi & Al-Shammari, 2013; Fanta et al., 2013; Hafez, 2017; Pathan et al., 2008; Purag et al., 2016; Shafana, 2016; Siromi & Chandrapala, 2017; Tomar & Bino, 2012), in their studies uses logarithm of the total assets to measure firms' size. The importance and significance of the firm size towards the firms' performance have always been highlighted and supported by Alghusini (2015), Duchin et al. (2010) and Korajczyk and Levy (2003), Zeitun and Al Kuwari (2012). Vijayakumar and Tamizhselvan (2010) justified that SIZE and firms' performance are significant and critical on the success of firms.

FLEV and profitability are two foundations that businesses should pay more attention as effective financial leverage is very critical because of its direct effect on the company's productivity and hence the survival of the company on the market. Leverage is characterised as the debt-to - asset ratio resulting from a total t-year division of total t-year equity (Dreatchlin et al., 2017; Rusdiyanto et al., 2020). This means that financial leverage wields significant impact toward firms' performance and consistent with the observations reported

by Akinlo and Asaolu (2012) and Daud et al. (2016). Onaolapo and Kajola (2010) underlined that the financial leverage has a significant and adverse impact on the performance of firms.

Table 3.1 is the summary of the proxy variables and their measurements that have been discussed.

Table 3.1: Proxy Variables and their Measurements

Variables	Measurement	Formula	Prior research
Return on Assets (ROA)	Net income divide by Total Assets	$\frac{\text{Net income}}{\text{Avg. Total Assets}}$	Klapper & Love (2002), Haniffa & Hudaib (2006), Ibrahim & Abdul Samad (2011)
Return on equity (ROE)	Net income divide by the shareholders' equity	$\frac{\text{Net income}}{\text{Shareholders' equity}}$	Mauboussin, M. J. (2012), Tomar & Bino (2012), Hagel III, J. et al. (2010), Fanta et al. (2013), Dao & Hoang (2012), Bebeji et al. (2015), Boussaada & Karmani (2015), Jadah et al. (2016), Liang et al. (2013), Pathan et al. (2007), Belhaj & Mateus (2016), Sheikh & Karim (2015)

Table 3.1 continued

Variables	Measurement	Formula	Prior research
Fixed Assets Turnover (FATO)	Sales divide by the Average Fixed Assets	$\frac{\text{Sales}}{\text{Avg. Fixed Assets}}$	Tomar & Bino (2012), Fanta et al. (2013), Dao & Hoang (2012), Bebeji et al. (2015), Boussaada & Karmani (2015), Jadah et al. (2016), Liang et al. (2013), Pathan et al. (2007), Belhaj & Mateus (2016), Sheikh & Karim (2015)
Asset Tangibility (ASTA)	Average Fixed Assets divide by Average Assets	$\frac{\text{Avg. Fixed Assets}}{\text{Avg. Total Assets}}$	Al-Najjar, B., & Hussainey, K. (2011); Baker & Martin (2011)
Total Asset Turnover (TATO)	Sales divide by Average Total Assets	$\frac{\text{Sales}}{\text{Avg. Total Assets}}$	Akintoye (2008), Muritala (2012), Pouraghajan & Malekian (2012), Erawati (2013)
Firm Size (SIZE)	Logarithm of the total assets	Logarithm of the total assets	Al-Saidi & Al-Shammari (2013), Tomar & Bino (2012), Fanta et al. (2013), Pathan et al. (2007)

Table 3.1 continued

Variables	Measurement	Formula	Prior research
Firm Leverage (FLEV)	Average Total Liabilities divide by Average Total Assets	$\frac{\text{Avg. Total liabilities}}{\text{Avg. Total assets}}$	Al-Saidi & Al-Shammari (2013), Kyereboah- Coleman & Biekpe (2006), Pathan et al. (2007), Sheikh & Karim (2015), Patrick Ogebe (2013)

3.7 Statistical Analysis

Several appropriate analytical techniques have been used to test the relationship between the variables. First, the data was collected and analysed by means of descriptive analysis (mean, mode, median, standard deviation, variance, skewedness, and kurtosis) in order to quantify for central tendency, dispersion and data distribution. Next, the correlation matrix was also intended to measure the intensity and direction of the linear relationship between independent variables and dependent variables. Then, run the diagnostic test to make sure the predicted model is stable before running the program. Consequently, few Classical Linear Regression Model (CLRM) assumptions need to be fulfilled. The Durbin Watson (DW) and Variance Inflation Factor (VIF) tests were used to test both autocorrelation and multicollinearity.

In addition, two tests were carried out to select the appropriate model from the Pooled OLS model, the random effects model (REM) and also the fixed effects model (FEM). First, the BP Lagrange Multiplier (BP) test was performed to determine whether the appropriate model was a Pooled OLS regression model or a random effect regression model. If the

random-effect model is chosen, then the Hausman test will continue. The test was performed to choose either REM or FEM. And if the null hypothesis is dismissed, and p-value less than 0.05, FEM will be chosen. All of the methodologies and tests mentioned above will be further discussed as follows in the next section.

3.7.1 Descriptive Analysis

Descriptive analysis helps to simplify the broad data collection in an ideal way to explain the basic characteristics of the data in the sample. The analysis includes central tendency, dispersion and distribution shape measurement (Zabri et al., 2016). Central tendency measurements represent the distribution centre for a data set, including mean, mode and median. Dispersion is to calculate the data sets variability i.e. how the data points differ from the mean value. These measurements include standard deviation values, minimum values and maximums. The distribution shape can help to determine other descriptive statistics, including which central tendency measure to use is suitable. When the data is normally distributed, the mean, mean and mode are all identical and are thus all acceptable central tendency measurements. Once a sample is collected in the analysis, the descriptive statistics are used to make inferences about the characteristics of the performance of the firms, the non-current variables of assets and the research control variables.

3.7.2 Correlation Analysis

This test is carried out to examine the relationship between all of the study variables. Correlation analysis is a statistical calculation of the intensity and direction of a linear association between two variables. The coefficient of correlation, r , can range from +1.0 to -1.0. The value of +1.0 signifies the presence of a perfect positive relation, while the value of -1.0 depicts the departure of a perfect negative relation. If the value of r is zero, no relation is indicated between the variables. The closer the value is to either +1.0 or -1.0, the solid

linear relation between variables. In addition, a correlation analysis could also be used to imply whether or not there is a concern of multicollinearity among independent variables. The issue of multicollinearity arises because of the high coefficient of correlation (Isik & Ince, 2016). In general, Jadah et al. (2016) stated that no problem of multicollinearity occurs if the association between independent variables is not higher than 0.8.

3.7.3 Pooled Ordinary Least Square (OLS) Regression

One of the panel data prediction strategies for achieving more precise estimates of the parameters in the model was the Pooled OLS regression (Gujarati & Porter, 2009). Panel data includes a combination of time series and cross-sectional data that requires combining analyses on a cross-sectional unit over several time periods, and producing result that unable to be based purely on time series and cross-sectional analysis (Abor, 2007). The distinction between the equation of panel regression and regular time-series or cross-section regression is the dual subscription appended to every variable. The pooled OLS regression model has been used in this study to identify the effects of non-current asset variables on construction firms in Malaysia. The regression model is formulated as below:

$$Y_{it} = \beta_{1i} + \sum \beta_k X_{it} + \varepsilon_{it} \quad (3.3)$$

where Y is dependent variable, in this study is ROA and ROE of firms i for time period t , β_1 is the intercept, β_k is the regression coefficients for X_{it} variables. X_{it} indicates the independent variables (FATO, ASTA, TATO, SIZE, and FLEV) of firms i for time period t .

The following is the hypothesis for Pooled OLS regression:

H_0 : *There is no relationship between the variables.*

H_1 : *There is a relationship between variables.*

The rejection rule for Pooled OLS regression is depending on the p-value and t-statistic value. Reject H_0 when the p-value is less than α significance level and t-statistics is more than the critical value. This means p-value is statistically significant at significance level of 1 percent, 5 percent or 10 percent and there is relationship between the independent and dependent variables. Nevertheless, accept H_0 if p-value is more than α significance level and t-statistics is less than the critical value. This means p-value is statistically insignificant at significance level of 1 percent, 5 percent or 10 percent and there is no relationship between the variables.

3.7.4 Diagnostic Tests

There are three econometric assumptions being tested for normality, autocorrelation and multicollinearity before the panel data was used to test on the hypothesis (Achchuthan et al., 2013; Chitiavi et al., 2013; Hafez, 2017; Jaradat, 2015; Kajanathan, 2012; Shafana, 2016; Uwuigbe, 2014; Vaklifard et al., 2011; Wellalage & Locke, 2012). The Jarque-Bera (JB) normality test, Durbin Watson (DW) test, Variance Inflation Factor (VIF) and White test were run by using Eviews 11.

3.7.4.1 Normality Test (Jarque-Bera)

Normality test used in this research is to identify whether any sample or group of data suitable with standard normal distribution. Jarque-Bera (JB) test is a type of goodness of fit and proposed to use for testing the normality. JB test is the most commonly used normality test to determine the skewness and kurtosis of sample data which matched with normal distribution. A perfect normal distribution of the diagram has skewness equal to zero and kurtosis equal to three (Gujarati & Porter, 2009). The peak of the distribution and the amount of data in the tails can be identified by testing the kurtosis with normality test. The following is the hypothesis for the normality test:

H_0 : The variables are normally distributed.

H_1 : The variable is not normally distributed.

When data originates from a normal distribution, the test statistics can be contrasted with two degrees of freedom for the chi-squared distribution. The rejection rule for normality test states reject the null hypothesis (H_0) if the p-value is less than α significance level. This means the p-value is statistically significant at significance level of 1 percent, 5 percent or 10 percent and the variables are not normally distributed. In contrast, accept the null hypothesis (H_0) when the p-value is greater than α significance level. This means the p-value is statistically insignificant at significance level of 1 percent, 5 percent or 10 percent and the variables are normally distributed in the model.

3.7.4.2 Autocorrelation Test (Durbin Watson)

Autocorrelation can be described as serial correlation in residuals in either time - series data or cross-section data. This method is used to underestimate the standard error and measure the importance and significance of the predictors when no standard error exists. Durbin Watson test is often used to assess the serial correlation of a particular form. Durbin Watson test capable of detecting strong autocorrelation order and the lagging dependent variables (Gujarati & Porter, 2009). The following is the hypothesis for autocorrelation test:

H_0 : There is no autocorrelation problem.

H_1 : There is an autocorrelation problem.

The rule of rejection for the Durbin Watson test involves H_1 is rejected when the figure is equal to 2 because it means no autocorrelation exists. Conversely, the association of the first order occurs when the range is from 0 and less than 2 and in the results is greater than 2 to 4. So, there is no rejection of H_1 .

3.7.4.3 Multicollinearity (Variance Inflation Factor)

The Variance Inflation Factor (VIF) is a diagnostic measure often used in regression analysis as a predictor of multicollinearity. Multicollinearity occurs when a regression model involves an exact or nearly exact linear relationship between some or all of the independent variables (Gujarati & Porter, 2009). Variance Inflation Factor (VIF) anticipates the degree to which the variance of the evaluator or coefficient of regression due to the presence of multicollinearity.

Following is the VIF for the predictor defined by Gujarati and Porter, (2009):

$$VIF = \frac{1}{1-R_i^2} \quad (3.4)$$

where R_i^2 refers to R-squared value derived from the experiment by regressing the its predictor against other predictors. When R^2 reaches 1, the degree of collinearity between one explanatory variable with another increases. Hence, VIF also tends to increase and may be infinite within the limits (Gujarati & Porter, 2009). Further, no correlation exists between the explanatory variables when VIF is 1. When a variable's VIF reaches 10, it suggests that the explanatory variables are strongly correlated, a multicollinearity problem exists.

3.7.4.4 Heteroscedasticity

Heteroscedasticity can be viewed as if the regression model is inconsistent with the variance of errors. It arises when the classical linear regression model (CLRM) assumptions that there is a constant variance with zero mean of the error terms are not fulfilled. A common heteroscedasticity test is the White test, which enables the independent variables to have a non-linear and interactive effect on the variance of errors. The following is the hypothesis using chi-squared formula:

H₀: The error variance is homoscedastic

H₁: The error variance is not homoscedastic

In accordance to the rejection rule, when the number is more than 2, the null hypothesis is rejected. This means the error variance is heteroscedastic.

3.7.5 Breusch-Pagan (BP) Lagrange Multiplier test

In statistics, a linear regression model uses the Breusch - Pagan test, introduced by Trevor Breusch and Adrian Pagan in 1979, to determine the presence of heteroscedasticity. The BP test was conducted in order to select either Pooled OLS or Random Effects Model (REM) in the research study. The null hypothesis in the BP test is the variance of random effects is equivalent to 0, whereas the alternative hypothesis is that the variance of random effects is not equivalent to 0.

The following is the hypothesis for BP test:

H_0 : *Pooled OLS Model*

H_1 : *Random Effects Model*

When p-value is less than α level of significance, H_0 is rejected and H_1 that is random effects model (REM) is more suitable model to use in the analysis. Unless p-value is greater than the meaning point of α , the null hypothesis is not dismissed, suggesting that the pooled OLS is the preferred model relative to the model of random effects.

3.7.6 Hausman Test

The Hausman test was conducted to identify whether the fixed effects model (FEM) or random effects model (REM) is suitable for this research. The FEM presumes that the coefficient estimates of the independent variables do not vary across individuals or even over time (Gujarati & Porter, 2009). The interception in the regression model is different because each individual or cross-section unit have its own unique features. If the independent variable is correlated with the individual-specific intercept, then FEM is appropriate.

However, if the intercept (random) is not associated with independent variables, REM is appropriate. The following is the hypothesis for Hausman test (Isik & Ince, 2016):

H_0 : *There is no association between individual intercept and independent variables.*

H_1 : *There is association between individual intercept and independent variables.*

Based on the above hypothesis, the preferred model under H_0 is REM and the preferred model under H_1 is FEM. Reject null hypothesis when the p-value is less than 1 percent, 5 percent or 10 percent level of significance. Accept null hypothesis when the p-value is more than α level of significance. If the null hypothesis is dismissed, it means REM is not suitable because there is a connection between individual intercepts and independent variables. Consequently, FEM is preferable to REM.

3.8 A Remark

This chapter focused on the approach to data collection and sampling design which helps to collect data for this research. Several suitable research methods that were adopted to analyse the data collected. The next chapter discussed the findings and results, the conclusions and recommendations.

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presented and discussed the results of the study as set out in methodology as per the earlier chapter. The findings of the descriptive analysis, correlation analysis, Pooled Ordinary Least Square (OLS), Random Effect and Fixed Effect regressions, the diagnostics tests inclusive of normality test, autocorrelation test, multi-collinearity test, heteroscedasticity test, BP Lagrange Multiplier test and Hausman test were analysed in this chapter as well. The summary of the hypotheses is presented in last section.

4.2 Descriptive Analysis

This section summarizes the statistics of the variables used in this research. This research uses ROA and ROE as proxies for the performance measures. The selected independent variables in this research are FATO, ASTA and ASTO, while Further, this research uses SIZE and FLEV as control variables.

Table 4.1: Descriptive Analysis

	ROA	ROE	FATO	ASTA	TATO	SIZE	FLEV
Mean	0.034147	0.058283	0.529673	0.325513	0.411801	8.745720	0.520714
Median	0.027700	0.050600	0.473100	0.311550	0.397100	8.716300	0.507850
Max.	0.237300	0.367000	2.779000	0.657200	1.042000	10.22430	1.265000
Min.	-0.083300	-0.106200	0.003700	0.083600	0.125700	7.420100	0.138600
Std. Dev.	0.042147	0.072492	0.339172	0.103615	0.147921	0.484349	0.194477
Skewness	1.342221	0.750084	3.478983	0.415234	1.110473	0.569588	0.492726
Kurtosis	7.284298	4.866142	20.28115	3.527843	5.030654	4.343716	3.438650
Jarque-Bera	283.3060	63.54064	3846.488	10.73194	100.3724	34.39484	12.89577
Probability	0.000000	0.000000	0.000000	0.004673	0.000000	0.000000	0.001584
Sum	9.083000	15.50340	140.8929	86.58650	109.5390	2326.361	138.5098
Sum Sq. Dev.	0.470734	1.392596	30.48498	2.845048	5.798337	62.16740	10.02266
Observations	266	266	266	266	266	266	266

Table 4.1 emphasis on the mean and standard deviation of the variables in acquiring the central propensity used measure the central tendency and spread. Mean is used to measure the central tendency of the arithmetic average scores. In computing the mean, all the respective values are added up and divided by the number of the respective values. Originally, 55 firms from the construction sector was being shortlisted, however, due to the insufficient data in meeting the set criteria, only 38 firms were selected as the sample. The table of descriptive statistics above demonstrates sample consisting of 266 observations from the period of 2011 to 2017 for 38 firms and characteristics of variables being elucidated as follows:

ROA as a proxy of profitability has an average value of 3.42 percent, with a maximum of 23.73 percent to the lowest of -8.33 percent. This value describes that on average, firms yield 3.4 sen for every Ringgit spent on assets; the highest return on assets recorded at 23.7 sen from every Ringgit disbursed and the lowest value means that firm has to absorb up to 8.3 sen for every Ringgit spent on assets. The median value of ROA is at 2.7 sen and is lower when compared to the mean at 3.5 sen, describes the data is positively skewed and show that the construction sector is recording a positive overall performance despite of low in value.

