THE IMPACT OF SELECTIVE FINANCIAL DETERMINANTS ON TOBIN'S Q OF MINING AND EXTRACTION INDUSTRIES COMPANIES LISTED IN AMMAN STOCK EXCHANGE

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ABSTRACT

Tobin's Q Ratio, as a measurement and valuation tool for companies, has been used extensively under different settings. This research study combines two multiple regression models used in a different settings in both Indonesia and Iran to investigate the relationship between the firm's value, represented by Tobin's Q ratio, as a dependent variable and total assets, return on assets, debt ratio and free cash flow as independent variables. The study selects the listed companies under the mining and extraction sector in Amman Stock Exchange. The range of the data collected is between 2005 to 2020 and Microsoft Excel is used to analyze the data through it to obtain the statistical description, Pearson Correlation Coefficient and Multiple Regression results. The study concludes that there is a significant and positive relationship between the firm's value and its return on assets. Moreover, there is a moderate and positive relationship between the firm's value and its free cash flow and total assets, inverse and moderate relationship between firm's value and its debt ratio.

Keywords: Amman Stock Exchange, Debt Ratio, Free Cash Flow (FCF), Return on Assets (ROA), Total Asset, Tobin's Q

INTRODUCTION

Tobin's Q ratio is extensively used as an evaluation and measurement tool for investment opportunities. Thus, if the Tobin's Q ratio is a valid evaluation and measurement tool, this research paper should investigate its relationship with the total assets, return on assets, debt ratio and free cash flow. It is worth noting that Tobin's Q ratio is defined as the firm's market value divided by its assets' replacement cost.

Therefore, the main purpose of this research paper is to investigate the impact of the debt ratio, total assets, free cash flow, and return on assets on the firms' value of the listed mining and extraction companies in Amman Stock Exchange (ASE) based on combining two models where the first model tested three independent variables with Tobin's Q in Tehran Stock Exchange by Mansourlakoraj and Sepasi in 2015 and the second model tested one independent variable with Tobin's Q in the Indonesia Stock Exchange by Al Ghifari, Triharjono & Juhaeni (2013).

Hence, this research paper shall state the research problem from the phenomena in question's angle. It will also explain its importance from four key arguments related to those stakeholders. Consequently, it shall determine its objectives taking into consideration the model to be used and the key stakeholders of this sector.

Moreover, the theoretical framework section shall utilize five theories related to the research paper's objectives as well as relating them to the dependent variable, which is in general the firm's valuation, and to the four independent variables, which are total assets, return on assets, debt ratio

and free cash flow. Thus, those five theories are the Agency Theory, the Capital Structure Theory, the Static Trade-off Theory, the Pecking Order Theory, and the Free Cash Flow Hypothesis.

Furthermore, the literature review section shall review and summarize twelve different, recent and relevant academic articles to explore the relationship, influence, and/or impact of Tobin's Q ratio, as a measurement of a firm's value, on the selected firm's total assets, free cash flow, debt ratio, and/or return on assets.

Likewise, the section of data and methodology describes the nature of the study, determines the sources of data, the time range of the data to be collection which is between 2005 to 2018. In addition, it also determines the population which is the 10 listed companies under the mining and extraction sector in Amman Stock Exchange as well as introduces the research model using the multiple regression analysis.

Research Problem

The phenomena, which this research paper intends to address, is the impact of selective financial determinants that are debt ratio, total assets, return on assets and free cash flow on the business valuation for a selected sector in Amman Stock Exchange. In addition, the research paper shall use Tobin's Q as a valuation measurement ratio. Moreover, the research paper is also addressing a gap in the relevant literature related to the chosen topic and sector in the selected financial market, which are the business valuation using Tobin's Q ratio, the mining and extraction sector, and Amman Stock Exchange respectively. Ultimately, this research paper shall assist the key stakeholders of those listed firms in knowing such a relationship in order to either make an informed investment or financing decision to the selected population.

Research Importance

This academic research is important to the key stakeholders of the Jordanian mining and extraction sector, in general, and to those directly and indirectly related to the listed companies in Amman Stock Exchange in particular. Where the key stakeholders of the research are the regulators of this sector and financial securities, local, national, regional and international lending institutions of this sector, Jordanian, Arab and Non-Arab equity investors, traders and brokers, and academic researchers (Gitman & Zutter, 2012).

Firstly, it is important for the regulators of this sector as the total assets of all companies listed in Amman Stock Exchange grew from JOD 1.080 billion as of 31st December 2005 to JOD 2.538 billion as of 31st December 2018, in other words, the sector grew by more than 135% in 14 years. In the same time, the sector also witnessed listing two companies during this period. The first listing and initial public offering was for The United Iron and Steel Manufacturing Company, which was established in 1992 and listed in 2007. The second listing and initial public offering was for The Northern Cement Company, which was established in 2007 and listed in 2010. Hence, the regulators of this sector shall have a great interest in the continuous growth of this sector and increase the number of listed firms to attract local, national, regional and foreign capital and investments (Amman Stock Exchange, 2020; Gitman & Zutter, 2012; Jordan & Miller, 2009).