Another performance proxy, ROE has a mean of 5.83 percent, with the maximum value recorded at 36.70 percent and the lowest value at -10.62 percent. Commonly, on average firms would be able to make a return of 6 sen for every Ringgit spent equity, with the highest return was recorded at an attractive 37 sen per Ringgit while the most unfavorable return was a loss of 11 sen on every Ringgit used in equity. The median of this variable is at 5.1 percent, lower than the mean value at 5.8 percent, denotes that generally the firms in this sector are able to generate returns on the investments by the shareholders.

FATO has a mean value of 53 percent, and the turnover ratio has a wide-spread value from the highest of 278 percent to the lowest value of 0.3 percent for the selected period. This transpires that for every RM 1 spent on non-current assets, on average firms would be able to generate 53 sen worth of revenue with the highest income generated recorded at RM 2.78 and the lowest at 3 sen income from every single Ringgit spent on non-current assets. The median of FATO is at the value of RM 0.473 and is lower than the mean recorded during the period. The differences between the highest and lowest ratio could cause potential problem in the under-utilisation of non-current assets and in the end affect the firms bottom-line. Thus, it is critical for firms with big capital assets to generate considerable revenue defined by management in achieving the desired profits by making full use of the capital assets.

Meanwhile, the average value for ASTA stands at 32.5 percent, the extreme value recorded at 66 percent and the lowermost value at 8.4 percent. This means that on average, the proportion of non-current assets towards the total assets of firms is at 32.5 percent, the lowest with an 8.4 percent ratio between fixed and total assets and the uppermost proportion of fixed to total assets is at 66 percent. With the standard deviation lies at 10.4 percent, we could predict that most firms are having a high fraction of non-current assets over total assets in the Malaysian construction sector.

TATO has a mean of 41 percent which demonstrates that with every Ringgit spent in total assets, on average firms would be able to yield 41 sen in terms of revenue. The maximum value exposed the ability of firm in yielding revenue valued at RM 1.04 for every single Ringgit spent on assets and for the firm with the lowest value only managed to produce a revenue of 13 sen with RM 1 spent on assets.

SIZE computed by using the logarithm of total assets has a mean value of 8.745720, the highest value of 10.2243 and a minimum value of 7.4201 and the standard deviation for SIZE stands at 0.484. On the other hand, FLEV for the selected samples have an average value of 52 percent, i.e. the total assets acquired are financed by leverage or liabilities at 52 percent and another 48 percent completes the financing part. Maximum FLEV value from the data is at 126 percent and the minimum value at 14 percent. From the figures, it is obvious that the Malaysian construction firms favour external financing, but the higher leverage would result in shrinking the equity portion of firms as manifested in the results.

4.3 Correlation Analysis

Correlation analysis was being performed in analysing and investigating the existence of possible association among the selected variables. Table 4.2 reports the correlation coefficient between the variables in the research. For any correlation analysis, the correlation coefficient value should lie between ± 1 , but the coefficients must not exceed ± 0.8 , as any higher value would be deemed as multi collinearity set of data. Thus, the glimpse of the results supports the argument of non-existence multi collinearity issues in the regression model as none of coefficients exceeded ± 0.8 .

From the results, ROA is positively correlated with FATO, TATO and SIZE, while having an inverse association with ASTA and FLEV. The strongest correlation coefficient was between ROA and FLEV at -41 percent. Meanwhile, ROE is negatively correlated to ASTA and FLEV and the other three variables, i.e. FATO, TATO and SIZE are positively correlated with ROE. The strongest link between variables are between ROE and FLEV at -31 percent. In short, both ROA and ROE have a positive correlation with FATO, TATO and SIZE which means that any favourable changes in the variables would have an advantageous

impact towards the proxy variables. Any increase in value of ASTA and FLEV would shrink the values of the performance indicators.

Table 4.2 also depicts the correlation coefficients of the variables deliberated in this research. ROA and ROE are positively correlated with all the independent variables, i.e. FATO, ASTO and SIZE. This means that any changes in the stated proxy variables would give rise to a favourable impact towards ROA and ROE. On the other hand, both ASTA and FLEV has a negative correlation with the profitability proxies, thus giving an adverse impact towards both proxies for any change of value in those variables. Hence, from the results, the correlation matrix proposes the presence of sensible association between all variables as no variables in the research are highly associated.

Table 4.2: Pearson Correlation Coefficients

Correlation t-Statistic Probability	ROA	ROE	FATO	ASTA	ASTO	SIZE	FLEV
ROA	1.000000 ----- -----						
ROE	0.879765 30.06782 0.0000	1.000000 ----- -----					
FATO	0.070671 1.151147 0.2507	0.105358 1.721447 0.0863	1.000000 ----- -----				
ASTA	-0.021889 -0.355737 0.7223	-0.091696 -1.496195 0.1358	-0.029905 -0.486115 0.6273	1.000000 ----- -----			
TATO	0.129763 2.126375 0.0344	0.173290 2.858882 0.0046	0.243652 4.081901 0.0001	-0.164942 -2.717200 0.0070	1.000000 ----- -----		
SIZE	0.191908 3.177192 0.0017	0.229486 3.830941 0.0002	0.232008 3.875430 0.0001	0.241269 4.039483 0.0001	0.124717 2.042354 0.0421	1.000000 ----- -----	
FLEV	-0.413124 -7.370885 0.0000	-0.311294 -5.322387 0.0000	0.152737 2.511142 0.0126	0.195281 3.235226 0.0014	0.011431 0.185736 0.8528	0.168557 2.778487 0.0059	1.000000 ----- -----

4.4 Panel Regression Analysis

For this research study, the panel model of regression analysis was used in an attempt to further evaluate the links between the management of NCA and the firms' performance as indicated by Abdel Shahid (2003) and Ebaid (2009). In achieving the need, E-Views 11 Software was used to analyse panel results for a total of 38 firms from the construction sector in the Bursa Malaysia over a span of seven years from 2011 to 2017. The following is the regression estimation result where the profitability of firms is determined by the return on assets (ROA) and return on equity (ROE) are deliberated by fixed asset turnover (FATO), assets tangibility (ASTA), total asset turnover (TATO), the firm's size (SIZE) and the firm's leverage (FLEV).

4.4.1 Pooled Ordinary Least Square (OLS)

One of the methods used in prediction and estimation of data samples is pooled Ordinary Least Square (OLS) in order to analyse the effects of the non-current assets variables towards profitability, and the results are as per Table 4.3 illustrated the result on the regressed independent variables with ROA using the pooled ordinary least square method.

Based on the results from Table 4.3, it indicates that the determination of the vector, R-square is approximately 0.2559, and shows that the independent variables presented about 25.6 percent of the change in return on the assets that represent the profitability of the firms. This model also points out that the equation intercept is -0.112486 which indicates that the ROA is supposed to drop by 0.112486 percent should all variables remain stable and unchanged.

The finding indicates that a positive association exists between FATO and ROA but

suggesting that there is no association between the FATO and ROA and referring to the data gathered, the hypothesis is unable to be rejected even at a significant level of 10 percent, thus implying in accepting the null hypothesis where no association existed between the variables due to weak probability and weaken the possibility of increasing the profitable proxy when there is a change of value on FATO.

Table 4.3: Pooled Ordinary Least Square (OLS) of ROA

Dependent Variable: ROA

Method: Pooled Ordinary Least Square (OLS)

Total panel (balanced) observations: 266

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.112486***	0.041420	-2.715745	0.0071
FATO	0.008121	0.007082	1.146729	0.2525
ASTA	0.012335	0.023265	0.530204	0.5964
TATO	0.026976*	0.016043	1.681416	0.0939
SIZE	0.020610***	0.005006	4.116665	0.0001
FLEV	-0.101865***	0.012030	-8.467446	0.0000
R-squared	0.255875	Adjusted R-squared		0.241565
S.E. of regression	0.036705	F-statistic		17.88076
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

Besides FATO, the result of ASTA also showed the existence of a positive connection with ROA for the firm. The result also conveyed that ASTA has a statistically insignificant effect on ROA for the firm, hence denoting in accepting the null hypothesis where no significant correlation existed between both variables and giving rise to a low or nil likelihood of an increment in ROA with a change of value in ASTA.

In contrast, TATO is statistically significant at 10 percent towards ROA with a positive relationship at 0.027 percent, whereby an increase of 10 percent in TATO would hike up ROA by approximately 0.027 percent. In this case, the finding stated that TATO has

statistically substantial impact on the ROA, thus signifying that the null hypothesis should be rejected at a significant level of 10 percent and highlighting there is a relationship between TATO and ROA.

In addition, the finding also shows that there is a positive relationship between ROA and the SIZE of firms calculated by the asset log. The null hypothesis is dismissed at a 1 percent significant level since SIZE is highly significant and influences the ROA of the firm, indicating that a one percent rise in SIZE would improve returns by 0.0236 percent.

The result also demonstrates that the FLEV affects the ROA of the firm considerably and indicates that there is an opposing relationship between the two variables, suggesting that a one percent decrease in the debt ratio will result in a 0.102 percent rise in profitability. This means that the null hypothesis should be rejected as FLEV possess a significant influence over ROA.

Table 4.4 presents the result of the pooled ordinary least square regressed between FATO, ASTA, TATO, SIZE and FLEV with ROE. The result suggests that the estimation of the matrix, R-square is estimated at 0.207358 and illustrates that the predictor variables represented approximately 20.7 percent of the improvement in ROE, the proxy of profitability for firms. The model also points out that the intercept of the equation is - 0.249528, which means that ROE would decrease by 0.249528 percent when all variables remain stable and unchangeable.

The result suggests that there is a positive association between FATO and ROE but without any substantial effect on the firm's profitability substitute, since the probability value exceeded 0.10. This recommends that the alternative hypothesis is being rejected and accepting no association existed between ROE and FATO.

ASTA is seen to be having an inverse relationship with ROE, with the probability shown is 0.2672 which falls under the insignificant region. This denotes that ASTA statistically has no influence over the ROE, thus accepting the null hypothesis where ROE has no significant correlation with ASTA

Table 4.4: Pooled Ordinary Least Square (OLS) of ROE

Dependent Variable: ROE

Method: Pooled Ordinary Least Square (OLS)

Total panel (balanced) observations: 266

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.249528***	0.073527	-3.393672	0.0008
FATO	0.013977	0.012571	1.111851	0.2672
ASTA	-0.047419	0.041300	-1.148176	0.2520
TATO	0.056749**	0.028480	1.992578	0.0474
SIZE	0.041341***	0.008887	4.651690	0.0000
FLEV	-0.132674***	0.021356	-6.212589	0.0000
R-squared	0.207358	Adjusted R-squared		0.192115
S.E. of regression	0.065157	F-statistic		13.60342
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level..

Results revealed the significance of TATO at 5 percent towards the profitability proxy, ROE. This means that TATO has statistically substantial impact on the ROE, where a 5 percent increase in TATO would possibly give rise to ROE approximately 0.057 percent, thus connoting to reject the null hypothesis and to emphasis on the presence of a relationship between TATO and ROE.

The findings demonstrated the importance of SIZE at 1 percent against the productivity measure, ROE, thus suggesting to reject the null hypothesis. Since the favourable relationship between both variables is evident, a rise of 1 per cent in TATO value would lead to additional ROE of 0.0431 percent.

On top of that, the result also explains on the significance of relationship among FLEV and ROE at 1 percent level, with a negative value of 0.132764 percent. Again, the null hypothesis is discarded due to the existence of significant influence of FLEV over ROE, proposing that a 1 percent decrease in FLEV would hike up the ROE by 0.133 percent.

4.4.2 Random Effect Model

In searching for the best model to be selected and suitable with the data set, the random effect and fixed effect models are also regressed and shown as per Table 4.5 and Table 4.6 for the random effect model.

Referring to the results in Table 4.5, it could be ascertained that the coefficient of determination, R-square is 0.091105, which means that the independent variables explains 9.1 percent of the variance in ROA. Moreover, the model also reveals that the intercept for the equation is -0.043816, which reveals that the ROA is 0.044 percent lesser if the entire variables remain stable and unchanged.

Table 4.5: Random Effect Model of ROA

Dependent Variable: ROA

Method: Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.043816	0.058185	-0.753056	0.4521
FATO	0.035548***	0.011603	3.063745	0.0024
ASTA	-0.007458	0.027741	-0.268834	0.7883
TATO	0.011996	0.022113	0.542494	0.5879
SIZE	0.010057	0.006718	1.497186	0.1356
FLEV	-0.060182***	0.015386	-3.911405	0.0001
R-squared	0.091105	Adjusted R-squared		0.073627
S.E. of regression	0.024300	F-statistic		5.212351
Prob(F-statistic)	0.000141			

***Significant at 1% level

Results from Table 4.5 shows that any changes of value in ASTA, TATO and SIZE have no significant impact towards ROA as the probability values exceeded the 10 percent

benchmark. Thus, in this instance, the rejection of the alternate hypothesis could not be avoided and to conclude that ASTA, TATO and SIZE is statistically insignificant toward the profitability proxy, i.e. ROA. This results show an optimistic and important effect of FATO towards ROA of the firm, and therefore, we do not support the null hypothesis at 1 percent. This means we reject null hypothesis as the coefficient suggests that any increment in FATO by 1 percent, the firm's profitability measured by ROA would be improved by 0.0298 percent.

This model also clarifies the relation between FLEV and ROA existence which is statistically significantly and in a negative manner. Hence, the result contradicts with the null hypothesis as an increase of FLEV by one percent, the profitability variable, i.e. ROA would rise of 0.060182 percent.

Based on the results using the random effect model for ROE as per Table 4.6, it could be determined that the coefficient of determination, R-square, is 0.08462, which means that the independent variables contribute for 8.4 percent of the variance in ROE. In addition, the model outcome also indicates that the equation intercept is -0.13251, implying that ROE would be 13.25 percent lesser if the entire variables are static and constant.

The results above revealed that FATO has a significant and positive influence towards ROE, whereby an increase by 1 percent in FATO would result in the betterment of ROE by 0.0533 percent. In this instance, the null hypothesis is rejected due to the statistically significant results obtained for both relevant variables at 1 percent level of significance.

In addition to the above, SIZE has demonstrated a positive and significant influence over the ROE at the 10 percent level of significance by proposing for any 10 percent increase in SIZE, there would be an additional 0.024 percent ROE. Hence the rejection of null hypothesis between SIZE and ROE is recommended.

ROE and FLEV are seen to be having an inverse association that is influential, where a hike in FLEV by 1 percent would result in the dwindling of ROE value by 0.095 percent and suggests the rejection of null hypothesis. For the remaining variables, i.e. ASTA and TATO, both have shown insignificant results with the earlier is negatively related and the latter positively related. This presumes that the acceptance of the null hypothesis that signifies on the no relationship between the variables.

Table 4.6: Random Effect Model of ROE

Dependent Variable: ROE

Method: Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.132510	0.105545	-1.255476	0.2104
FATO	0.053290***	0.019934	2.673277	0.0080
ASTA	-0.048055	0.052469	-0.915872	0.3606
TATO	0.051961	0.040204	1.292417	0.1974
SIZE	0.023568*	0.012343	1.909421	0.0573
FLEV	-0.094698***	0.028790	-3.289297	0.0011
R-squared	0.084642	Adjusted R-squared		0.067039
S.E. of regression	0.023906	F-statistic		4.808369
Prob(F-statistic)	0.000319			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

4.4.3 Fixed Effect Model

From table 4.7, the R-squared is valued at 0.7334, where there would be an increase in the profitability proxy, i.e. ROA by 73.3 percent upon the contribution by all the independent variables. The results also revealed that ROA would be reduced by 0.03 percent should the other variables remain static. The results shown that FATO is significantly and positively interrelated with ROA at 10 percent significant level, giving an increase of profitability by approximately 0.08 percent should FATO improved by 1 percent. On the other hand, FLEV is with a negative and influential relation with ROA, i.e. ROA would

decrease by 0.03 percent for every 10 percent increase in FLEV. Both variables promote the rejection of null hypothesis as the presence of the influence elements are evident. However, ASTA, TATO and SIZE showed an insignificant association with ROA, thus recommending the acceptance of null hypothesis. On top of that, ASTA is negatively related to ROA and both TATO and SIZE are positively related to ROA.

Table 4.7: Fixed Effect Model of ROA

Dependent Variable: ROA

Method: Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.027636	0.074593	-0.370492	0.7114
FATO	0.079840***	0.017713	4.507424	0.0000
ASTA	-0.018640	0.032887	-0.566775	0.5714
TATO	0.006709	0.028372	0.236452	0.8133
SIZE	0.004417	0.008377	0.527223	0.5986
FLEV	-0.030400*	0.018309	-1.660326	0.0983
R-squared	0.733420	Adjusted R-squared		0.683212
S.E. of regression	0.023722	F-statistic		14.60767
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

The R-squared is evaluated at 0.6023 using the fixed effect model as shown in Table 4.8, in which the profitability proxy, i.e. ROE would increase in value by 60.23 percent caused by the independent variables. The findings also revealed that if all the other variables remain unchanged, the ROE would be decreased by 0.074 percent. For this model, FATO is seen to be having a significant and positive association with ROE at 1 percent significant level and propose that a change in FATO by 1 percent would bring a favourable 0.18 percent towards ROE, consequently rejecting the null hypothesis.

The other variables have shown their insignificance towards ROE with ASTA and FLEV with negative relationship, whereas TATO and SIZE positively linked to ROE and resulting in accepting the null hypothesis.

Table 4.8: Fixed Effect Model of ROE

Dependent Variable: ROE

Method: Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.074074	0.156717	-0.472659	0.6369
FATO	0.179877***	0.037214	4.833562	0.0000
ASTA	-0.066915	0.069094	-0.968454	0.3339
TATO	0.054283	0.059608	0.910676	0.3634
SIZE	0.005928	0.017601	0.336830	0.7366
FLEV	-0.029458	0.038467	-0.765808	0.4446
R-squared	0.602251	Adjusted R-squared		0.527339
S.E. of regression	0.049838	F-statistic		8.039412
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

4.5 Diagnostic Tests

Before performing panel data regression, diagnostic tests are performed to see whether the assumptions of the classical linear regression are fully met or otherwise. Jarque-Bera normality test, multi-collinearity test i.e. the Variance Inflation Factor (VIF), Heteroscedasticity testing and Auto-Correlation using Durbin Watson being carried out using Eviews11.