Secondly, this academic research shall also be a great of interest to lending institutions as the total liabilities of the sector also grew from JOD 421 million as of 31st December 2005 to JOD 872 million as of 31st December 2014 in the last 14 years, in other words, the sector lending capacity grew by 107%. This can be a positive indicator for the lending institutions as those listed firms proved to be creditworthy (Amman Stock Exchange, 2020; Gitman & Zutter, 2012; Jordan & Miller, 2009).

Thirdly, this academic research can also attract the attention to equity investors as the total equity of this sector grew by more than 151% during the period in question. The total shareholders' equity reached JOD 1.654 billion as of 31st December 2018 in comparison to the total shareholders' equity that was JOD 658 million as of 31st December 2005 (Amman Stock Exchange, 2020; Gitman & Zutter, 2012; Jordan & Miller, 2009).

Lastly, traders and brokers deal with the securities available for trading as well as academic researchers can have an additional view, dimension and insight of the key variables that can affect the valuation of the companies listed in this sector (Amman Stock Exchange, 2020; Gitman & Zutter, 2012; Jordan & Miller, 2009).

In conclusion, this academic research is important to regulators, lending institutions, equity investors, brokers, traders and academics as it shall demonstrate that whether debt ratio, capital structure, total assets, free cash flow and return on assets affect the value of the companies in listed in the mining and extraction sectors in Amman Stock Exchange. Secondly, it also fills in this research gap by empirically investigating this relation. Lastly, the findings will be of interest to Jordanian capital market participants (Amman Stock Exchange, 2020; Mansourlakoraj et al., 2015; Al Ghifari et al., 2013; Gitman & Zutter, 2012; Jordan & Miller, 2009; Fosberg & Ghosh, 2006).

Research Objectives

The research objectives of this paper are in line with the conceptual framework of financial reporting issued by the International Accounting Standards Board (IASB) that stresses on provide useful information to investors, lenders and other creditors (Conceptual Framework for Financial Reporting, 2018). Therefore, it shall focus on four key independent variables and investigative the relationships of those four independent variables with Tobin's Q ratio of the listed companies in the mining and extraction sector in Amman Stock Exchange through using a combined model from two research academic papers from Indonesia and Iran (Mansourlakoraj et al., 2015, Al Ghifari et al., 2013).

Thus, the main objectives of the research paper are firstly to add to the understanding of the variables affecting Tobin's Q of listed mining and extraction companies in Amman Stock Exchange. Secondly, the research paper aims to determine the relationship between corporate value, using Tobin's Q, to the debt ratio, total assets, and free cash flow (Mansourlakoraj et al., 2015). Finally, it also aims to determine the relationship between corporate value, using Tobin's Q, to the return on assets (Al Ghifari et al., 2013).

Therefore, this research paper shall present an in-depth result using the four independent variables, which are the total assets, debt ratio, free cash flow and return on assets, with the dependent variable that is Tobin's Q (Mansourlakoraj et al., 2015; Al Ghifari et al., 2013).

THE THEORETICAL FRAMEWORK

The theoretical framework section shall address firstly the agency theory through summarizing the original article as well as nine academic journals where it highlights the relationship between the agency theory and the capital structure, level of debt, the size of the firm and the valuation Secondly, this section provides an overview of the capital structure theory through summarizing the key two articles as well as nine academic journals. Thirdly, this section also focuses on the key arguments and analysis shown in the static trade off theory and the pecking order theory through the original articles and six academic journals. Finally, the theoretical framework section reviews the free cash flow hypothesis through the summary of its original article and other nine academic journals (Jensen, 1986; Myers & Majluf, 1984; Myers, 1984; Myers, 1977; Jensen & Meckling, 1976; Modigliani & Miller, 1963; Modigliani & Miller, 1958).

The Agency Theory

The agency theory, originally developed and proposed by Jensen & Meckling (1976), assumes that the interests between the principal and agent changes constantly due to several factors, such as the distribution of cash dividends that favors the principals or keeping retained earnings for reinvestment purposes that favors the agents. Thus, this conflicting views can create a gap and rift between the principals who seek to maximize the return on their investments and achieve a higher valuation for their investments and the agents who want to control the resources, in particular financial resources, and achieve a favorable position when it comes to investment decision making (Dakhlallh et al., 2020; Khan et al., 2019; Al-Jamaan, 2018; Ibrahim, 2017; Muchtar et al., 2018; Rahman et al., 2017; Maxwell et al., 2012; Chowdhury et al., 2010; Fosberg et al., 2006; Jensen & Meckling, 1976).

In the same time, the agency theory's advocates argue that the size, the capital structure and level of debt can lower the agency cost and its relevant consequences. Thus, the advocates of such a theory firstly argue that the bigger the size of the firm, the lower the agency cost. Consequently, the gap between the interests of principals and agents shall be narrowed as well as the agents will not begin to act against the principals' interests. In addition, the advocates also argue that the large size firms usually have better governance (Dakhlallh et al., 2020; Khan et al., 2019; Al-Jamaan, 2018; Ibrahim, 2017; Muchtar et al., 2018; Rahman et al., 2017; Maxwell et al., 2012; Chowdhury et al., 2010; Fosberg et al., 2006; Jensen & Meckling, 1976).

The Capital Structure Theory

Similarly, the capital structure of the firm can also be affected by the agency theory as the ownership is separated from the management where the agents can utilize such a separation to their advantage and act against the principals' interests. Therefore, the agency theory assumes the higher level of debt, favoring the use of debt rather than equity, can also lower the cost of agent as the agents will be forced to deal with lenders, mainly banks and other financial intermediaries, to finance the investments sought by them and must be responsible and accountable to their lenders as they need to demonstrate that they are creditworthy as a firm and competent as a manager. As one of the results, the firm's valuation shall be higher as the agents are selecting feasible and profit generating investments (Dakhlallh et al., 2020; Khan et al., 2019; Al-Jamaan, 2018; Ibrahim, 2017; Muchtar et al., 2018; Rahman et al., 2017; Maxwell et al., 2012; Chowdhury et al., 2010; Fosberg et al., 2006; Jensen & Meckling, 1976).

The capital structure theory, originally developed by Modigliani and Miller in 1958 and revisited by them in 1963, mainly explores the relationship between the capital structure and the value of the firms. The researchers used several arguable yet questionable assumptions in which they proved that the capital structure should not influence the value of the firm. In the same time, they proved that there are some requirements which make the capital structure irrelevant; such as the use of both sources of finance by a firm that are debt and equity, ignoring the effect of taxes, the income generated in a certain period is not retained, and the financing mix used by a firm does not have any effect on the business risk (Hanna, 2020; Hirdinis, 2019; Ogbonna et al., 2019; Sharif, 2019; Thalib et al., 2019; Adamczyk et al., 2017; Vo, 2017; Arsov et al., 2016; Masidonda et al., 2013; Modigliani & Miller, 1963; Modigliani & Miller, 1958).

In the same time, the researchers also set certain requirements that made the capital structure relevant and consequently affect the value of the firm. Thus, they made arguments over the optimal capital structure and how can debt decrease the value of the firm if it reaches certain levels. In addition, most researches have emerged since then that aimed to supplement their findings. The researches were initially focused on minimizing the financing costs through recommending the

optimal capital structure, in other words, the targeted debt-to-equity ratio (Hanna, 2020; Hirdinis, 2019; Ogbonna et al., 2019; Sharif, 2019; Thalib et al., 2019; Adamczyk et al., 2017; Vo, 2017; Arsov et al., 2016; Masidonda et al., 2013; Modigliani & Miller, 1963; Modigliani & Miller, 1958).

The Static Trade-off Theory & The Pecking Order Theory

The Static Trade Off Theory, introduced by Myers (1977) and Pecking Order Theory introduced by Myers & Majluf (1984) have changed the emphasis toward exploring the factors influencing capital structure under different settings. Therefore, the researchers argued that the financing usually comes from issuing new equity, using internal funds and/or borrowing. Thus, the shift has been toward explaining the reasons of a particular behavior of companies regarding financing, rather than only determining one-size-fits-all solution (Al-Ghamdi et al., 2018; Kamau, et al., 2018; Mohammad, 2016; Memon et al., 2015; Lawal, 2014; Fama et al., 2001; Myers & Majluf, 1984; Myers, 1984; Myers, 1977).

In the same time, the researchers argued that the firms usually prioritize the selected sources of financing in which the firms prefer to use their internal funds, then borrowing and lasting raising capital. They also argued that this hierarchy of financing means assumes that firms prefer the internal sources when such funds are available, where such a financial behavior is more or less related to the agency theory. Likewise, the firms prefer the issuance of debt rather than equity as the cost of financing is lower. The researchers popularized such an argument due to that the fact that the managers know more about the firm than investors and when managers choosing to issue new equity, investors react by lowering the value of the new issuance as investors believe that managers are over-valuing the firm to their advantage (Al-Ghamdi et al., 2018; Kamau et al., 2018; Mohammad, 2016; Memon et al., 2015; Lawal, 2014; Fama et al., 2001; Myers & Majluf, 1984; Myers, 1984; Myers, 1977).