4.5.1 Normality Test - Jarque-Bera (JB)

JB test is commonly used in determining the data skewness and kurtosis of data selected towards the normal distribution. The null hypothesis suggesting that the variables are normally distributed, whilst the alternative hypothesis presumes the variables are not normally distributed.

Results from Figure 4.1 revealed that the skewness of the data set was at 1.213229. According to Westfall, 2014, asymmetric distributions with longer left tail is negative skewed; whilst asymmetric distributions with longer right tail is positively skewed. In this case, the distribution of data is positively skewed due to the higher data score to the right or the mean of the data set is bigger than the median.

Meanwhile, a distribution's kurtosis tests its tail behaviour, which suggests its tendency to make discoveries far from the centre of its support. The results revealed that the kurtosis value is at 7.3104, but Westfall, 2014 mentioned that if the kurtosis value exceeds 3, the data selected has heavier tails compared to a normal distributed data and is a leptokurtic distribution.

JB test being performed to confirm the normality of data set's distribution and referring to the table above, the JB value is at 271.1753. This value is considered high and do not come from a normal distribution. In addition, the p value for JB test lies at 0.000, thus suggesting that the data are not normally distributed and the null hypothesis is to be considered.

On the other hand, Figure 4.2 results showed that the data set was skewed at 0.680936, thus indicating that the data is also positively skewed as the average of the samples are higher than the median. The kurtosis value of 5.3896 indicates the data have heavier tails as the kurtosis value exceeded 3 and is the leptokurtic type of distribution. The JB value

points at 83.84, a high and comes from an abnormal distribution, with the p value at 0.000. This means that null hypothesis is being selected as the data are considered not normally distributed.

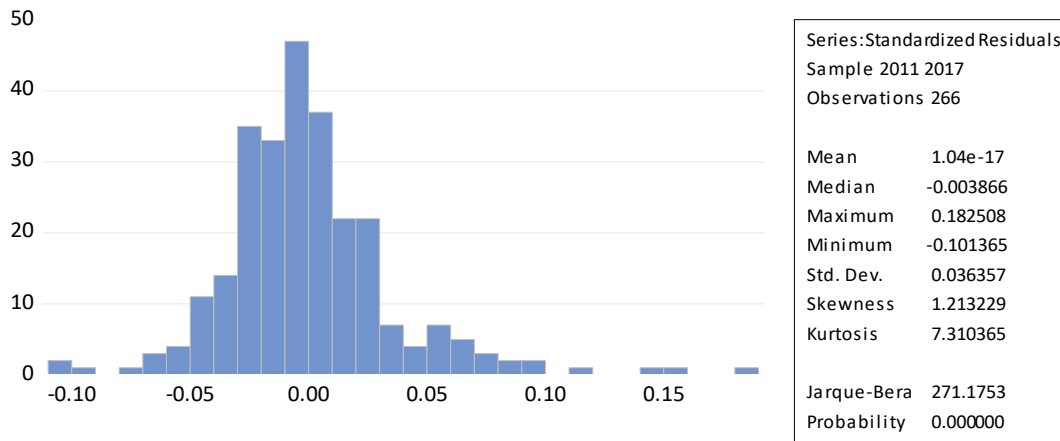


Figure 4.1: Normality Test (ROA)

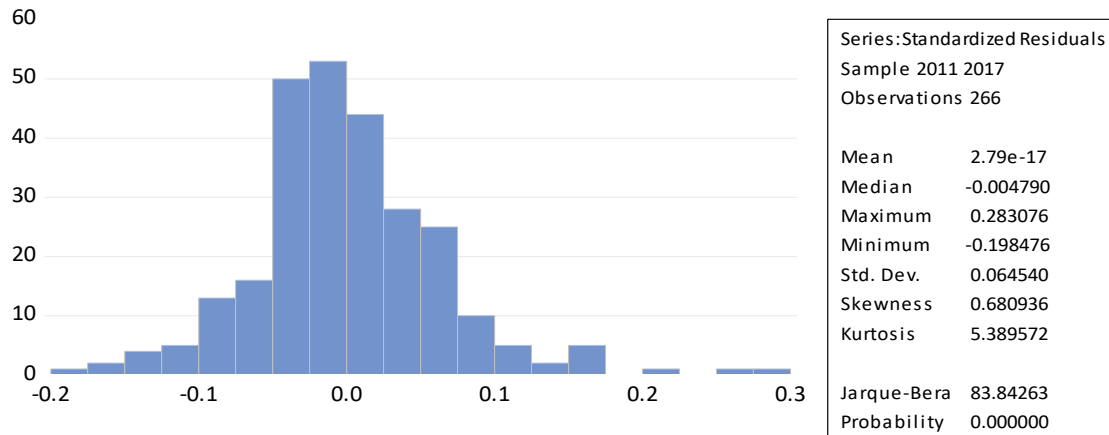


Figure 4.2: Normality Test (ROE)

Deakin (1976) and Barnes (2000) suggests the non-normally distributed data (financial ratios) should still be accepted as data have the tendency to be not normally distributed when compared against huge datasets. Taking into consideration, despite this research focusing on the construction sector, there is no doubt that the diversified construction businesses within the sector is inevitable and would have caused this issue to

emerge and non-normal data distribution is accepted as outliers were detected, caused by the difference of construction firms' performance and eliminating the outliers would mislead the overall results.

4.5.2 Autocorrelation Durbin Watson Test (DW)

DW test is aimed to evaluate the serial correlation of a particular form by the ability to spot formidable autocorrelation order and the lagging dependent variables and Table 4.9 shows the DW value for ROA.

Table 4.9: Durbin Watson Test (ROA)

Dependent Variable: ROA

Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.112486	0.041420	-2.715745	0.0071
FATO	0.008121	0.007082	1.146729	0.2525
ASTA	0.012335	0.023265	0.530204	0.5964
TATO	0.026976	0.016043	1.681416	0.0939
SIZE	0.020610	0.005006	4.116665	0.0001
FLEV	-0.101865	0.012030	-8.467446	0.0000
R-squared	0.255875	Adjusted R-squared		0.241565
S.E. of regression	0.036705	F-statistic		17.88076
Prob(F-statistic)	0.000000	Durbin-Watson stat		0.477938

The captured DW value is recorded at 0.479 and according to Gujarati and Porter, (2009), if the DW value falls between 0 and less than 2, it shows that there is an existence of auto correlation in the panel data. Field (2009), suggests that values under 1 or more than 3 are a definite cause for concern as it would lead to underestimation of the standard error thus giving a wrong interpretation on the significance of such relationship. Meanwhile, Table 4.10 indicates the ROE's DW value.

The captured DW value for ROE as per Table 4.10 is recorded at 0.691 and according to Gujarati and Porter, (2009), if the DW value falls between 0 and less than 2, it shows that

there is an existence of auto correlation in the panel data. Field (2009), suggests that values under 1 or more than 3 are a definite cause for concern as it would lead to underestimation of the standard error thus giving a wrong interpretation on the significance of such relationship.

Table 4.10: Durbin Watson Test (ROE)

Dependent Variable: ROE
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.249528	0.073527	-3.393672	0.0008
FATO	0.013977	0.012571	1.111851	0.2672
ASTA	-0.047419	0.041300	-1.148176	0.2520
TATO	0.056749	0.028480	1.992578	0.0474
SIZE	0.041341	0.008887	4.651690	0.0000
FLEV	-0.132674	0.021356	-6.212589	0.0000
R-squared	0.207358	Adjusted R-squared		0.192115
S.E. of regression	0.065157	F-statistic		13.60342
Prob(F-statistic)	0.000000	Durbin-Watson stat		0.691087

4.5.3 Multi-collinearity Test – Variance Inflation Factor

In testing the multi collinearity between the variables selected, all variables except the dependent variables were selected and tested the correlation among them and the result is as per Table 4.11 (multi collinearity test) and Table 4.12 VIF:

Table 4.11: Multi Collinearity Test

	FATO	ASTA	TATO	SIZE	FLEV
FATO	1.000000	-0.029905	0.243652	0.232008	0.152737
ASTA	-0.029905	1.000000	-0.164942	0.241269	0.195281
TATO	0.243652	-0.164942	1.000000	0.124717	0.011431
SIZE	0.232008	0.241269	0.124717	1.000000	0.168557
FLEV	0.152737	0.195281	0.011431	0.168557	1.000000

The results obtained revealed that the relationship between all the independent variables ranged between -0.164942 to 0.24652, and proves the non-existence of multi collinearity issues on the data set for both models as the values between the selected variables are all below 0.8, as per Kim (2019).

Another test used in confirming on the existence or non-existence of multi collinearity is by using the Variance Inflation Factors (VIF) as per Table 4.12. The result shows that the CVIF for the above variables are between 1.076661 and 1.156596. Kim (2019) quoted that if the CVIF value is between 5 and 10, multi collinearity exist but CVIF is unable to explain on the reason for the existence of such results obtained. But since the results are all below 5, it can be suggested that absence of multi collinearity on the data.

Table 4.12: Variance Inflation Factors (VIF)

Variance Inflation Factors

Included observations: 266

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.001716	338.7287	NA
FATO	5.01E-05	3.912624	1.134753
ASTA	0.000541	12.46666	1.143027
TATO	0.000257	9.725774	1.107781
SIZE	2.51E-05	379.6790	1.156596
FLEV	0.000145	8.824405	1.076661

Both tests used confirm the non-existence of multi collinearity issues and suitable to be used as when the VIF value is high, it inflates the variance of the regression coefficient and would increase the standard error of the regression coefficient as standard error is the square root of the variance. This would result in the reduction of the t-statistic and the regression coefficient being insignificant, thereby providing an insignificant coefficient of regression and an inaccurate prediction model.

The null hypothesis is therefore accepted and concluded on the non-existence of autocorrelation in the model. Both VIF values for the variance inflation factor are less than 10, demonstrating that the independent variables are not linearly related. It can therefore be stated that the model has no problem with multi-collinearity.

4.5.4 Heteroscedasticity

Heteroscedasticity can be viewed as if the regression model is inconsistent with the variance of errors as per Table 4.13 and Table 4.14.

Table 4.13: Heteroscedasticity LR Test (ROA)

Panel Cross-section Heteroscedasticity LR Test			
Specification: ROA C FATO ASTA TATO SIZE FLEV			
Null hypothesis: Residuals are homoscedastic			
	Value	df	Probability
Likelihood ratio	277.4987	38	0.0000
LR test summary:			
	Value	df	
Restricted LogL	504.6856	260	
Unrestricted LogL	643.4349	260	

The results showed that both models are having a p value less than 0.05, meaning reject the alternative hypothesis and accepting the data has heteroscedasticity issue. This could be caused by the large range of data between the highest and lowest value of each variables, and also it could be caused by the panel data used in the observation period.

Table 4.14: Heteroscedasticity LR Test (ROE)

Panel Cross-section Heteroscedasticity LR Test

Specification: ROE C FATO ASTA TATO SIZE FLEV

Null hypothesis: Residuals are homoscedastic

	Value	df	Probability
Likelihood ratio	205.8158	38	0.0000
LR test summary:			
	Value	df	
Restricted LogL	352.0289	260	
Unrestricted LogL	454.9368	260	

4.5.5 Breusch-Pagan Lagrangian Multiplier Test

The Breusch-Pagan Lagrangian Multiplier Test is intended to determine the presence of heteroscedasticity in order to select either Pooled OLS or Random Effects Model (REM) in the research study as per Table 4.15 and Table 4.16.

Table 4.15: Breusch-Pagan (BP) Lagrangian Multiplier Test – ROA

Effects Test	Statistic	d.f.	Prob.
Cross-section F	10.796668	(37,223)	0.0000
Cross-section Chi-square	273.058170	37	0.0000

Table 4.16: Breusch-Pagan (BP) Lagrangian Multiplier Test – ROE

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.983749	(37,223)	0.0000
Cross-section Chi-square	183.420408	37	0.0000

Results from both tables revealed that the p-value are both less than the significant value, thus is considered statistically significant. Hence, the sensible action is to reject null hypothesis; i.e. accepting REM as the more suitable model for the data set. The rejection of

null hypothesis shows the random effects model is the more suitable model to be used in the study as compared to the Pooled OLS.

4.5.6 Hausman Test

Since the results of Breusch-Pagan Lagrange Multiplier test suggests that the random effects model is the suitable model to be used, the next step is running the Hausman test to choose between the fixed effects model and random effects model, which is more appropriate to use. The result of Hausman test are illustrated in Table 4.17 and Table 4.18.

Based on Table 4.17, the null hypothesis is dismissed at a 1 percent level of significance. The following tests indicate that the p-value is 0.0032, less than 0.01 and statistically important. Therefore, the fixed-effect model is more suitable than the random-effect model to be applied in this analysis and the null hypothesis is rejected.

Table 4.17: Hausman Test (ROA)

Equation: ROA

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	17.819519	5	0.0032***

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

Table 4.18 indicates the p-value is recorded at 0.0005 and much lower as compared to the significant level at 1 percent. This requires the rejection of null hypothesis, and suggesting the fixed effect model is more appropriate as compared to the random effect model in determining the best model in describing the regression model.

Table 4.18: Hausman Test (ROE)

Equation: ROE

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	21.902427	5	0.0005***

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

Table 4.19 summarises the results of the panel regression analysis and the evidence of the most suitable model to be used in this study where ROA is the dependent variable.

Table 4.19: Summary of the Results of Panel Regression Analysis (ROA)

ROA	Pooled OLS	REM	FEM
C	-0.112486 -2.715745	-0.043816 -0.753056	-0.027636 -0.370492
FATO	0.008121 1.146729	0.035548 3.063745	0.079840 4.507424
ASTA	0.012335 0.530204	-0.007458 -0.268834	-0.018640 -0.566775
TATO	0.026976 1.681416	0.011996 0.542494	0.006709 0.236452
SIZE	0.020610 4.116665	0.010057 1.497186	0.004417 0.527223
FLEV	-0.101865 -8.467446	-0.060182 -3.911405	0.527223 -1.660326
Observation	266	266	266
LM Test	273.058170 0.0000 (REM is more appropriate)		
Hausman Test		17.819519 0.0032*** FEM is more appropriate	

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

Table 4.20 summarises the results of the panel regression analysis and the evidence of the most suitable model to be used in this study where ROE is the dependent variable. The results conform on rejecting the null hypothesis as the p-values for Hausman test

conducted on both dependent variables, ROA is 0.0032 and ROE is 0.005, which is significant thus selecting the Fixed Effect Model as the suitable model to be used in this research and being elaborated further.

Table 4.20: Summary of the Results of Panel Regression Analysis (ROE)

ROE	Pooled OLS	REM	FEM
C	-0.249528 -3.393672	-0.132510 -1.255476	-0.074074 -0.472659
FATO	0.013977 1.111851	0.053290 2.673277	0.179877 4.833562
ASTA	-0.047419 -1.148176	-0.048055 -0.915872	-0.066915 -0.968454
TATO	0.056749 1.992578	0.051961 1.292417	0.054283 0.910676
SIZE	0.041341 4.651690	0.023568 1.909421	0.005928 0.336830
FLEV	-0.132674 -6.212589	-0.094698 -3.289297	-0.029458 -0.765808
Observation	266	266	266
LM Test	183.420408 0.0000 (REM is more appropriate)		
Hausman Test		21.902427 0.0005*** FEM is more appropriate	

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level

4.6 Corrected Fixed Effects Model Results

The main objective of this research is to investigate the relationship between non-current assets and firms' profitability for 38 firms from the construction sector listed in Bursa Malaysia for a period spanning from 2011 to 2017. This research also aims to examine and clarify evidence based on the hypotheses, i.e. giving an insight on the connection between firms' profitability and non-current assets. Eventually, the hypotheses are formulated to explore the relation between the firms' profitability and the non-current assets, quantified by the return on assets and return on equity. Below is the discussion on the outcome of the most suitable regression model to be applied, i.e. the fixed effect model.

Both the regression models, i.e. ROA and ROE were having issues with the normality test, i.e. data are not equally distributed, the auto-correlation and heteroscedasticity issues which may lead to underestimates of standard error thus giving a wrong impression and biasness on the significance of variables.

There are a few options in rectifying the issues above, such as adding more samples towards the population, transform of data by using log and the last option is to ignore it. Referring Knaub (1996), the best option to rectify panel data is not to retransform the data by using log as it could be considered as manipulating the data and results may not reflect the actual scenario. Hence, the comparison of an estimates to its standard error would be suggested and that would be using the white diagonal standard errors test to be applied. In order to rectify the issues, the regression models are being corrected using the white diagonal standard errors test and results being explained below.

Table 4.21: Corrected Fixed Effect Model of ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.112486	0.031475	-3.573851	0.0004
FATO	0.008121*	0.004255	1.908602	0.0574
ASTA	0.012335	0.016253	0.758935	0.4486
TATO	0.026976	0.016835	1.602369	0.1103
SIZE	0.020610***	0.003978	5.180724	0.0000
FLEV	-0.101865***	0.013317	-7.649170	0.0000
R-squared	0.255875	Adjusted R-squared		0.241565
S.E. of regression	0.036705	F-statistic		17.88076
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

The corrected regression model for ROA is estimated as follows, i.e., $ROA = -0.112486 + 0.008121 \text{ FATO} + 0.012335 \text{ ASTA} + 0.026976 \text{ TATO} + 0.020610 \text{ SIZE} -$

0.101865 FLEV and summarizes the relationship between all the independent variables and the dependent variable that have been corrected derived from the best model selected earlier.