The Free Cash Flow Hypothesis

The free cash flow hypothesis, introduced by Jensen in 1986, assumed that managers tend to invest the excess of funds in negative net present value investments and consequently lower the valuation of the firm. It rationalizes its argument due to a key factor which is the conflict of interest between corporate managers and shareholders, in other words, the agency theory and the relevant agency cost. The article published by Jensen has also developed a theory to tackle such a problem where it recommends financing the company through debt to reduce the agency cost (Smith et al., 2019; Bhandari et al., 2017; Hau, 2017; Maksy, 2017; Maksy, 2016; Maksy, 2015; Maksy et al., 2014; Al Zararee, et al., 2014; Jensen, 1986).

In conclusion, the agency theory's findings suggest that the firm will have a high valuation when it is a large-size firm, has a high debt ratio, and uses debt more than equity to finance its assets (Dakhlallh et al., 2020; Khan et al., 2019; Al-Jamaan, 2018; Ibrahim, 2017; Muchtar et al., 2018; Rahman et al., 2017; Maxwell et al., 2012; Chowdhury et al., 2010; Fosberg et al., 2006; Jensen & Meckling, 1976). Moreover, the capital structure theory's findings suggests that the firm will have a high valuation when it uses the optimal capital structure; taking into consideration the acceptable level of debt to finance its assets (Hanna, 2020; Hirdinis, 2019; Ogbonna et al., 2019; Sharif, 2019; Thalib et al., 2019; Adamczyk et al., 2017; Vo, 2017; Arsov et al., 2016; Masidonda, et al., 2013; Modigliani & Miller, 1963; Modigliani & Miller, 1958). Furthermore, the pecking order theory suggests that the firm will have a high valuation, especially when it needs external financing, when it chooses to issue debt rather than equity as debt's cost is lower than the cost of issuing equity (Al-Ghamdi et al., 2018; Kamau et al., 2018; Mohammad, 2016; Memon et al., 2015; Lawal, 2014; Fama et al., 2001; Myers & Majluf, 1984; Myers, 1984; Myers, 1977). Lastly, the free

cash flow hypothesis also argues in favor of the agency theory, capital structure theory and the pecking order theory, where it states that the firm will have a high valuation when it finances its investment through the use of debt rather than its internal resources or issuing a new equity as managers tend to invest the firm's surplus in unfeasible investments and projects (Smith et al., 2019; Bhandari et al., 2017; Hau, 2017; Maksy, 2017; Maksy, 2016; Maksy, 2015; Maksy et al., 2014; Al Zararee et al., 2014; Jensen, 1986).

LITERATURE REVIEW

The literature review section shall discuss specifically the relevant and related literature to the research study in question. This section shall review and summarize 12 recent, relevant and related previous studies conducted in 9 different economies where those recent studies selected various sectors to explore the relationship, influence, and/or impact of Tobin's Q ratio, as a measurement of a firm's value, on the selected firm's total assets, free cash flow, debt ratio, and/or return on assets.

Firstly, Dang, Vu, Ngo & Hoang (2019) studied 214 companies listed in the Vietnamese Stock Market in which their study focused on the effect of the size of the firm, its capital structure, and profitability on the firm value. In addition, the researchers proposed four empirical hypotheses in which the first hypothesis assumes that there is a positive and significant relationship between the growth of the firm and its value. The second hypothesis assumes that there is a positive and significant relationship between the size of the firm and its value. The third hypothesis assumes that there is a positive and significant relationship between the capital structure of the firm and its value. The fourth and last hypothesis assumes that there is a positive and significant relationship between the profitability of the firm and its value. It is worth mentioning that the size of the firm is measured by using the total assets.

Hence, the researchers used two models to test their population in which they used the enterprise value as a dependent variable in the first model. Where the enterprise value was measured as the market capital and adding to it the long-term debt bearing interest and subtracting the sum of mentioned items from the cash and cash equivalent of the selected firms during the given period. The second model used Tobin's Q as a dependent variable. Additionally, the researchers used the simple linear regression to study the effect between the variables. Likewise, the researchers found that there is a positive and significant relationship between the firm value and its size and profitability. Similarly, the researchers found that the capital structure has a negative relationship with the firm's value. Lastly, the firm's growth has not shown any relationship with the firm's value during the given period (Dang, Vu, Ngo & Hoang, 2019).

Secondly, Khan, Noman, Mustafa & Abbasi (2019) conducted a research to study the relationship between the firm performance, which is measured by Tobin's Q that is the dependent variable, and the firm size, which is measured by its total assets, leverage, which is measured by debt ratio, as well as the board size and the number of outside directors. It is worth noting that the researches used the terminology of firm performance indicating the firm's value. Moreover, the researchers proposed three hypotheses where they used the multiple regression analysis to analyze the data collected from 130 non-financial listed companies in the Pakistani Stock Exchange between 2012 to 2015. In conclusion, the researchers found that the firm's leverage, influenced by the size of board of directors, has a significant and positive relationship with the firm's performance.