This corrected model suggests that the profitability proxy, ROA would be reduced by 0.11 percent should the other independent variables be static or at zero. However, should the other variables, i.e., FATO, ASTA, TATO, SIZE and FLEV change accordingly, it could be estimated that ROA would be increased by 25.6 percent. In short, the independent variables selected statistically would have an impact towards the ROA by up to 24.2 percent.

Referring to Table 4.21, it is evident that FATO is positively and significantly has an impact ROA at 10 percent level, i.e., an improvement in FATO by 10 percent, ROA would be favourable by 0.08 percent. This result establishes on the importance of investments in non-current assets as the move would make the firms' shareholders happy with the increment in the return of the assets.

This similar result on the significance of FATO towards ROA were also corroborated by several researchers done by Al-Ani (2013), Balatbat et al. (2010), Jindal et al. (2017), Pouraghajan and Malekian (2012), and Purba and Bimantara (2020), which also related to high non-current assets utilization sectors. From the observations made, the significance of relationship between FATO and ROA mainly is caused by the high utilization of modern and the latest non-current assets in the construction sector that enable the firms to explore and gain advantage of either large or special construction projects. Thus statistically, firms with higher non-current assets would have competitive advantage over the rest of the field and with the combination of proper management non-current assets, firms would be able to churn higher asset returns and ultimately get higher profits.

But looking at the range of ROA for the Malaysian construction sector, firms are unable to generate sufficient revenue from the non-current assets as the ROA ratio for the

samples ranging from -0.08 to 0.24, with an average ROA of 0.035. However, the study discovered that the mean of FATO for the industry is at 0.53 sen for every Ringgit spent, hence giving an indication that the high FATO portion has been eaten up by either the financing costs and leverage or the running costs of the operations in acquiring modern and sophisticated non-current assets in fulfilling the needs of the industry. Looking at the FLEV for the industry, it is evident that FLEV is having a significant inversed relationship with ROA with 1 percent increase in FLEV, ROA would be reduced by 0.102 percent and this could be the answer why firms in the construction industry are having low ROA as compared to other industries.

On the other hand, this result also revealed that non-current assets are unable to generate higher turnover, i.e., average ROA is at 53 percent, thus suggesting the existence of possibility on the inefficient utilisation of the non-current assets, obsolete or outdated non-current assets and acquisition of non-current assets are not intended to generate income. This similar observation is also reported several researchers done by Azadi (2013), Balatbat et al. (2010), Dhillon and Vachhrajani (2012), Iqbal and Mati (2012), Jamali and Asadi (2012), Jindal et al. (2017) and Reyhani (2012), where the non-current assets were not being properly utilized in generating returns. On the other hand, Kotsina and Hazak (2012) and Okwo et al. (2012) agreed that the investment in fixed asset does not have any strong and statistical impact on the profitability.

The result also revealed that SIZE is positively and significantly has influence on ROA at 1 percent. This statistically means that an increase in the firms' size by 1 percent, ROA would be improved by 0.021 percent, i.e., an increase in returns (ROA) could be caused by the change of firms' size. Having that in mind, it could be concluded that the firms in the Malaysian construction industry's size big with the average of 8.75, while the lowest is at

7.42 and a slight change in the firms' size would have a positive impact towards the firms in the sector.

Large sized firms are deliberated as having competitive edge over smaller sized firms as larger firms would normally have the capability in meeting high capital requirements thus making them to have the prospect in generating returns from the opportunity gathered. This also could be explained with the high average FLEV (52.1 percent) in the sector, as firms are getting favourable credit lines with the size advantage of the firms.

On top of that, large firms normally have better possibility of obtaining financing from external parties including financial institutions and creditors at a much lower borrowing costs. This would result large firms in lowering their financial obligations and interest expenses thus increasing the firms' profits due to the favorable credit worthiness, the reduction of firms' insolvency possibility, hence portraying a favourable image towards interested parties in business dealings. This is championed by Alghusini (2015), Duchin et al. (2010) and Korajczyk and Levy (2003), inferred that larger firms have more financial freedom as compared to smaller firms as larger firms seemingly have better access to financial markets than do small firms. Abbasi and Malik (2015), John and Adebayo (2013) and Vijayakumar and Tamizhselvan (2010) explained the relationship between SIZE and ROA and concluded that the size of firms gives huge impact on the success of firms and the rights of the shareholders.

No doubt firms' size is giving favourable advantages as mentioned in the paragraph above, but a key point to remember that larger firms have larger commitments and obligations to be fulfilled thus giving them more cash flow issues during economic downturn or during a crisis as compared to the smaller firms. This is upheld by Vithessonthi and Tongurai (2015) as they suggested that larger firms were more financially constrained than

smaller firms during the financial crisis. Overall, results conclude that large growing companies could manage their assets efficiently command higher profits. Contrarily, studies by Ahmad et al. (2017) and Nireesh and Velnampy (2014) revealed that a bigger sized firm has no impact towards the profitability of construction firms.

FLEV is negatively related and has an influential relation with ROA, i.e., ROA would decrease by 0.101 percent for every 1 percent increase in FLEV. This result indicates that firms with higher leverage or highly geared would end up in having a lower return of assets. Firms with higher leverage would need to serve the interest obligations and other commitment fees that may arise from the disbursed financing and would increase the possibility of cash flow constrain, making it impossible for firms to run the businesses as they should be. This permits lucrative businesses apply the pecking order theory in the area of financing, i.e., the more profitable a business is more likely to lower their debts by limiting the external financing, instead opt for the internal financing. The result obtained in this study is in an agreement with various findings determined by Al-Jafari and Al-Samman (2015), Balakrishnan (2016), Bhayani (2010), Ebaid (2009), Karim et al. (2012), Khan (2012), Sheikh and Wang (2013) and Zeitun and Tian (2007). Thus, this notion considers that higher leverage or debt would hurt the firms' income due to the increased the required rate of return as the firms could be powerless to trade-off between of the benefits and the costs of debts associated to the financing.

On the other hand, a study by Smith et al. (2012) revealed that firms with higher leverage would create a better return on assets as they were competing aggressively in generating higher revenue and giving high returns towards the shareholders.

The results also revealed that ASTA and TATO have no significant impact towards ROA, with both variables having a positive relationship with ROA. The positive and

insignificant correlation between ASTA and ROA in this study means that the tangibility of assets has no power towards determining the profitability of firms. This result is upheld by Do et al. (2020), revealed that the significance impact of assets tangibility and total asset turnover are not significant, thus giving an unapparent impact towards the profitability. Study by Al-Jafari and Al-Samman (2015) determined that assets tangibility has no statistical significant impact towards ROA but has influence on net profit margin. This proves that high tangibility of assets could have an adverse impact on the firms' performance as the financing costs of such acquisition would have impact on the income and high tangibility of assets also do not guarantee high returns on assets.

Alternatively, Chinaemerem and Anthony (2012) and Vatavu (2015) have inferred that the connection between the firm's asset tangibility and ROA is negative and significant which indicates that businesses with a strong tangibility ratio have a lesser financial return due to impact of the cost of borrowings in acquiring the tangible assets. Akintoye (2008) debates that firms with more outlay in tangible assets would enjoy lower financial distress costs as compared to firms with reliance on intangible assets.

TATO and ROA statistically have a positive but insignificant impact as the p-value is greater than 0.10. This result is backed by the study done by Onaolapo and Kajola (2010), stating that positive relationship existed between profitability and total assets turnover but without significant impact. Al-Ani (2013) added and pointed out that the asset structure, i.e. fixed asset turnover, current asset turnover and total asset turnover had no influence on ROA and profitability for businesses in Oman. Contrary, Muritala (2012) and Poughrajan and Malekian (2012) revealed the existence of a positive and significant relationship between ROA and asset turnover at 1 percent significance level. This is seen as the results of the

existence of high business activities which is represented by high assets turnover, leads to a higher profitability.

Table 4.22 is the corrected predicted regression model for the second dependent variable, i.e. ROE may be best summed up as follows: $ROE = -0.249528 + 0.013977 \text{ FATO} - 0.047419 \text{ ASTA} + 0.056749 \text{ TATO} + 0.041341 \text{ SIZE} - 0.132674 \text{ FLEV}$. This equilibrium infuses the relationship between all independent variables and the dependent variable from the best previously selected model.

Table 4.22: Corrected Fixed Effect Model of ROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.249528	0.055769	-4.474327	0.0000
FATO	0.013977*	0.007825	1.786305	0.0752
ASTA	-0.047419	0.035741	-1.326735	0.1858
TATO	0.056749*	0.029641	1.914531	0.0566
SIZE	0.041341***	0.006769	6.107475	0.0000
FLEV	-0.132674***	0.020992	-6.320305	0.0000
R-squared	0.207358	Adjusted R-squared		0.192115
S.E. of regression	0.065157	F-statistic		13.60342
Prob(F-statistic)	0.000000			

***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level.

From the table, the R-squared is estimated at 0.1921 after selecting the corrected fixed effect model and designates that 19.2 percent of ROE value would increase triggered by the selected independent variables. Contrarily, should the independent variables remain constant, ROE would be reduced by 0.25 percent. Statistically, should there be any relevant variable is added to the model, the value of R-squared will be adjusted to 20.74 percent.

This model revealed that FATO is predicted to have a positive and influential relationship with ROE at 10 percent significant level. This proposes that ROE would have a desirable impact by 0.014 percent for every 10 percent of increase in FATO. This signifies

that the firm's non-current assets have a significant contribution to the higher generating of revenue flows thus resulting in improving the ROE of the firm. This result is similar to the result attained by Alarussi and Alhaderi (2018), Azad et al. (2018) and Dada and Ghazali (2016), where the fixed asset turnover ratio is positively and significantly correlated to ROE. Li (2004) suggested that non-current assets have a negative association with productivity, contrary to other reports. Divergently, Al-Ani (2013) has found out that fixed asset turnover ratio does not have any impact towards profitability ratios, i.e. ROA and ROE for construction firms in Oman and his results was consistent with Iqbal and Mati (2012) conclusion on the non-current assets do not lead to the increase in ROA and ROE.

Taking into consideration that both profitability proxies, i.e. ROA and ROE in both scenarios are significantly and positively related to FATO, we could conclude that the non-current assets is considered as one of the major factors bearing impact for firms specifically in the construction sector in Malaysia. The effect motivates businesses to improve their productivity (as fixed asset turnover ratio tests performance) and to manage their assets decorously in order to increase their turnover, revenue and hence their profitability.

From the results, ASTA does not have the influence on the ROE as the p-value is at 0.1858, meaning there would be no impact towards firms ROE should the management decide to increase the tangibility of the firm's assets. The results are cemented by study done by Do et al. (2020), where that the impact of assets tangibility and total asset turnover are not significant, thus giving an unapparent impact towards ROE. This result was also highlighted by Bokhari and Khan (2013) in the study on the non-financial firms listed in Pakistan and also by Raheel and Shah (2015) in the research focusing on oil and gas companies in Pakistan. Chinaemerem and Anthony (2012) have deduced that the connection between asset tangibility and ROE is positive but insignificant. Muritala (2012) found that

the ROE and asset tangibility relationship is positive, but not crucial. Remarkably, this positive relationship provides a significant indication that the companies analysed could not manage the performance of their fixed asset composition diligently over the entire asset, demonstrated in both profitability. Al-Ani (2013) has shown that the entire assets efficiency ratios that is non-current assets, current assets and total asset turnover ratios do not have any impact towards profitability ratios, i.e. ROA and ROE which is consistent with the results from this research.

Meanwhile, TATO has indicated to be having a positive direction link and with sufficient influence to affect the value of ROE, i.e. a 10 percent increase in TATO would result in improving ROE by 0.057 percent. This was supported by the study done by Al-Ani (2013), Ali and Saudi (2109), and Vintila and Duca (2012) revealed on the positive and significant impact between ROE and TATO. Dada and Ghazali (2016), Muritala (2012), and Pouraghajan and Malekian (2012) revealed the existence of a positive and significant relationship between ROE. The rationale behind the positive and significant relationship between TATO and ROE is caused by the consideration on the significance of the massive numbers of economic activities executed and being converted into high TATO, giving a picture the assets being utilized effectively and ended up in giving higher and desirable ROE outcomes.

Contrarily, Azad et al. (2018) in their study discovered the strong negative impact relationship between TATO and ROE in the Pakistani oil exploration industry due to the high costs of assets required by the industry dampened by the weakening price in crude oil has taken its toll on ROE. However, Do et al. (2020) and Ulla et.al. (2020) discovered that the total asset turnover has an insignificant connection in a negative manner with ROE.

Perversely, Hung et al. (2002) have found that while high income is significantly connected to assets, in Hong Kong it is negatively associated to profitability.

Mweta and Kipronoh (2018) and Warrard and Omari (2015) discovered the presence of positive correlation connecting ROE with variables of asset turnover ratio, firm age and assets tangibility ratio but is insignificant on their studies over the Jordanian service sectors. Azad et al. (2018) and Burja and Marginean (2014) discovered a strong and negative relationship between TATO and ROE.

The results also indicated that FLEV is negatively correlated with ROE and has weightage in affecting the firm's profitability, i.e. ROE would decrease by 0.133 percent for every 1 percent increase in FLEV. This attests that higher FLEV would reduce the profitability of firms due to the financing costs incurred from the borrowings absorb the profits portion. This is consistent with the results attained by Alarussi and Alhaderi (2018), Gleason et al. (2000), Hammes and Chen (2004), Majumdar and Chhiber (1999), Simerly and Li (2000), Victor and Badu (2012), and Zeitun and Tian (2007) where the FLEV has an inverse and significant impact towards ROE. The result reveals that firms with high dependency on external funds would result in lowering their ROE due to the higher costs of financing affects the firms' profitability. This means that executives of firms have to think hard on their choices in obtaining financing internally or externally as the decision would have a direct impact towards the desired bottom-line of firms.

On the other hand, Mule and Mukras (2015) in their study on public listed forms in Kenya revealed that any variation in financial leverage would not cause any alteration of ROE value. Zeitun and Al Kuwari (2012) learned that FLEV is found to have an inverse relation with insignificant impact on GCC firms' performance measures used, i.e. ROA and ROE. The insignificance of corporate leverage (LEV) shows that the result of firms in the

GCC is inconsequential to their capital structure, which supports the argument of Modigliani and Miller (M&M) (1958). Meanwhile, there are also researchers with the finding of positive and significant association between leverage and return on equity as discovered by David and Olorunfemi (2010), Dawar (2014), Salim and Yadav (2012) and Vu et al. (2019).

From the table, SIZE statistically has significant bearing towards ROE and is positively related. In short, there is no justification for larger firms to get more returns and eventually increases the shareholders' wealth. This result is endorsed by the research done by Vinasithamby (2015) revealed that firms' size has a significant and a positive relationship with ROE. This result was also supported by prior studies by Zeitun and Al Kuwari (2012) reported that firms' size has a positive impact on firms' performance measures, i.e. ROA and ROE, at a significant level of 1 percent and coherent with former discoveries including Gleason et al. (2000), Niresh and Velnamby (2014), Pasiouras and Kosmidou (2007) and Zeitun (2009) concluded there was no revealing positive relationship between firm size and profitability for manufacturing firms listed in Sri Lanka. Perversely, Zeitun and Al Kuwari (2012) reported that firms' size has a positive impact on firms' performance measures, i.e. ROA and ROE, at a significant level of 1 percent and coherent with former discoveries including Gleason, et al. (2000), Pasiouras and Kosmidou (2007) and Zeitun (2009).

It could be concluded that larger sized firms are able to get higher returns as they would be able to achieve the economic scale of businesses, as larger firms would have higher advantages in providing or sourcing resources in their economic activities, thus giving them superfluous advantage over competitors and giving higher possibilities of making higher returns. Larger firms also enjoy the benefits of receiving financial means from external parties, giving them higher financial resources advantage especially in industries that are capital intensive such as construction, manufacturing, mining, oil and gas and others.

4.7 Summary of Hypotheses

This section summarises the hypotheses that have been drawn up to test the bearing and the criticality of the relationship between the variables selected, giving some input and insight on the matter pertaining to the construction firms' performance in Malaysia. Below is the list of hypotheses, the statistical results obtained and the decision in concluding on accommodating or discarding the said hypotheses.

Table 4.23: Summary of Hypotheses and Results of the Study

Hypotheses and Results of the Study	
H ₁	There is a positive significant relationship between fixed assets turnover (FATO) and firms' performance. The results obtained supports the hypothesis where FATO has a positive and significant influence towards both ROA and ROE at 10 percent significant level.
H ₂	There is a significant negative relationship between assets tangibility (ASTA) and firms' performance. The results underlined that ASTA has no significant relationship between both ROA and ROE as the firms' performance proxies, thus rejecting this hypothesis.
H ₃	There is a positive significant relationship between total assets turnover (TATO) and firms' performance. The outcome from this study revealed that a positive significant relationship existed between TATO and ROE at 10 percent level which supported the hypothesis. On the other hand, TATO and ROA has no significant relationship, thus rejecting the hypothesis.

4.8 Conclusion

This chapter basically intend to uncover the relationship between all selected independent variables against the firms' performance proxy, i.e. ROA and ROE for a total of 38 construction firms in Malaysia from 2011 up to 2017. This is in attempt to analyse, provide answers and reasoning on which theory would be suitable to explain the relationship between the so called assets variables versus the firms' performance variables. The followings are the results based on the most suitable regression model applied, i.e., the fixed effect model.

H₁: There is a positive significant relationship between fixed assets turnover (FATO) and firm' performance.

The statistical results propose that FATO which is used as a measure on the firms' efficiency has influence over the firms' performance. Interestingly, both ROA and ROE has a significant and positive impact towards the change in the FATO. Thus, this hypothesis is accepted and proves with the ability to improve the fixed assets turnover ratio, firms' performance in terms of profitability measured using ROA and ROE would increase. From the data gathered, the mean for FATO was approximately 0.54, and this could be an indicator for the firms in the construction sector to further improve their FATO. Since the empirical evidence suggests that FATO has a positive and significant influence on both ROA and ROE as performance indicators, any firms with the ability to further push their FATO would attain better profits.

From the results of the study, the average fixed assets turnover was recorded at approximately 53sen for every RM1 spent on fixed assets. Statistically, the average FATO in the Malaysian construction sector is considered acceptable, as the higher the ratio, the better the assets is being utilised in generating revenue. Since the turnover ratio gauges the

efficiency of firms in managing resources to create revenue, obviously high turnover ratio is desired as it shows the state of the firms' business operations.

On the other hand, the sector's average ROA is at 3.5 sen for every RM1 spent on assets and average ROE is at 5.8sen for every RM1 invested in equity. The notable differences between the profitability proxies (ROA and ROE) average values and the average assets turnover value suggested that firms' in the sector faced fierce pricing competition due to the high escalation of direct material costs and the financing costs used in sourcing out the non-current assets. This revealed that the low profitable proxies is the consequences for firms to acquire non-current assets, where higher non-current assets acquisitions would reflect a desirable high FATO but at the same time reflecting a low ROA and ROE. Thus, it could be concluded that firms with high FATO could afford of having a low ROA and ROE, and firms with low ROA and ROE could not afford to have low FATO. Thus, the result of the study supports the hypothesis fixed asset turnover ratio has significant impact towards the firms' performance measured by ROA and ROE.

H₂: There is a significant negative relationship between assets tangibility (ASTA) and firm' performance.

Results from the research revealed that the tangibility of firms' assets has no significant influence towards the firms' performance and both models tested shown that ASTA has a negative coefficient with ROA and ROE. This results interpreted that the tangibility of assets does not have influence on the firms' performance in the construction sector, thus giving valuable information to managers that high assets tangibility does not guarantee high returns, i.e. by increasing the ASTA percentage to above the mean value (approx. 32 percent) has no effect towards profitability. The empirical result attained, i.e. tangibility of assets is non influential towards firms' performance, as per inference presented

by Al-Ani (2013), Al-Jafari and Al-Samman (2015) and Do et al. (2020). The outcome of the study rejects the hypothesis that assets efficiency measured by assets tangibility has no impact on the firms' profitability.

H₃: There is a positive significant relationship between total assets turnover (TATO) and firm' performance.

The turnover ratio of the entire assets statistically bears influence on ROE for the construction firms' performance with a positive note. This vindicates that any change in the overall structure of assets has impact towards the ROE received by construction firms but not for ROA.

Despite of having a mixed results on the firms' performance, the improvements in achieving higher TATO by managers should be the main agenda as the significance level of ROE towards TATO was at 10 percent level and could be further enhanced.

CHAPTER 5

CONCLUSION

5.1 Introduction

This final chapter sums up the deliberations in the previous chapters and seek to present necessary recommendations suitable with the outcomes for the firms in the Malaysian construction sector. Section 5.2 would summarise the results and the deduction of this study. Section 5.3 would then discuss on the possible and suitable recommendations, and followed by the limitations and suggestions for future study in the last section.

5.2 Summary of the Result

This study is intended to in investigating the relationship between the management of non-current assets structure and firms' profitability, specifically for the construction sector in Malaysia. For the research purpose, a total of 38 construction firms listed in Bursa Malaysia was selected over a 7-year period from 2011 to 2017. Financial data were obtained from the Eikon Datastream, Bursa Malaysia and the annual reports of the firms. In testing and analysing the data gathered, a descriptive statistic, correlation and coefficient analysis and panel regression analysis were used which includes the Pooled Ordinary Least Square (OLS), Random Effect Model, Fixed Effect Model. These models were tested with the diagnostic tests consists of the Jarque-Bera normality test, Variation Inflation Factor (VIF) Multi-correlation test, heteroscedasticity White Test and Durbin Watson Autocorrelation test. In selecting the best model that suits the data set, tests include the Breusch Pagan Lagrangian Multiplier test (in choosing either the Pooled Ordinary Least Square (OLS) or Random Effect Model) and the Hausman test for opting either the Random Effect Model or the Fixed Effect Model. However, the selected model has gone through a correction mode

after the original models were found to be having auto correlation and heteroscedasticity issues by applying the white diagonal test to avoid biasness on the results.

In estimating the relationship between the effects of the non-current assets structure towards firms' profitability, the selected independent variables are fixed assets turnover ratio (FATO), assets tangibility (ASTA) and total assets turnover ratio (TATO) whereas the firms' profitability are presented by return on assets (ROA) and return of equity (ROE). The control variable selected are the firm size (SIZE) and the financial leverage of the firms (FLEV). The outcome of the study are recapped below.

The empirical results revealed that FATO has a positive relationship with both the profitability proxies, i.e. ROA and ROE and has significant impact towards both ROA and ROE. This statistically proves that an increase in FATO, the profitability of firms' measured using ROA and ROE would also swell. This results are consistent and in line with previous studies done by Iqbal and Mati (2012), Jamali and Asadi (2012), Jindal et al. (2017), Nguyen (2019), Pouraghajan and Malekian (2012) and Reyhani (2012). No doubt, FATO enables the measurement of the non-current assets efficiency by gauging the revenue generated from each Ringgit spent on non-current assets, explicitly for the Malaysian construction sector, FATO is relatively still low, ranging from RM 0.04 to RM 2.78 per Ringgit spent on non-current assets. Hence, based on the results, the Malaysian construction firms are not efficiently optimising the utilisation of their non-current assets due to the presence of low FATO, resulting firms unable to yield better bottom-lines. This is consistent with the study done by Dillon and Vachhrajani (2012) concluding the non-current assets not being utilised efficiently in producing net profits.

No doubt that high acquisition and possession of non-current assets would be desirable to firms as this enable firms to venture and explore new business possibilities that

would provide high returns but firms need to be aware that such high non-current assets possession would come with the price in firms' high gearing. Yes, firms would be able to get new and more financing as the non-current assets would be able to be used as collateral, entitled to capital allowances in the tax computation, but firms need to be attentive with the globalisation and the competitiveness of the Malaysian construction industry today. This would give rise to the risk of liquidity problems due to the financing and high upkeep of non-current assets costs and this proves that the pecking order theory clearly indicates this scenario.

Interestingly, the results also revealed that assets tangibility has no significant impact towards the firms' performance indicators in this research, i.e. ROA and ROE. This shows that the tangibility of assets is not a factor in influencing firms' performance as lease of non-current assets is an option for firms not willing or against the idea of non-current assets possession. The non-significant results was also highlighted by previous researchers such as Al-Ani (2013), Al-Jafari and Al-Samman (2015), Do et al. (2020) and Okwo et al. (2012). On the extreme note Masood et al. (2017) suggested that tangible assets are insignificant in determining business returns and the income generator has switched to the intangible assets.

On the other hand, total assets turnover ratio (TATO) have an insignificant impact towards both of the firms' profitability, i.e. ROA but is positively significant with ROE. Remarkably, external financing would be the cause of difference between both profitability proxies results as the average of the Malaysian construction industry leverage is at 52 percent, with the highest leverage recorded at 126.5 percent. The need of high technology non-current assets in gaining competitive advantage would normally take its toll to the firms in the early stage due to the high capital outlay thus giving rise to the need for some firms to having their operations funded by external parties.

Overall, the findings indicate greater confidence in the pecking order theory. This result is also consistent with Agyei and Owusu (2014), Chen et al. (2012) and Fama and French (2012) that support the pecking order theory. This suggests that the relevance of the pecking order theory in the non-current assets as the option of using debt over the internal funds. If the company's internal resources is limited to the financing of investments and dividends, the company will have access to external funding. Thus, this study confirmed that the external funding priorities will take precedence over the issue of debt in relation to equity.

5.3 Policy Recommendations

This study focuses on analysing the relationship between non-current assets structure and firms' profitability, by gauging the efficient utilisation of non-current assets. Construction sector is being selected due to the significant growth and among top GDP change percentage in the Malaysian GDP from 2011 to 2017, and not forgetting the high value of investments in the non-current assets. This is due to the technological advancements in the equipment used in the sector enables firms' to create competitive advantage, cutting working time, reducing number of workforce and much more. These capital upfront investments are significant and require a long repayment period and a longer period of returns. This raises the risk of firms' caught in financial constraints due to poor returns and unable to sustain the business operations for a period of time. Thus, a transformation policy in managing the assets structure is recommended, aiming firms to avoid unwanted business financial difficulties by maximising the utilisation of the non-current assets.

First, it is recommended that the government to provide backing towards the local construction firms by awarding a certain percentage of construction projects. With such backing, the non-current assets owned by the constructions firms could be further utilized, thus giving a better non-current assets turnover and resulting in a higher profitability. In

addition to the backing by the government, it is also suggested that the government to hand out incentives encouraging construction firms to invest on non-current assets that are equipped with the latest technology that could improve construction firms' productivity by reducing working hours and saving operations costs such as fuel, wages, labour and other unforeseen costs. On the bright side, new equipment based the latest developed technology may have the answer on reducing the carbon dioxide emission that would harm the environment at large.

Next, the low assets ratios attained by the firms indicates the existence of issues with the utilization of the non-current assets. It is suggested that management should develop a blueprint on the utilization of the non-current assets, covering the short, medium and long term. The blueprint enables firms to manage their non-current assets fleet according to the business model and needs. Thus, actions such as acquisition, refurbishment, replacement, value engineering and relocation of non-current assets that permits firms to raise the non-current assets utilization.

Third, in order to increase the assets turnover and activity ratios, it is suggested that management should promote continuous education and training program for the non-current assets operators and also to establish specialized engineering team focusing on non-current assets maintenance and technical issues. These programs would enhance the familiarity and handling skills of the non-current assets operators and offer a quick solution internally in resolving issues with the machinery within a shorter period.

Finally, the management is recommended to fine tune the usability and the availability of the non-current assets and improving the quality of operations. This includes combating down time, idle time, setting up time and output times by improving process

controls, reduce office bureaucracy and complicated contracts, hence increasing non-current assets effectiveness. This process requires objective and proper tracking and monitoring of each and single non-current assets designed to toughen the quality management standards and improving the key performance index (KPI's), foiling process errors and detecting skills and abilities of the employees.

5.4 Limitation and Suggestions of Future Study

This study has been focusing on the Malaysian construction firms listed in Bursa Malaysia as a whole, and excluding firms with insufficient financial statements throughout the 7 years of the sampling period. This generalisation ignores the authorised share capital and the issued and paid-up capital of the firms, hence the actual size of the firms based on the share capital are not taken into consideration. For future study, it would be reckoned that construction firms should be categorised based on their value of their authorised, issued and paid up capital so proper comparisons could be made within the same category. The author would also suggest further researchers to make comparison on the firms' performance based on the economic scenario, i.e., boom, crisis, recovery period and such so that the pattern of the firms' performance could be further enhanced based on the economic situation. Further studies could also focus on other sectors with high capital intensity such as the manufacturing, transportation and logistics and others and provide significant GDP percentage to Malaysia.

This study also did not consider the economic factors giving impact towards the profitability of the selected firms such as GDP, inflations, interest rate and corporate income tax rate. Thus, the outcome from this study portrayed a significant influence towards the internal users of the financial statements rather than the external users. It would be beneficial

if the future study would be able to include the external factors mentioned above so that the outcome would be more meaningful.

5.5 A Remark

This study examines the impact of the non-current assets on the performance of firms in the Malaysian construction sector. The methods employed in this study include descriptive and correlation analysis and fixed effects model in examining the research objectives as per Zikmund et al. (2013). Basically the Fixed Effect Model is the most suitable model in determining the relationship between the impact of the non-current assets towards the Malaysian construction firms' performance. The findings are in-line with the studies done by Iqbal and Mati (2012), Jamali and Asadi (2012), Jindal et al. (2017), Nguyen (2019), Pouraghajan and Malekian (2012) and Reyhani (2012) with regards to the impact of FATO towards the ROA and ROE. Meanwhile, the significance of TATO towards ROE are supported by Al-Ani (2013), Ali and Saudi (2019), Vintila and Duca (2012). The results obtained have answered the research questions set in determining, examining and assessing the impact of the non-current assets towards the Malaysian construction firms' performance. The results also would be essential to various parties responsible for regulating, the industry players and also the existing and potential investors enabling them to focus on the main priorities in achieving the individual, corporate and the country goals.

REFERENCES

- Abbasi, A., & Malik, Q. A. (2015). Firms' size moderating financial performance in growing firms: An empirical evidence from Pakistan. *International Journal of Economics and Financial Issues*, 5(2), 334-339.
- Abdel Shahid, S. F. (2003). Does ownership structure affect firm value? Evidence from the Egyptian stock market. *SSRN Electronic Journal*, 1(3), 1-19
<https://doi.org/10.2139/ssrn.378580>
- Abdul Rahman, H., Berawi, M.A., Berwai, A.R., Mohamed, O., Othman, M., & Yahya, I.A. (2006). Delay mitigation in the Malaysian construction industry. *Journal of Construction Engineering and Management*, 132(2), 125-133.
- Abdul Rahman, H., Mohd Rahim, F.A., Hamid, M., & Zakaria, N. (2005). Beyond basic: the potential role and involvement the QS in public projects – an observation. *QS National Convention 2005: Sustaining the Profession – Towards Diversification*. August 10-11, Kuala Lumpur, Malaysia, 10-18.
- Abdul-Rahman, H., & Alidrisyi, M. N. (1994). A perspective of material management practices in a fast developing economy: The case of Malaysia. *Construction Management and Economics*, 12(5), 413-422.
<https://doi.org/10.1080/014461994000000051>
- Abidin, Hasanuddin Z., Andreas, H., Gumilar, I., Wangsaatmaja, S., Fukuda, Y., & Deguchi, T. (2009). Land subsidence and groundwater extraction in Bandung Basin, Indonesia. *IAHS-AISH Publication*. 145-156.
- Ablanedo-Rosas, J. H., Gao, H., Zheng, X., Alidaee, B., & Wang, H. (2010). A study of the relative efficiency of Chinese ports: A financial ratio-based data envelopment

- analysis approach. *Expert Systems*, 27(5), 349-362. <https://doi.org/10.1111/j.1468-0394.2010.00552.x>
- Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*, 6(5), 438-445. <https://doi.org/10.1108/15265940510633505>
- Abor, J. Y. (2007). Corporate governance and financing decisions of Ghanaian listed firms. *Corporate Governance International Journal of Business in Society*, 7(1), 83-92. <https://doi.org/10.1108/14720700710727131>
- Achchuthan, R., Kajanathan, R., & Sivathasan, N. (2013). Corporate governance practices and capital structure: A case in Sri Lanka. *International Journal of Business and Management*, 21(8), 114 -125. <http://dx.doi.org/10.5539/ijbm.v8n21p114>
- Afza, T., & Nazir, M. (2009). Impact of aggressive asset management policy on firms' profitability. *The IUP Journal of Applied Finance*, 15(8), 20-30.
- Agyei, A., & Owusu, A. R. (2014). The effect of ownership structure and corporate governance on capital structure of Ghanaian listed manufacturing companies. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 4(1), 109-118. <https://doi.org/10.6007/ijarafms/v4-i1/547>
- Ahmad, M. I., Guohui, W., Hasan, M., Rafiq, M. Y., & Rehman, R. (2017). Financial leverage hits corporate performance. *Advances in Applied Economic Research*, 6(1), 125-138. https://doi.org/10.1007/978-3-319-48454-9_10
- Ahmed Sheikh, N., & Wang, Z. (2013). The impact of capital structure on performance. *International Journal of Commerce and Management*, 23(4), 354-368. <https://doi.org/10.1108/ijcoma-11-2011-0034>

- Ailawadi, K. L., Lehmann, D. R., & Neslin, S. A. (2003). Revenue premium as an outcome measure of brand equity. *Journal of Marketing*, 67(4), 1-17. <https://doi.org/10.1509/jmkg.67.4.1.18688>
- Akinlo, O., & Asaolu, T. (2012). Profitability and leverage: Evidence from Nigerian firms. *Global Journal of Business Research*, 6(1), 17-25.
- Akintoye, R. (2008). Effect of capital structure on firms' performance: The Nigerian experience. *European Journal of Economics, Finance and Administrative Sciences*, 10, 233- 243.
- Al-Ani, M. K. (2013). Effects of assets structure on the financial performance: Evidence from Sultanate of Oman. In *Proceedings of the 11th Eurasia Business and Economics Society Conference*. Ekaterinburg, Russia, 147–165.
- Alarussi, A. S., & Alhaderi, S. M. (2018). Factors affecting profitability in Malaysia. *Journal of Economic Studies*, 45(3), 442-458. <https://doi.org/10.1108/jes-05-2017-0124>
- Alghusin, N. (2015). The impact of financial leverage, growth, and size on profitability of Jordanian industrial listed companies. *Research Journal of Finance and Accounting*, 6(16), 86-93.
- Aliabadi, S., Dorestani, A., & Balsara, N. (2013). The most value relevant accounting performance measure by industry. *Journal of Accounting and Finance*, 13(1987), 22–34.
- Al-Jafari, M. K., & Al-Samman, H. (2015). Determinants of profitability: Evidence from industrial companies listed on Muscat securities market. *Review of European Studies*, 7(11), 303-311. <https://doi.org/10.5539/res.v7n11p303>