Thirdly, Abdul Salam & Shourkashti (2019) studied the firm performance and capital structure in Malaysia for the non-financial listed companies between 2005 to 2016. The researchers proposed three hypotheses, where the first hypothesis assumed that the capital structure has a negative and significant relationship with the firm's performance and the third hypothesis assumed

that there is no linear relationship between the capital structure of the firm and its performance. Additionally, the research used Tobin's Q, in addition to the firm's return on assets and return on equity, to measure the firm performance in which it also indicates the firm's value.

Also, the researchers used the debt ratio and long-term debt to total asset ratio to measure the capital structure. Besides, the researchers used the linear regression analysis to analyze the data collected for their research. To sum up, the researchers found that there is a negative and significant relationship between the capital structure of the firm and its value (Abdul Salam & Shourkashti, 2019).

Fourthly, Al-Majali & Shamsuddin (2019) studied the relationship between the capital structure and the performance of the selected 19 insurance companies listed in Amman Stock Exchange from 2008 to 2017. The researchers used to model to test the relationship between the variables where the first model used the return on assets as a dependent variable to measure the firm's performance and the second model used Tobin's Q as a dependent variable to measure the firm's performance. It is worth noting that the researchers measured the capital structure using two independent variables which are the short-term debt to total assets ratio and long-term debt to total assets. Additionally, the researchers used the multiple linear regression to analyze the collected data where they found the short-term debt and long-term debt has a negative and significant relationship with the second model.

In the same fashion, Zulvina & Adhariani (2019) studied the relationship between women's executive position in the listed manufacturing companies in the Indonesian Stock Exchange between 2016 and 2017 with their value. The researchers used Tobin's Q, as a dependent variable, to value the selected firms and used the size, represented by the total assets, profitability, represented by the return on assets, leverage, represented by debt ratio, and the age of the selected firms as control variables. However, they found that the independent variable that is having a chief executive officer female has no significant influence on the firm's value. In the same time, they found that the other independent variable that is having a chief financial officer female have a positive influence on the firm's value. Additionally, they concluded that the return on asset, debt ratio and total assets as well as the age of firm and having either a female chief executive officer or chief financial officer influence simultaneously the value of the selected firms.

Moreover, Husaini, Saiful, Saputra & Albra (2019) also used Tobin's Q as a dependent variable to measure the value of 95 Islamic and 858 non-Islamic listed companies in Indonesia Stock Exchange, where their study has 7 different independent variables. Three of which are the profitability, measured by the return on assets, size, measured by the total assets, and leverage, measured by debt ratio. Their study collected data from the above-mentioned listed companies between 2011 and 2015 as well as analyzing them through using the multiple linear regression, where they found that firstly the return on assets has a positive and significant relationship on the value of the Islamic and non-Islamic listed firms. Secondly, they found that debt ratio has a positive and significant relationship on the value of the Islamic and non-Islamic listed firms. Finally, they also found that there is no relationship between the total assets and the selected listed firms.

Furthermore, Kadioglu, Kilic & Yilmaz (2017) studied and tested the relationship between the free cash flow and firm's performance of 370 companies listed in Borsa Istanbul between 2009 and 2015. In addition, the performance of the firms was measured by using Tobin's Q. Overall, the researchers found that there is a negative and significant relationship between the free cash flow of the selected firms and the firm's value in which it such a conclusion supports the free cash flow hypothesis and the agency theory.

Similarly, Fu, Singhal & Parkash (2016) observed the listed companies in the United States from 1988 until 2014, where the researchers aimed to provide empirical evidence concluding the relationship between Tobin's Q and the future operating performance of those listed companies tested in their model. Their model used earnings before interest, taxes, depreciation and

amortization as the proxy of their operating performance for their sample. In addition, the sample of their study consisted of 56,719 firm/years. The researchers found that there is a positive and significant relationship between Tobin's Q ratio and earnings before interest, taxes, depreciation and amortization.

Likewise, Tabrizi (2016) examined the relationship between the capital structure, free cash flow and operational risks and the firm's performance in Iran between 2008 and 2012. Tabrizi (2016) proposed three hypotheses for his research where the all hypotheses assumed that there is a positive and significant relationship between the capital structure, free cash flow and operational risks and the firm's performance. In addition, the researcher used Tobin's Q as a dependent variable and measurement of a firm's performance. The researcher concluded that there is a positive and significant relationship between the capital structure and free cash flow and the firm's performance.

Additionally, Nakhaei & Jafari (2015) investigating the relationship between the capital structure and free cash flow with companies' performance in Tehran Stock Exchange concluded that there was a significant and negative relationship between the capital structure and the listed companies' value and a significant and positive relationship between the free cash flow and the companies' value between 2009 and 2013.

Besides, Mansourlakoraj & Sepasi (2015) conducted a study to the relationship between the corporate value, using Tobin's Q as a dependent variable, and the Lehn & Poulsen's Free Cash Flow, debt ratio and total assets, as independent variables for 80 listed companies in Tehran Stock Exchange between 2009 and 2013. The researchers proposed two hypotheses in which they assumed that there is an inverse significant relationship between the free cash flow and capital structure and the value of listed firms. Moreover, the researchers used multiple linear regression analysis to analyze the collected data, where they found that both free cash flow and capital structure have a positive and significant relationship with the firm's value.

Same as the previous studies, Al Ghifari, Triharjono & Juhaeni (2013) studied the food and beverage companies listed in Indonesia Stock Exchange between 2007 and 2011, where they chose the return on assets as a firm's performance measure against Tobin's Q Ratio as they argued that the return on assets can be firstly an essential factor for investors and shareholders in forming an investment decision regarding a certain listed company. Secondly, the return on assets can also be used to provide information about the future cash flow. Therefore, their hypothesis was based on the assumption that there should be a positive and significant relationship between the return on assets and the stock value and return on a particular fiscal year.

In addition, the researchers used sampling technique based on a pre-set criteria and the analysis method used is descriptive analysis in which the researchers used simple linear regression to study the relationship between the dependent variable, which Tobin's Q, and the independent variable that is the return on assets. The researchers concluded that there is a positive and significant relationship between the firm value using Tobin's Q ratio and the return on assets (Al Ghifari, Triharjono & Juhaeni, 2013).

In conclusion, there are several previous studies found that there is a positive and significant relationship between the firm value, using Tobin's Q, and its total assets (Dang et al., 2019; Zulvina et al., 2019); its return on assets (Dang et al., 2019; Zulvina et al., 2019; Husaini et al., 2019; Al Ghifari et al., 2013); its debt ratio (Khan et al., 2019; Zulvina et al., 2019; Husaini et al., 2019; Tabrizi, 2016, Mansourlakoraj et al., 2015); and its free cash flow (Tabrizi, 2016; Nakhaei et al., 2015; Mansourlakoraj et al., 2015).

However, some previous studies that the capital structure (Dang et al., 2019; Abdul Salam, et al., 2019; Al-Majali et al., 2019; Nakhaei et al., 2015) and the free cash flow (Kadioglu et al., 2017) have a negative relationship with the firm's value. In the same time, some previous studies found that total assets have no relationship with the firm's value (Husaini et al., 2019).

RESEARCH HYPOTHESES

This research paper has four main hypotheses to investigate which are:

H1: There is a significant and negative relationship between free cash flow and firm value.
H2: There is a significant and negative relationship between debt ratio and firm value
H3: There is a significant and negative relationship between return on assets and firm value.
H4: There is a significant and negative relationship between the total assets of the firm and firm value.

DATA AND METHODOLOGY

Nature of the Study, Sources of Data & Time Reference

This research paper is an explanatory research and following the quantitative approach to investigate the cause and effect of the variables proposed in this proposal. Whereas, the sources of data shall be the audited annual reports of the listed companies in the Amman Stock Exchange between 2005 and 2020.

The Population

The population of this research paper is 7 companies under mining and extraction industries sector listed companies in Amman Stock Exchange. Which are as follows:

Table 1
THE STUDY'S POPULATION (AMMAN STOCK EXCHANGE, 2021)

No.	Company Name	Year of Establishment	Reuters Code	Market	Listed Trading Shares	Data Range
1.	The Arab Aluminum Industry Company	1976	AALU	First Market	6,750,000	2005 – 2020
2.	The National Steel Industry Company	1979	NAST	Second Market	2,941,768	2005 – 2020
3.	Jordanian Phosphate Mines Company	1949	JOPH	Second Market	82,500,000	2005 – 2020
4.	The Arab Potash Company	1956	APOT	First Market	83,317,500	2005 – 2020
5.	The Jordan Steel Company	1993	JOST	Second Market	35,000,000	2005 – 2020
6.	National Aluminum Industries Company	1994	NATA	Second Market	9,000,000	2005 – 2020
7.	Northern Cement Company	2007	NCCO	First Market	55,000,000	2010 - 2020

The Research Model

This research paper will use Lehn & Poulsen Model for the free cash flow, total assets for the firm's size, return on assets, debt ratio for capital structure; and Tobin's Q for the firm value.