- Al-Matari, E. M., Al-Swidi, A. K., & Fadzil, F. H. (2014). The measurements of firm performance's dimensions. *Asian Journal of Finance & Accounting*, 6(1), 24-49. <https://doi.org/10.5296/ajfa.v6i1.4761>
- Almeida, H., & Campello, M. (2007). Financial constraints, asset tangibility, and corporate investment. *Review of Financial Studies*, 20(5), 1429-1460. <https://doi.org/10.1093/rfs/hhm019>
- Al-Najjar, B., & Hussainey, K. (2011). Revisiting the capital-structure puzzle: UK evidence. *Journal of Risk Finance*, 12(4), 329-338.
- Al-Saidi, M., & Al-Shammari, B. (2013). Board composition and bank performance in Kuwait: An empirical study. *Managerial Auditing Journal*, 28(6), 472-479. <https://doi.org/10.1108/02686901311329883>
- Ameh, O. J., Soyingbe, A. A., & Odusami, K. T. (2010). Significant factors causing cost overruns in telecommunication projects in Nigeria. *Journal of Construction in Developing Countries*, 15(2), 49-67.
- Amir, E., Lev, B., & Sougiannis, T. (2003). Do financial analysts get intangibles? *European Accounting Review*, 12(4), 635-659. <https://doi.org/10.1080/0963818032000141879>
- Andonova, V., & Ruíz-Pava, G. (2016). The role of industry factors and intangible assets in company performance in Colombia. *Journal of Business Research*, 69(10), 4377-4384. <https://doi.org/10.1016/j.jbusres.2016.03.060>
- Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *The Journal of Finance*, 55, 81–106.
- Appelbaum, E. (2017). Domestic outsourcing, rent seeking, and increasing inequality. *Review of Radical Political Economics*, 49(4), 513-528. <https://doi.org/10.1177/0486613417697121>

- Aquino, R. (2010). *Discussion paper 1005 Capital structure of Philippine listed and unlisted firms: 1997-2008*. University of the Philippines, College of Business Administration.
- Aquizzi, A., & Paynee, C. (2007). Asset performance management drives mining profitability: Increasing coal production without significant capital investment: Retrieved from [http://www.ivara.com/content/pdfs Mining-Innovation – USCCG](http://www.ivara.com/content/pdfs/Mining-Innovation-USCCG).
- Ariff, M., Taufiq, H., & Shamsher, M. (2008). How capital structure adjusts dynamically during financial crises. *Corporate Finance Review*, 13(3), 11-24.
- Ariffin, N. (2000). *How capital structure adjusts dynamically during financial crises* [Unpublished doctoral dissertation]. University of Sussex, Sussex.
- Ashmarina, S. I., & Zotova, A. S. (2015). The reasoning for methodical instruments of evaluation of organization readiness, possibility and necessity to implement the organizational changes. *Mediterranean Journal of Social Sciences*, 6(3), 44-48. <https://doi.org/10.5901/mjss.2015.v6n3p44>
- Azad, A.M., Raza A., & Zaidi, S.S. (2018). Empirical relationship between operational efficiency and profitability (evidence from Pakistan exploration sector). *Journal of Accounting, Business and Finance Research*, 2(1), 7-11.
- Azadi, M. (2013). The relationship between changes in asset structure and operating earnings in the Tehran Stock Exchange (TSE). *Trends in Advanced Science and Engineering*, 7(1), 30-34.
- Babalola, Y. Y. (2013). The effect of firm size on firms profitability in Nigeria. *Journal of Economics and Sustainable Development*, 14(5), 90-95.
- Baietti, A. (2001). *Private infrastructure in East Asia lessons learned in the aftermath of the crisis*. The World Bank.

- Baker, H. K., & Martin, G. S. (2011). *Capital structure and corporate financing decisions: theory, evidence, and practice* (vol. 15). John Wiley & Sons.
- Balakrishnan, C. (2016). On the determinants of firm value of Indian companies. *SSRN Electronic Journal*, 3(7), 137-145. <https://doi.org/10.2139/ssrn.2874086>
- Balatbat, M. C., Lin, C., & Carmichael, D. G. (2010). Comparative performance of publicly listed construction companies: Australian evidence. *Construction Management and Economics*, 28(9), 919-932. <https://doi.org/10.1080/01446193.2010.501805>
- Ballow, J. J., Burgman, R., & Molnar, M. J. (2004). Managing for shareholder value: Intangibles, future value and investment decisions. *Journal of Business Strategy*, 25(3), 26-34. <https://doi.org/10.1108/02756660410536973>
- Baltagi, B.H. (2008). *Econometric analysis of panel data*. Chichester: John Wiley & Sons Ltd.
- Bank Negara Malaysia. (2012). Bank Negara Malaysia Central Bank of Malaysia. <https://www.bnm.gov.my/files/publication/ar/en/2012/cp01.pdf>
- Barnes, P. (2000). The identification of U.K. takeover targets using published historical cost accounting data some empirical evidence comparing logit with linear discriminant analysis and raw financial ratios with industry-relative ratios. *International Review of Financial Analysis*, 9(2), 147-162. [https://doi.org/10.1016/s1057-5219\(00\)00022-3](https://doi.org/10.1016/s1057-5219(00)00022-3)
- Batchimeg, B. (2017). Financial performance determinants of organizations: The case of Mongolian companies. *Journal of Competitiveness*, 9(3), 22-33. <https://doi.org/10.7441/joc.2017.03.02>

- Bebeji, A., Mohammed, A., & Tanko, M. (2015). The effect of board size and composition on the financial performance of banks in Nigeria. *African Journal of Business Management*, 9(16), 590-598. <https://doi.org/10.5897/AJBM2015.7797>
- Becker-Blease, J., Kaen, F., Etebari, A., & Baumann, H. (2010). Employees, firm size and profitability in U.S. manufacturing industries. *Investment Management and Financial Innovations*, 7(2), 7-23.
- Belhaj, S., & Mateus, C. (2016). Corporate governance impact on bank performance evidence from Europe. *Corporate Ownership & Control*, 13(4), 583-597. <https://doi.org/10.22495/cocv13i4c4p8>
- Bhayani, S. J. (2010). Determinant of profitability in Indian cement industry: An economic analysis. *South Asian Journal of Management*, 17(4), 6-20.
- BIPC/CIDB. (2003). *Establishing Priorities to Improve the Malaysian Construction Industry for Future*, CIDB, Kuala Lumpur.
- Blair, M. M. (1995). Rethinking assumptions behind corporate governance. *Challenge*, 38(6), 12-17. <https://doi.org/10.1080/05775132.1995.11471861>
- Bloom, M. (2008). *Double accounting for goodwill: A problem redefined*. Routledge.
- Bokhari, H. W., & Khan, M. A. (2013). The impact of capital structure's on firm's performance (A case of non-financial sector of Pakistan). *European Journal of Business and Management*, 5(31), 111-137.
- Bontempi, M. E., & Mairesse, J. (2014). Intangible capital and productivity at the firm level: A panel data assessment. *Economics of Innovation and New Technology*, 24(1-2), 22-51. <https://doi.org/10.1080/10438599.2014.897859>

- Boussaada, R., & Karmani, M. (2015). Did board of directors have an impact on MENA bank performance? *International Journal of Economics and Finance*, 7(4), 46-56.
<https://doi.org/10.5539/ijef.v7n4p46>
- Breusch, T., & Pagan, A. (1979). A simple test of heteroscedasticity and random coefficient variation. *Econometrica*, 47, 1287–1294.
- Brigham, E. F. (1995). *Fundamentals of financial management* (7th ed.). Dryden Press.
- Campello, M., & Giambona, E. (2010). *Asset tangibility and capital structure*. Working paper, University of Illinois.
- Cannon, J., & Hillebrandt, P. M. (1989). Theories of the firm. *The Management of Construction Firms*, 1-8. https://doi.org/10.1007/978-1-349-13626-1_1
- Carson, E., Ranzijn, R., Winefield, A., & Marsden, H. (2004). Intellectual capital: Mapping employee and work group attributes. *Journal of Intellectual Capital*, 5(3), 443-463.
<https://doi.org/10.1108/14691930410550390>
- Chen, C. R., & Steiner, T. L. (1999). Managerial ownership and agency conflicts: A nonlinear simultaneous equation analysis of managerial ownership, risk taking, debt policy, and dividend policy. *The Financial Review*, 34(1), 119-136.
<https://doi.org/10.1111/j.1540-6288.1999.tb00448.x>
- Chen, H., C'urdia, V., & Ferrero, A. (2011). The macroeconomic effects of large-scale asset purchase program. *Federal Reserve Bank of New York Staff Reports*, 527.
- Chen, M., Cheng, S., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, 6(2), 159-176.
<https://doi.org/10.1108/14691930510592771>

- Chiang, Y. H., Chan, P. C., & Albert, H. C. E. (2002). Capital structure and profitability of the property and construction sectors in Hong Kong. *Journal of Property Investment & Finance*, 20(6), 434-453. <https://doi.org/10.1108/14635780210446469>
- Chinaemerem, O. C., & Anthony, O. (2012). Impact of capital structure on the financial performance of Nigerian firms. *Oman Chapter of Arabian Journal of Business and Management Review*, 1(12), 43-61. <https://doi.org/10.12816/0002231>
- Chitiavi, M. S., Musiega, M. G., Alala, O. B., Musiega, D., & Maokomba, C. O. (2013). Capital structure and corporate governance practices. Evidence from listed non-financial firms on Nairobi securities exchange Kenya. *Journal of Business and Management*, 10(2), 8-16. <https://doi.org/10.9790/487X-1020816>
- Chowdhury, A., & Paul Chowdhury, S. (2010). Impact of capital structure on firm's value: Evidence from Bangladesh. *Business and Economic Horizons*, 3, 111-122. <https://doi.org/10.15208/beh.2010.32>
- CIDB. (2004). *Master Plan for Occupational Safety and Health in the Construction Industry 2005-2010*. Construction Industry Development Board (CIDB).
- CIDB. (2017, October). *Country Report Malaysia* [Conference session]. 22nd AsiaConstruct Conference, Seoul, South Korea.
- CIDB. (2017). *Annual Report 2017*. CIDB Malaysia. <https://www.cidb.gov.my/sites/default/files/2020-03/CIDB-Annual-Report-2017-final.pdf>
- Dada, A. O., & Ghazali, Z. B. (2016). The impact of capital structure on firm performance: Empirical evidence from Nigeria. *IOSR Journal of Economics and Finance*, 7(4), 23-30. <https://doi.org/10.9790/5933-0704032330>

- Dao, T. T., & Hoang, T. H. (2012). Corporate governance and performance in Vietnamese commercial banks. *Journal of Economics and Development*, 14(2), 72-95. <https://doi.org/10.33301/2012.14.02.04>
- Darminto & Manurang, A. H. (2008). Pengujian teori trade off dan pecking order dengan satu model dinamis pada perusahaan publik di Indonesia. *Integritas-Jurnal Manajemen Bisnis*, 1(1), 35-52.
- Daud, W., Norwani, M., Mansor, A., & Endut, A. (2016). Does financing decision influence corporate performance in Malaysia? *International Journal of Economics and Financial Issues*, 6(3), 1165-1171.
- Daum, J. H. (2003). *Intangibles assets and value creation*. John Wiley & Sons.
- David, D.F., & Olorunfemi, S. (2010). Capital structure and corporate performance in Nigeria petroleum industry: Panel data analysis. *Journal of Mathematics and Statistics*, 6(2), 168-173. <https://doi.org/10.3844/jmssp.2010.168.173>
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management Review*, 22(1), 20-47. <https://doi.org/10.2307/259223>
- Dawar, V. (2014). Agency theory, capital structure and firm performance: Some Indian evidence. *Managerial Finance*, 40(12), 1190-1206.
- Deakin, E. B. (1976). Distributions of financial accounting ratios: Some empirical evidence. The accounting review. *American Accounting Association*, 51(1), 90-96.
- Delcours, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics & Finance*, 16(3), 400-415. <https://doi.org/10.1016/j.iref.2005.03.005>

- der Mehden, V., Fred, R., & Troner, A. (2007). *Petronas: A national oil company with an international vision*. James A. Baker III Institute for Public Policy, Rice University.
- Dhillon, A.S., & Vachhrajani, H. (2012). Impact of operational efficiency on overall profitability: A case study of GIPCL. *Amrita School of Business Working Paper*, 136/2012.
- Do, T. K., Lai, T. N., & Tran, T. T. (2020). Foreign ownership and capital structure dynamics. *Finance Research Letters*, 36, 101337. <https://doi.org/10.1016/j.frl.2019.101337>
- Do, T. V., Nguyen, T., H., Phan, T. D., & Dang, T. H. (2020). Identifying factors influencing on financial risk of construction firms: Evidence from Vietnam stock market. *Management Science Letters*, 2411-2418. <https://doi.org/10.5267/j.msl.2020.4.010>
- Dogan, M. (2013). Does firm size affect the firm profitability: Evidence from Turkey. *Journal of Finance and Accounting*, 4(4), 53-59.
- Dreachslin, J. L., Weech-Maldonado, R., Jordan, L. R., Gail, J., Epané, J. P., & Wainio, J. A. (2017). Blueprint for sustainable change in diversity management and cultural competence: Lessons from the National Centre for Healthcare Leadership diversity demonstration project. *Journal of Healthcare Management*, 62(3), 171–183. <https://doi.org/10.1097/JHM-D-15-00029>
- Duchin, R., Ozbas, O., & Sensoy, B. A. (2010). Costly external finance, corporate investment, and the subprime mortgage credit crisis. *Journal of Financial Economics*, 97(3), 418-435. <https://doi.org/10.1016/j.jfineco.2009.12.008>
- Ebaid, I. E. (2009). The impact of capital-structure choice on firm performance: Empirical evidence from Egypt. *The Journal of Risk Finance*, 10(5), 477-487. <https://doi.org/10.1108/15265940911001385>

- Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: The proven way to establish your company's real value by measuring its hidden values*. Piatkus.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532-550. <https://doi.org/10.5465/amr.1989.4308385>
- Endut, L. R., Akintoye, A., & Kelly, J. (2009). Cost and time overruns of projects in Malaysia. <http://www.irbnet.deldatenliconddCLB10633.pdf>
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies*, 15(1), 1-33. <https://doi.org/10.1093/rfs/15.1.1>
- Fama, E., & Jensen, M. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301-325. <https://doi.org/10.1086/467037>
- Fanta, A. B. (2013). Corporate governance and impact on bank performance. *Journal of Finance and Accounting*, 1(1), 6-30. <https://doi.org/10.11648/j.jfa.20130101.12>
- Farooq, U., & Nazir, M. S. (2012). An analysis of operating and financial distress in Pakistani firms. *Elixir Finance*, 44, 7133-7137.
- Fellows, R. F., & Liu, A. M. (2008). *Research methods for constructions*. John Wiley & Sons.
- Field, A. (2009). *Discovering Statistics Using SPSS*. SAGE Publications.
- Firer, S., & Williams, M. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital*, 4(3), 348-360. <https://doi.org/10.1108/14691930310487806>
- Flanagan, B. (2005). Managing working capital. *Business Credit*, 107(8), 26-29.

- Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(2), 217-248. [https://doi.org/10.1016/s0304-405x\(02\)00252-0](https://doi.org/10.1016/s0304-405x(02)00252-0)
- Fraser, L., & Aileen, O. (2008). *Memahami laporan keuangan* (7th ed.). PT Indeks.
- Fraser, L., & Ormiston, A. (2004). *Understanding Financial Statements*. Pearson Prentice Hall.
- Frederick, W. C. (2008). *The Oxford handbook of corporate social responsibility*. A. Crane, A. Williams, D. Matten, J. Moon, & D. S. Siegel (Eds.). Oxford University Press.
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- Freeman, R. E. (2004). The stakeholder approach revisited. *Zeitschrift für Wirtschafts- und Unternehmensethik*, 5(3), 228-241. <https://doi.org/10.5771/1439-880x-2004-3-228>
- Frimpong, Y., Oluwoye, J., & Crawford, L. (2003). Causes of delay and cost overruns in construction of groundwater projects in a developing countries: Ghana as a case study. *International Journal of Project Management*, 21(5), 321-326. [https://doi.org/10.1016/s0263-7863\(02\)00055-8](https://doi.org/10.1016/s0263-7863(02)00055-8)
- Gajfullina, M. M., Nizamova, G. Z., Musina, D. R., & Alexandrova, O. A. (2017). Formation of strategy of effective management of fixed production assets of oil companies. *Proceedings of the International Conference on Trends of Technologies and Innovations in Economic and Social Studies 2017*, 38. <https://doi.org/10.2991/ttiess-17.2017.32>
- Ghafoorifard, M., Sheykh, B., Shakibae, M., & Joshaghan, S. (2014). Assessing the relationship between firm size, age and financial performance in listed companies on Tehran stock exchange. *International Journal of Scientific Management and Development*, 2(11), 631-635.