$$Ln(Tobim\ Q) = \alpha + \beta 1 Ln(FCF)i,t + \beta 1 Ln(DR)i,t + \beta 1 Ln(TA)i,t + \beta 1 Ln(ROA)i,t + \in i,t$$

In which:

Ln (Tobin Q): the firm value is calculated by Tobin's natural logarithm which is equal to market value of the firm divided by substitution value of assets. The market value equals total value of common and premium stocks plus book value of all debts. The substitution value of assets is also equal to their book value.
Ln (FCF): Lehn and Poulsen (1989)'s model was used to measure free cash flow. According to this model, FCF equals to operating profit before depreciation and after payable tax, interest, and premium and common stock dividends which is calculated as follows:
$FCF_{i,t} = (INC_{i,t} - TAX_{i,t} - INTEXP_{i,t} - PSDIV_{i,t} - CSDIV_{i,t})/A_{i,t-1}$
$FCF_{i,t}$: cash flow of firm i in the year t
$INC_{i,t}$: operating profit before depreciation of firm i in year t
$TAX_{i,t}$: all payable tax of firm i in year t
$INTEXP_{i,t}$: all payable interest of firm i in year t
$PSDIV_{i,t}$: payable premium stock profit of firm i in year t
$CSDIV_{i,t}$: payable common stock profit of firm i in year t
$A_{i,t-1}$: total book value of assets in year t-1
Ln (DR): natural logarithm of debt leverage as the representative of capital structure which is equal to all debt divided by assets.
Ln (TA): natural logarithm of all assets.
Ln (ROA): the firm's net income divided by its total assets

ANALYSIS & RESULTS

This research paper uses Microsoft Excel to analyze the data of 7 sample companies and the final test results are shown in from table 2 to table 6.

Descriptive Statistics

Table 2
DESCRIPTIVE STATISTICS

Descriptive Statistics	Observations	Minimum	Maximum	Mean	Standard Deviation
Tobin's Q Ratio	107	0.45231	5.63530	5.18298	1.39191
Free Cash Flow	107	(0.22060)	0.38694	0.60754	0.03535
Debt Ratio	107	0.04880	0.75240	0.70360	0.32778
Total Assets	107	2,243,023.00	1,223,269,000.00	1,221,025,977.00	289,859,853.15
Return on Assets	107	(0.22160)	0.43940	0.66100	0.05624

Table 1 presents the descriptive statistics on the dependent variable and the four independent variables. From the above table, Tobin's Q Ratio's minimum value is 0.45231 which was for National Aluminum Industrial in 2019, while its maximum value was 5.63530 which was for The Arab Potash in 2007. Additionally, the range between the maximum and minimum value is 5.18298. Moreover, the value of the standard deviation of Tobin's Q is lower than the mean in which it indicates that data is clustered around the mean (Groebner et al., 2005).

Furthermore, the free cash flow's minimum value was -22.060% which was for National Steel Industry in 2008, and its maximum value was 38.694% for Jordan Phosphate Mines in 2008, whereas the range between the maximum and the minimum values was 60.754%. Additionally, the

standard deviation is higher than the mean in which it also indicates that its data is scattered from the mean (Groebner et al., 2005).

Moreover, the debt ratio's, which is representing the capital structure, minimum value was 4.88% which was for Northern Cement in 2010 and the maximum value was 75.24% for National Steel Industry in 2009, while the range between the maximum and the minimum values was 70.36%. Furthermore, the standard deviation of the debt ratio is lower than its mean which also indicates that the data is clustered around the mean (Groebner et al., 2005).

Likewise, the minimum value of the total assets, which is representing the size of the firm, was JOD 2.243 million which was for National Steel Industry in 2013 and its maximum value is JOD 1.223 billion which was for The Arab Potash in 2011. In addition, the range between the maximum and minimum values was JOD 1.221 billion and the mean of the total assets is lower than its standard deviation indicating that the data is scattered from the mean (Groebner et al., 2005).

Lastly, the return on assets' minimum value was – 22.16% which was for National Steel Industry in 2008 and its maximum value was 43.94% which was for Jordan Phosphate Mines in 2008, while the range between the maximum and minimum value was 66.1%. Furthermore, the mean is also lower than the standard deviation which means that the data is also scattered from the mean (Groebner et al., 2005).

Pearson Correlation Coefficient

This study uses Pearson Correlation Coefficient to measure the direct and the degree of the relationship between the variables. In addition, the dependent variable is Tobin's Q and the independent variables are total assets, return on assets, debt ratio and free cash flow. Furthermore, the Pearson Correlation Coefficient's range is between -1 to +1 where the positive sign indicates positive relationship and the negative sign indicates an inverse relationship (Groebner et al., 2005).