- Gill, A., Biger, N., & Mathur, N. (2011). The effect of capital structure on profitability: evidence from the United States. *International Journal of Management*, 28(4), 3-15.
- Gleason, K. C., Mathur, L. K., & Mathur, I. (2000). The interrelationship between culture, capital structure, and performance: Evidence from European retailers. *Journal of Business Research*, 50(2), 185-191. [https://doi.org/10.1016/S0148-2963\(99\)00031-4](https://doi.org/10.1016/S0148-2963(99)00031-4)
- Green, C., & Heywood, J. S. (2008). Does performance pay increase job satisfaction? *Economica*, 75(300), 710-728.
- Groak, S. (1992). *Idea of building: Thought and action in the design and production of buildings*. E & FN Spon.
- Grover, V., & Kohli, R. (2013). Revealing your hand: Caveats in implementing digital business strategy. *MIS Quarterly*, 37(2), 655-662.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics* (5th ed.). McGraw Hill Inc.
- Gupta, M. C. (1969). The effect of size, growth, and industry on the financial structure of manufacturing companies. *The Journal of Finance*, 24(3), 517-529. <https://doi.org/10.1111/j.1540-6261.1969.tb00370.x>
- Hafez, H. (2017). Corporate governance practices and firms' capital structure decisions: An empirical evidence of emerging economy. *Accounting and Finance Research*, 6(4), 115-129. <https://doi.org/10.5430/afr.v6n4p115>
- Hagel III, J., Brown, J. S., & Davidson, L. (2010, March 4). *The best way to measure company performance*. Harvard Business Review. <https://hbr.org/2010/03/the-best-way-to-measure-company-performance.html>
- Hagel III, J., Brown, J. S., Samoylova, T., & Lui, M. (2013). *Report 3 of the 2013 Shift Index series*. Deloitte University Press.

- Hall, R. (1992). The strategic analysis of intangible resources. *Strategic Management Journal*, 13(2), 135-144.
- Hameed, M. A., Rahman, I. A., & Abd. Karim, A. T. (2013). Significant factors causing cost overruns in large construction projects in Malaysia. *Journal of Applied Sciences*, 13(2), 286-293. <https://doi.org/10.3923/jas.2013.286.293>
- Hammes, K., & Chen, Y. (2004). *Performance of the Swedish real estate sector 1998-2002*. *SSRN Electronic Journal*, 3(12), 211-224. <http://ssrn.com/abstract=495442>.
- Hamzah, H. (2003). Future Prospects for Project Management in the Malaysian Construction Industry, Universiti Malaya.
- Haniffa, R., & Hudaib, M. (2006). Corporate governance structure and performance of Malaysian listed companies. *Journal of Business Finance & Accounting*, 33(2), 1034-1062.
- Hariato, S. (2017). Rasio keuangan dan pengaruhnya terhadap profitabilitas pada bank pembiayaan rakyat syariah. *Esensi*, 7(1), 41-48. <https://doi.org/10.15408/ess.v7i1.4076>
- Hashim, S., & Hassan, H. H. (2017). The impact of capital structure on financial performance of Malaysian public listed construction firms. *International Journal of Advanced Research and Publications*, 1(3), 195-206.
- Hutchinson, R. W. (1995). The capital structure and investment decisions of the small owner-managed firm: Some exploratory issues. *Small Business Economics*, 7(3), 231-239. <https://doi.org/10.1007/bf01135368>
- Ibrahim, H., & Samad, F. A. (2011). Corporate governance mechanisms and performance of public-listed family-ownership in Malaysia. *International Journal of Economics and Finance*, 3(1), 105-115. <https://doi.org/10.5539/ijef.v3n1p105>

- Imtiaz, G., & Ibrahim, A.R. (2005). *Lean production system in project delivery: the way forward for Malaysian construction industry*. Proceedings of Kuala Lumpur Quantity Surveyor Convention.
- Iqbal, A., & Mati, M. (2012). *Relationship between non-current assets & firms profitability*. G. University Library of Munich, Trans.
- Irman, M., Purwati, A. A., & Juliyanti. (2020). Analysis on the influence of current ratio, debt to equity ratio and total asset turnover toward return on assets on the otomotive and component company that has been registered in Indonesia stock exchange within 2011-2017. *International Journal of Economics Development Research*, 1(1), 36-44.
- Isik, O., & Ince, A. R. (2016). Board size, board composition and performance: An investigation on Turkish banks. *International Business Research*, 9(2), 74.
<https://doi.org/10.5539/ibr.v9n2p74>
- Jadah, H. M., Murugiah, L. A/P., & Adzis, A. B. (2016). The effect of board characteristics on Iraqi banks performance. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(4), 205-214.
http://hrmars.com/hrmars_papers/Article_20_The_Effect_of_Board_Characteristics.pdf
- Jamali, D. (2008). A stakeholder approach to corporate social responsibility: A fresh perspective into theory and practice. *Journal of Business Ethics*, 82(1), 213-231.
<https://doi.org/10.1007/s10551-007-9572-4>
- Jamali, A. H., & Asadisadi, A. (2012). Management efficiency and profitability in Indian automobile industry. *Indian Journal of Science and Technology*, 5(5), 233-242.

- Jaradat, M.S. (2015). Corporate governance practices and capital structure: A study with special reference to board size, board gender, outside director, and CEO duality. *International Journal of Economics, Commerce and Management*, 3, 264-273.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behaviour, agency costs, and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
[https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jindal, D., Simran, J., & Vartika (2017). Effect of receivables management on profitability: A study of commercial vehicle industry in India. *International Journal of Applied Sciences and Management*, 2(2), 246-255.
- John, A. O., & Adebayo, O. (2013). Effect of firm size on profitability: Evidence from Nigerian manufacturing sector. *Prime Journal of Business Administration and Management*, 3(9), 1171-1175.
- Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*, 50(3), 649-655. <https://doi.org/10.2307/1912606>
- Jumahana, R. (2017). Pengaruh rasio likuiditas dan rasio aktivitas terhadap profitabilitas pada koperasi karyawan PT. Surya Toto Indonesia. *Jurnal Sekuritas*, 1(2), 54-73.
- Kajananthan, R. (2012). Effect of corporate governance on capital structure, Case of the Sri Lankan listed manufacturing companies. *Journal of Science Arts and Commerce* 3(4), 63-71.
- Kale, S., & Arditi, D. (2001). General contractors' relationships with subcontractors: A strategic asset. *Construction Management and Economics Journal*, 19(5), 541-549.
<https://doi.org/10.1080/01446193.2001.9709630>

- Kamal, E. M., Haron, S. H., Ulang, N. M., & Bahar, F. (2012). The critical review on the Malaysian construction industry. *Journal of Economics and Sustainable Development*, 3(13), 81-87.
- Kane, E. J., & Unal, H. (1990). Modelling structural and temporal variation in the market's valuation of banking firms. *The Journal of Finance*, 45(1), 113-136. <https://doi.org/10.1111/j.1540-6261.1990.tb05083.x>
- Kangarlouei, S. J., Motavassel, M., Azizi, A., & Farahani, M. S. (2012). The investigation of the relationship between dividend policies, cash-flow uncertainty, contributed capital mix and investment opportunities the case of emerging markets (Tehran Stock Exchange). *International Journal of Business and Social Science*, 3(2), 172-181.
- Kantudu, A. S. (2008). Impact of Nigerian accounting standard board act 2003 on compliance with accounting standards on employee retirement benefits in Nigeria. *SSRN Electronic Journal*, 1(3), 18-36. <https://doi.org/10.2139/ssrn.1106429>
- Karim, N. A., Rahman, I. A., Memmon, A. H., Jamil, N., & Azis, A. A. (2012). *Significant risk factors in construction projects: Contractor's perception*. IEEE Colloquium on Humanities, Science and Engineering. <https://doi.org/10.1109/chuser.2012.6504337>
- Kebewar, M. (2013). Does debt affect profitability? An empirical study of French trade sector. *SSRN Electronic Journal*, 4(6), 51-60. <https://doi.org/10.2139/ssrn.2205794>
- Kehinde, J., & Mosaku, T. (2006). An empirical study of assets structure of building construction contractors in Nigeria. *Engineering, Construction and Architectural Management*, 13(6), 634-644. <https://doi.org/10.1108/09699980610712418>
- Keller, K. L., & Lehmann, D. R. (2006). Brands and branding: Research findings and future priorities. *Marketing Science*, 25(6), 740-759.

- Kenley, R. (1999). Cash farming in building and construction: A stochastic analysis. *Construction Management and Economics*, 17(3), 393-401. <https://doi.org/10.1080/014461999371592>
- Khan, A. G. (2012). The relationship of capital structure decisions with firm performance: A study of the engineering sector of Pakistan. *International Journal of Accounting and Financial Reporting*, 2(1), 245-262. <https://doi.org/10.5296/ijafr.v2i1.1825>
- Kiel, G. C., & Nicholson, G. J. (2003). Board composition and corporate performance: How the Australian experience informs contrasting theories of corporate governance. *Corporate Governance*, 11(3), 189-205. <https://doi.org/10.1111/1467-8683.00318>
- Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology*, 72(6), 558-569. <https://doi.org/10.4097/kja.19087>
- Klapper, L. F., & Love, I. (2002). Corporate governance, investor protection and performance in emerging markets. *SSRN Electronic Journal*, 10(5), 703-728. [https://doi.org/10.1016/S0929-1199\(03\)00046-4](https://doi.org/10.1016/S0929-1199(03)00046-4)
- Knaub, J.R. (1996). Weighted multiple regression estimation for survey model sampling. *InterStat*. <http://interstat.statjournals.net/>
- Korajczyk, R. A., & Levy, A. (2003). Capital structure choice: Macroeconomic conditions and financial constraints. *Journal of Financial Economics*, 68(1), 75-109. [https://doi.org/10.1016/s0304-405x\(02\)00249-0](https://doi.org/10.1016/s0304-405x(02)00249-0)
- Kothari, S. P., Laguerre, T., & Leone, A. (2002). Capitalization versus expensing: Evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays. *Review of Accounting Studies*, 7(4), 355-82.

- Kotsina, S., & Hazak, A. (2012). Does investment intensity impact company profitability? A cross-country empirical study. *International Proceedings of Economics Development & Research*, 36, 157-161.
- Krasnikov, A., Mishra, S., & Orozco, D. (2009). Evaluating the financial impact of branding using trademarks: A framework and empirical evidence. *Journal of Marketing*, 73, 154–66.
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911-922. <https://doi.org/10.1111/j.1540-6261.1973.tb01415.x>
- Kruger, M. E. (2004). *Creativity in the entrepreneurship domain* [Unpublished doctoral dissertation]. University of Pretoria, Pretoria.
- Kumar, N. (2016). Firm size and profitability in Indian automobile industry: An analysis. *Pacific Business Review International*, 8, 69–78.
- Langford, D., Iyagba, R., & Komba, D. M. (1993). Prediction of solvency in construction companies. *Construction Management and Economics*, 11(5), 317-325. <https://doi.org/10.1080/014461993000000036>
- Lantz, J. S., & Sahut, J. M. (2005). R&D investment and the financial performance of technological firms. *International Journal of Business*, 10(3), 252-270.
- Lazonick, W., & O'Sullivan, M. (2000). Maximizing shareholder value: A new ideology for corporate governance. *Economy and Society*, 29(1), 13-35.
- Leadbetter, C. (1999). *New measures for the new economy* [Paper presentation]. International Symposium Measuring Reporting Intellectual Capital: Experiences, Issues and Prospects, OECD, Amsterdam.

- Lebas, M. J. (1995). Performance measurement and performance management. *International Journal of Production Economics*, 41(1-3), 23-35.
- Lee, J. (2009). Does size matter in firm performance? Evidence from US public firms. *International Journal of the Economics of Business*, 16(2), 189-203.
- Lerner, J. (2004). *Bookkeeping and accounting*. McGraw-Hill.
- Lev, B. (2001). *Intangibles: Management, measurement and reporting*. Brookings Institution.
- Lev, B., & Daum, J. (2004). The dominance of intangible assets: Consequences for enterprise management and corporate reporting. *Measuring Business Excellence*, 8(1), 6-17.
- Lev, B., & Sougiannis, T. (1998). The capitalization, amortization, and value-relevance of R&D. *The Economic Impact of Knowledge*, 243-272.
- Li, D. (2004). The implications of capital investments for future profitability and stock returns - An overinvestment perspective. University of California, Berkeley.
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.616.87&rep=rep1&type=pdf>
- Li, S. T., Tsai, M. H., & Lin, C. (2010). Building a taxonomy of a firm's knowledge assets: A perspective of durability and profitability. *Journal of Information Science*, 36(1), 36-56.
- Liang, Q., Xu, P., & Jiraporn, P. (2013). Board characteristics and Chinese bank performance. *SSRN Electronic Journal*, 5(7), 157-176. <https://doi.org/10.2139/ssrn.2251496>

- Lim, S. G., Murnighan, J., & Keith, J. (1994). Phases, deadlines, and the bargaining process. *Organizational Behaviour and Human Decision Processes*, 58(2), 153-171.
<https://doi.org/10.1006/obhd.1994.1032>
- Lin, J., & Granger, C. W. (1994). Forecasting from non-linear models in practice. *Journal of Forecasting*, 13(1), 1-9. <https://doi.org/10.1002/for.3980130102>
- Lzryadnova, O. (2013). *Investments in fixed assets in February 2013*.
<http://www.iep.ru/files/RePEc/gai/recdev/108Izryadnova.pdf>
- Majumdar, S., & Chhibber, P. (1999). Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice*, 98, 287-305.
- Makori, D. M., & Jagongo, A. (2013). Working capital management and firm profitability: Empirical evidence from manufacturing and construction firms listed on Nairobi securities exchange, Kenya. *International Journal of Accounting and Taxation*, 1, 5-13.
- Marrocu, E., Paci, R., & Pontis, M. (2012). Intangible capital and firms' productivity. *Industrial and Corporate Change*, 21, 377-402.
- Masadeh, R. M., Tayeh, M., Al-Jarrah, I. M., & Tarhini, A. (2015). Accounting vs. market-based measures of firm performance related to information technology investments. *International Review of Social Sciences and Humanities*, 9(1), 129-145.
- Masood, O., Aktan, B., Turen, S., Javaria, K., & El Seoud, M. (2017). Which resources matter the most to firm performance? An experimental study on Malaysian listed firms. *Problems and Perspectives in Management*, 15(2), 74-80.
[https://doi.org/10.21511/ppm.15\(2\).2017.07](https://doi.org/10.21511/ppm.15(2).2017.07)

- Mauboussin, M. J. (2012, October). *The true measures of success*. Harvard Business Review. <https://hbr.org/2012/10/the-true-measures-of-success>
- Megna, P., & Klock, M. (1993). The impact of intangible capital on Tobin's q in the semiconductor industry. In *AEA Papers and Proceedings May 1993*, 265-269.
- Mehmet, A., & Mehmet, İ. (2018). Determining the impact of financial characteristics on firm profitability: An empirical analysis on Borsa Istanbul Energy firms. *WSEAS Transactions on Business and Economics*, 15, 547- 559.
- Mehri, M., Umar, M. S., Saeidi, P., Hekmat, R. K., & Naslmosavi, S. (2013). Intellectual capital and firm performance of high intangible intensive industries: Malaysia evidence. *Asian Social Science*, 9(9), 146-155. <https://doi.org/10.5539/ass.v9n9p146>
- Ministry of International Trade and Industry. (1994). *Review of the Industrial Master Plan, 1986-1995*. Kuala Lumpur, December.
- Ministry of International Trade and Industry. (1996). *Second Industrial Master Plan 1996-2005*. Kuala Lumpur, November.
- Ministry of International Trade and Industry. (2018). *Third Industrial Master Plan (IMP 3). 2006-2020*. website: <http://www.miti.gov.my/index.php/pages/view/1690>
- Mishra, C. S., & Gobeli, D. H. (1998). Managerial incentives, internalization, and market valuation of multinational firms. *Journal of International Business Studies*, 29(3), 583-598.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261-296.
- Moeller, K. (2009). Intangible and financial performance: Causes and effects. *Journal of Intellectual Capital*, 10(2), 224-245. <https://doi.org/10.1108/14691930910952632>

- Mohamad, N. E., & Mohd Saad, N. B. (2010). Working capital management: The effect of market valuation and profitability in Malaysia. *International Journal of Business and Management*, 5(11), 140-147. <https://doi.org/10.5539/ijbm.v5n11p140>
- Mohd-Saleh, N., Rahman, C., & Ridhuan, M., (2009). Ownership structure and intellectual capital performance in Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, 5(1), 1-29.
- Morck, R., & Yeung, B. (1992). Internalization: An event study test. *Journal of International Economics*, 33(1-2), 41-56.
- Muir, B. (2005). Challenges facing today's construction manager. *Supplemental Reading for University of Delaware Course on Construction Methods and Management*, Accessed, 7.
- Mule, R. K., & Mukras, M. S. (2015). Financial leverage and performance of listed firms in a frontier market: Panel evidence from Kenya. *European Scientific Journal*, 11(7), 534-550.
- Muritala, T. A. (2012). An empirical analysis of capital structure on firms' performance in Nigeria. *International Journal of Advances in Management and Economics*, 1(5), 116-124.
- Myers, S. (1984). Capital structure puzzle. *The Journal of Finance*, 39(3), 575-592. <https://doi.org/10.1111/j.1540-6261.1984.tb03646.x>
- Myers, S. C. (2001). Capital structure. *Journal of Economic Perspectives*, 15(2), 81-102. <https://doi.org/10.1257/jep.15.2.81>
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221. [https://doi.org/10.1016/0304-405x\(84\)90023-0](https://doi.org/10.1016/0304-405x(84)90023-0)

- Naidu, G., & Lee, C. (1997). The transition to privatization: Malaysia. In A. Mody (Ed.). *Infrastructure strategies in East Asia: The untold story*. World Bank.
- Nakamura, M. (2003). Research alliances and collaborations: Introduction to the special issue. *Managerial and Decision Economics*, 24(2-3), 47-49.
- Narware, P.C. (2010). Working capital management: The effect of market valuation and profitability in Malaysia. *International Journal of Business and Management*, 5(11), 140-147.
- Nguyen, N. (2019). Performance evaluation in strategic alliances: A case of Vietnamese construction industry. *Global Journal of Flexible Systems Management*, 21(1), 85-99. <https://doi.org/10.1007/s40171-019-00230-9>
- Nguyen, V. C. (2020). Human capital, capital structure choice and firm profitability in developing countries: An empirical study in Vietnam. *Accounting*, 6(2), 127-136. <https://doi.org/10.5267/j.ac.2019.11.003>
- Niresh, J. A., & Velnampy, T. (2014). Firm size and profitability: A study of listed manufacturing firms in Sri Lanka. *International Journal of Business and Management*, 9(4), 57-64.
- Nunes, P. J. M., Serrasqueiro, Z. M., & Sequeira, T. N. (2009). Profitability in Portuguese service industries: A panel data approach. *The Service Industries Journal*, 29(5), 693-707.
- Odusanya, I. A., Yinusa, O. G., & Ilo, B. M. (2018). Determinants of firm profitability in Nigeria: Evidence from dynamic panel models. *SPOUDAI Journal of Economics and Business*, 68(1), 43-58.
- Ofori, G. (2000). Challenges of construction industries in developing countries: Lessons from various countries. In *2nd International Conference on Construction in*

Developing Countries: Challenges Facing the Construction Industry in Developing Countries, 1-13.

Okposin, S. B., Abdul Hamid, A. H., & Boon, H. O. (2005). *The changing phase of Malaysian economy*. Pelanduk Publications.

Okwo, M. I., Okelue, U. D., & Uche, N. A. (2012). Investment in fixed assets and firm profitability: Evidence from the Nigerian brewery industry. *European Journal of Business and Management*, 4(20), 10-17.

Olateju, B. (1992). *Managing project finance: The working capital perspective*. In B. Olateju (Ed.), *Proceedings of the National Seminar on Effective Contract Management in the Construction Industry*, 1-23.

Onaolapo, A., & Kajola, O. (2010). Capital structure and firm performance: Evidence from Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 25, 75-82.

Osborn, R. A. (2014). Bankruptcy: Embarrassment, surviving, thriving. Create space independent publishing platform. *International Journal of Information, Business and Management*, 11(2), 15-24.

Owolabi, J. D., Amusan, L. M., Oloke, C. O., Olusanya, O., Tunji-Olayeni, P., Owolabi D., Peter Joy & Ignatious, O. (2014). Causes and effect of delay on project construction delivery time. *International Journal of Education and Research*, 2(4), 197-208.

Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: An analysis of Mauritian small manufacturing firms. *International Review of Business Research Papers*, 2(2), 45-58.

- Pang, E. F., & Chan, H. C. (1987). The political economy of development in Singapore 1959-1986. In E. F. Pang & H. C. Chan (Eds.), *The political economy of development in ASEAN*. Institute of Southeast Asian Studies.
- Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21, 222–237.
- Pathan, S., Skully, M., & Wickramanyake, J. (2008). Reforms in Thai bank governance: an aftermath of the Asian financial crisis. *International Review of Financial Analysis*, 17(2), 345-362. <https://doi.org/10.1016/j.irfa.2006.05.002>
- Pavlik, E. L., Scott, T. W., & Tiessen, P. (1993). Executive compensation: Issues and research. *Journal of Accounting Literature*, 12, 131-189.
- Popa, A., & Ciobanu, R. (2014). The financial factors that influence the profitability of SMEs. *International Journal of Academic Research in Economics and Management Sciences*, 3(4), 177-185. <https://doi.org/10.6007/IJAREMS/v3-i4/1117>
- Pouraghajan, A., & Malekian, E. (2012). The relationship between capital structure and firm performance evaluation measures: Evidence from the Tehran stock exchange. *International Journal of Business and Commerce*, 1(9), 166–181.
- Pratt, R. (2000). *Project management in Malaysia, some ideas on the way ahead* [Paper presentation]. Project Management: Strategies, Techniques, Operations and Control the Meeting of the Asia Pacific Diligence Sdn Bhd, Kuala Lumpur.
- Purag, M. B., Abdullah, A. B., & Bujang, I. (2016). Corporate governance and capital structure of Malaysian family-owned companies. *Journal of Business and Retail Management Research*, 11(11), 18-30.

- Purba, J. H., & Bimantara, D. (2020). *The influence of asset management on financial performance, with panel data analysis*. In *Proceedings of the 2nd International Seminar on Business, Economics, Social Science and Technology*.
<https://doi.org/10.2991/aebmr.k.200522.031>
- Putry, N. A. C., & Erawati, T. (2013). Pengaruh current ratio, total assets turnover, dan net profit margin terhadap return on assets. *Jurnal Akuntansi*, 1(2), 22-34.
- Raggio, R. D., & Leone, R. P. (2007). The theoretical separation of brand equity and brand value: Managerial implications for strategic planning. *Journal of Brand Management* 14(5), 380-395.
- Raheel, T., & Shah, F. M. (2009). A study that identify the relationship between the financial leverage and firms profitability: Empirical evidence from oil and gas companies of Pakistan listed in KSE. *International Journal of Scientific & Engineering Research*, 6(11), 80-88.
- Rahmah, A. M., Cipta, W., & Yudiaatmaja, F. (2016). Pengaruh likuiditas, solvabilitas dan aktivitas terhadap profitabilitas pada perusahaan otomotif yang di bursa efek Indonesia periode 2012-2014. *Jurnal Manajemen*, 4, 1-8.
- Rahman, I. A., Memon, A. H., & Abd. Karim, A. T. (2013). Significant factors causing cost overruns in large construction projects in Malaysia. *Journal of Applied Sciences*, 13(2), 286-293. <https://doi.org/10.3923/jas.2013.286.293>
- Ramamonjiarivelo, Z. (2016). The impact of privatization on efficiency and productivity: The case of US public hospitals. *Journal of Health Care Finance*, 43(2), 105-123.
- Reyhani, A. G. (2012). The investigation of effect of assets structure on performance of accepted companies of Tehran Stock Exchange (TSE). *Journal of Basic and Applied Scientific Research*, 2(2), 1086-1090.

- Riahi-Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms: A study of the resource-based and stakeholder views. *Journal of Intellectual Capital*, 4(2), 215-26.
- Robins, P. (1999). FRS 11, impairment of fixed assets and goodwill. *Professional Scheme Publication of ACCA for Student Accountant*.
- Roca-Puig, V., Beltrán-Martín, I., Bou-Llusar, J. C., & Escrig-Tena, A. B. (2008). External and internal labour flexibility in Spain: A substitute or complementary effect on firm performance? *The International Journal of Human Resource Management*, 19(6), 1131-1151. <https://doi.org/10.1080/09585190802051428>
- Ruan, W., Tian, G., & Ma, S. (2011). Managerial ownership, capital structure and firm value: Evidence from China's civilian-run firms. *Australasian Accounting Business and Finance Journal*, 5(3), 73-92.
- Rusdiyanto, A. D., Soetedjo, S., Narsa, I. M., & Septiarini, D. F. (2020). Determinants of audit delay in Indonesian companies: Empirical evidence. *Espacios*, 41(3), 46-55.
- Saeedi, A., & Mahmoodi I. (2011). Capital structure and firm performance: Evidence from Iranian companies. *International Research Journal of Finance and Economics*, 70, 21-28.
- Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia - Social and Behavioural Sciences*, 65, 156-166. <https://doi.org/10.1016/j.sbspro.2012.11.105>.
- Samiloglu, F., Oztog, A. O., & Kahraman, Y. E. (2017). The determinants of firm financial performance: Evidence from Istanbul Stock Exchange (BIST). *IOSR Journal of Economics and Finance*, 8(6), 62-67.

- Sandner, P. G., & Block, J. (2010). The market value of R&D, patents, and trademarks. *Research Policy*, 40(7), 969-985.
- Scott, W. R. (2003). *Financial Accounting Theory*. (3rd ed.). Prentice Hall.
- Shafana, N. (2016). Board of directors' characteristics impact on capital structure decisions: Evidence from Top 50 turnover non- financial companies listed on the Colombo Stock Exchange. *International Journal of Science Research*, 5(10), 79-86. <https://doi.org/10.21275/ART20161970>.
- Shah, A., & Hijazi, T. (2004). The determinants of capital structure of stock exchange-listed non-financial firms in Pakistan. *Pakistan Development Review*, 43, 605-618.
- Shehu, Z., Endut, I. R., Ekintoye, A., & Holt, G. D. (2014). Cost overrun in the Malaysian construction industry projects: A deeper insight. *International Journal of Project Management*, 32, 1471-1480.
- Sheikh, N.A., & Karim, S. (2015). Effects of internal governance indicators on performance of commercial banks in Pakistan. *Pakistan Journal of Social Sciences*, 35(1), 77–90.
- Shubita, F., & Alsawalhah, M. (2012). The relationship between capital structure and profitability. *International Journal of Business and Social Science*, 3(16), 104-112.
- Simerly, R. L., & Li, M. (2000). Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. *Strategic Management Journal*, 21(1), 31-49. [https://doi.org/10.1002/\(sici\)1097-0266\(200001\)21:1<31:aid-smj76>3.0.co;2-t](https://doi.org/10.1002/(sici)1097-0266(200001)21:1<31:aid-smj76>3.0.co;2-t)
- Simon, C., & M. Sullivan (1993). The measurement and determinants of brand equity: A financial approach. *Marketing Science*, 12, 28-52.

- Siromi, B., & Chandrapala, P. (2017). The effect of corporate governance on firms' capital structure of listed companies in Sri Lanka. *Journal of Competitiveness*, 9(2), 19-33. <https://doi.org/10.7441/joc.2017.02.02>
- Smith, D. J., Chen, J., & Anderson, H. D. (2012). Firm financing choices in a thin, capital constrained market. *SSRN Electronic Journal*, 7(3), 337-348. <https://doi.org/10.2139/ssrn.2115259>
- Smith, V. K. (1980). The evaluation of natural resource adequacy: Elusive quest or frontier of economic analysis? *Land Economics*, 56, 257–298.
- Sullivan, M., & Zhang, A. (2011). Are investment and financing anomalies two sides of the same coin? *Journal of Empirical Finance*, 18(4), 616–633.
- Sunjoko, M. I., & Arilyn, E. J. (2016). Effects of inventory turnover, total asset turnover, fixed asset turnover, current ratio and average collection period on profitability. *Jurnal Bisnis dan Akuntansi*, 18(1), 79-83. <https://doi.org/10.34208/jba.v18i1.40>
- Svendsen, A.C., Abbott, R.M., Boutilier, R.G. & Wheeler, D. (2001). Pathways to competitive advantage, *CA Magazine*, 134(6), 29-39.
- Todaro, M. P., & Smith, S. C. (2009). *Economic development* (10th ed.). Pearson.
- Tomar, S., & Bino, A. (2012). Corporate governance and bank performance: Evidence from Jordanian banking industry. *Jordan Journal of Business Administration*, 8(2), 353-372.
- Tsai, C., Lu, Y., & Yen, D. C. (2012). Determinants of intangible assets value: The data mining approach. *Knowledge-Based Systems*, 31, 67-77.
- Uwuigbe, U., Uwuigbe, O. R., & Daramola, P. S. (2014). Corporate governance and capital structure: Evidence from listed firms in Nigeria Stock Exchange. *Advances in Management*, 7(2), 44-49.

- Vakilifard, H. R., Gerayli, M. S., Yanesari, A. M., & Ma'atoofi, A. R. (2011). Effect of corporate governance on capital structure: Case of the Iranian listed firms. *European Journal of Economics Finance and Administrative Science*, 35, 165-172.
- Vatavu, S. (2015). Determinants of return on assets in Romania: A principal component analysis. *Timisoara Journal of Economics and Business*, 8(1), 32-47. <https://doi.org/10.1515/tjeb-2015-0003>
- Victor, D., & Badu, J. (2012). Capital structure and performance of listed banks in Ghana. *Global Journal of Human Social Science*, 12(5), 56-62.
- Vijayakumar, R. A., & Tamizhselvam, T. (2010). Corporate size and profitability: An empirical analysis. *Journal for Bloomers Research*, 3(1), 44-53.
- Vinasithamby, S. (2015). Does firm size influence on firm's profitability? Evidence from listed firms of Sri Lankan hotels and travels sector. *Research Journal of Finance and Accounting*, 6(6), 201-207.
- Vithessonthi, C., & Tongurai, J. (2015). The effect of firm size on the leverage–performance relationship during the financial crisis of 2007–2009. *Journal of Multinational Financial Management*, 29, 1-29. <https://doi.org/10.1016/j.mulfin.2014.11.001>
- Vu, L. T. T., & Nguyen, T. H. (2019). The impact of capital structure on the performance of construction companies: A study from Vietnam stock exchanges. *Growing Science, Canada Accounting*, 6, 169-176. <https://doi.org/10.5267/j.ac.2019.10.006>
- Waggoner, D. B., Neely, A. D., & Kennerley, M. (1999). The forces that shape organisational performance measurement systems. *International Journal of Production Economics*, 60-61, 53-60. [https://doi.org/10.1016/s0925-5273\(98\)00201-1](https://doi.org/10.1016/s0925-5273(98)00201-1)

- Warrad, L., & Rania, A. O. (2015). The impact of turnover ratios on Jordanian services sectors' performance. *Journal of Modern Accounting and Auditing*, 11(2), 77-85. <https://doi.org/10.17265/1548-6583/2015.02.001>
- Wellalage, N., & Locke (2012). Corporate governance and capital structure decisions of Sri Lankan listed firms. *Global Review of Business and Economic Research*, 8(1), 157-169.
- Westfall, P. H. (2014). Kurtosis as peakedness, 1905–2014. *R.I.P., The American Statistician*, 68(3), 191-195. <https://doi.org/10.1080/00031305.2014.917055>
- Weston, J.F., & Copeland, T.E. (1989). *Managerial Finance* (8th ed.). The Dryden Press.
- Wong, B. T. H. (1991). *Development of the Malaysian construction industry: Its concepts, approach and strategy*. In *ASEAN International Symposium on Construction and Development*.
- Worren, N., Moore, K., & Cardona, P. (2002). Modularity, strategic flexibility, and firm performance: A study of the home appliance industry. *Strategic Management Journal*, 23(12), 1123-1140. <https://doi.org/10.1002/smj.276>
- Wu, W. T. A. (2014). The P/E ratio and profitability. *Journal of Business & Economics Research (Online)*, 12(1), 67-76.
- You, T., & Zi, H. (2007). The economic crisis and efficiency change: Evidence from the Korean construction industry. *Applied Economics*, 39(14), 1833-1842. <https://doi.org/10.1080/00036840600690199>
- Yuris, N. H., Kurnia, F. M., & Yuniarsih, T. (2020). Effect of the return of investment towards fixed assets investment at Rapih Metalindo Corporation. In R. Hurriyati, B. Tjahjono, I. Yamamoto, A. Rahayu, A. G. Abdullah, & A. A. Danuwijaya (Eds.),

- Advances in Business, Management and Entrepreneurship* (1st ed.). Taylor & Francis Group.
- Zabri, S. M., Ahmad, K., & Khaw, K. W. (2016). Corporate governance practices and firm performance: Evidence from top 100 public listed companies in Malaysia. *Procedia Economics and Finance*, 35, 287-296.
- Zahra, S. A., Hayton, J. C., Neubaum, D. O., Dibrell, C., & Craig, J. (2008). Culture of family commitment and strategic flexibility: The moderating effect of stewardship. *Entrepreneurship Theory & Practice*, 32(6), 1035–1054.
- Zaini, B. O. (2000, July). Malaysian construction industry: Challenges and demands [Conference session]. 3rd Annual Convention of Malaysian Structural Steel Association, Kuala Lumpur.
- Zeitun, R. (2009). Ownership structure, corporate performance and failure: Evidence from panel data of emerging market the case of Jordan. *Corporate Ownership and Control*, 6(4), 96-114. <https://doi.org/10.22495/cocv6i4p10>
- Zeitun, R., & Al-Kuwari, D. (2012). Government ownership, business risk, financial leverage and corporate performance: Evidence from GCC countries. *Corporate Ownership and Control*, 9(3), 123-131. <https://doi.org/10.22495/cocv9i3art10>
- Zeitun, R., & Tian, G. G. (2007). Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business and Finance Journal and Authors*, 1(4), 1-36. <https://doi.org/10.2139/ssrn.2496174>
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business Research Methods*. Cengage Learning.

APPENDIX

Appendix A - Sample List of Construction Firms

No.	Company	No.	Company
1.	ARK Resources Berhad	20.	Kimlun Corporation Berhad
2.	Ahmad Zaki Resources Berhad	21.	Lebar Daun Berhad
3.	Bina Darulaman Berhad	22.	Melati Ehsan Holdings Berhad
4.	Bina Puri Holdings Berhad	23.	Merge Energy Berhad
5.	Brem Holding Berhad	24.	Mitrajaya Holdings Berhad
6.	Crest Builder Holdings Berhad	25.	MTD ACPI Engineering Bhd
7.	DKLS Industries Berhad	26.	Mudajaya Group Berhad
8.	Ekovest Berhad	27.	Muhibbah Engineering (M) Bhd
9.	Fajarbaru Builder Group Berhad	28.	PLB Engineering Berhad
10.	Fututech Berhad	29.	Protasco Berhad
11.	Gadang Holdings Berhad	30.	Prinsiptek Corporation Berhad
12.	Gamuda Berhad	31.	Pintaras Jaya Berhad
13.	Ho Hup Berhad	32.	Sycal Ventures Berhad
14.	Hock Seng Lee Berhad	33.	TRC Synergy Berhad
15.	IJM Corporation Berhad	34.	TRIpIc Berhad
16.	Ireka Corporation Berhad	35.	TSR Capital Berhad
17.	Jaks Resources Berhad	36.	WCT Berhad
18.	Kumpulan Jetson Berhad	37.	Zecon Berhad
19.	Kumpulan Europlus Berhad	38.	Zelan Berhad