As it can be seen from Table 3, the Tobin's Q's relationship is positive with the free cash flow, total assets, and return on assets. However, its relationship with debt ratio is negative. Moreover, Tobin Q Ratio's relationship with the return on assets is almost equal±0.70 which indicates that there is a high and significant relationship between the firm's value and its return on assets. In the same time, there is a moderate positive relationship between Tobin Q Ratio with the free cash flow and total assets as they are 0.41 and 0.34 respectively. Lastly, the debt ratio shows a moderate negative relationship with the firm's value as it is way below±0.7 (Groebner et al., 2005).

Table 3
PEARSON CORRELATION COEFFICIENT

Correlation Coefficient	Tobin's Q Ratio	Free Cash Flow	Debt Ratio	Total Assets	Return on Assets
Tobin's Q Ratio	1				
Free Cash Flow	0.406912031	1			
Debt Ratio	-0.332963196	-0.435843485	1		
Total Assets	0.336839902	0.265166038	-0.28412189	1	
Return on Assets	0.69304728	0.806903977	-0.450379642	0.379680471	1

To sum up, there is firstly a positive and significant relationship between the firm's value and its return on assets. Secondly, there is a positive and moderate relationship between the firm's value and its free cash flow and its total assets. Finally, there is an inverse and moderate relationship between the firm's value and its debt ratio (Groebner et al., 2005).

Multiple Regression Analysis

This research paper uses the multiple regression analysis to project the variation in the firm's value using Tobin's Q ratio accounted by the independent variables. In addition, the multiple regression analysis is a statistical tool acting to investigate the linear relationship between the variables. Likewise, it is a useful tool to predict the firm's value (Groebner et al., 2005). The multiple regression equation is illustrated as follows:

$$Ln(Tobim\ Q) = \alpha + \beta 1 Ln(FCF)i,t + \beta 2 Ln(DR)i,t + \beta 3 Ln(TA)i,t + \beta 4 Ln(ROA)i,t + \in i,t$$

As it can be seen from Table 4, the multiple R of the research study's multiple regression indicting that there is 75% while the R Squared is 55% and Adjusted R Squared is 53% indicating that the research paper's model explains from 53% to 75% all the variability of the data around its mean. However, the Standard Error is 61% which can estimate the deviation of the sample and its distribution (Groebner et al., 2005).

Table 4
REGRESSION STATISTICS

Multiple R	0.743666086
R Square	0.553039248
Adjusted R Square	0.535511375
Standard Error	0.608870207
Observations	107

Moreover, Table 5 shows that the Significance F is below 5% and its percentage is nearly zero. Therefore, the result of the multiple regression analysis can be accepted based on the F-Test's results (Groebner et al., 2005).

Table 5
ANALYSIS OF VARIANCE (ANOVA)

ANOVA	df	SS	MS	F	Significance F
Regression	4	46.7881833	11.69704583	31.55198917	4.25791E-17
Residual	102	37.81373871	0.370722929		
Total	106	84.60192201			

Finally, Table 6 summarizes the summary output of the multiple regression analysis in which it shows that free cash flow and return on assets' P-Value is below 5% and the debt ratio and total assets' P-Value is above 5%, where the proposed equation of firm's value shall be as follows:

$$Ln(Tobim\ Q) = 1.105097625 + (5.037420511 Ln(FCF)i,t + (0.329761218) Ln(DR)i,t + (0.000000000) Ln(TA)i,t + 9.56357647 Ln(ROA)i,t + \in i,t$$

Table 6
MULTIPLE REGRESSION ANALYSIS SUMMARY OUTPUT

	Coefficients	Standard Error	t Stat	P-value
Intercept	1.105097625	0.179242444	6.16537915	1.42338E-08
Free Cash Flow	-5.037420511	1.295826799	-3.887418067	0.000180491
Debt Ratio	-0.329761218	0.429155994	-0.768394763	0.444028094
Total Assets	1.21095E-10	1.53745E-10	0.787632256	0.432738329
Return on Assets	9.56357647	1.129086992	8.470185682	1.93237E-13

CONCLUSION

This research paper concludes firstly only Tobin Q Ratio and debt ratio have a lower standard deviation than its mean. Thus, this indicates that the other independent variables used were scattered from the mean. Secondly, this research paper demonstrates statistically, using Pearson Correlation Coefficient, that there is a positive relationship between the firm's value and its free cash flow, its total assets and its return on assets as well as demonstrating that there is a negative relationship between the firm's value and its debt ratio. Thirdly, this research paper demonstrates statistically, using the P-Value, that there is a significant relationship between the firm's value and its free cash flow and return on assets as they are lower than 5%. However, it also demonstrates statistically, using the P-Value, that the relationship between the firm's vale and its debt ratio and total assets are not statistically significant.

Therefore, this research paper firstly rejects the first hypothesis which assumes that there is a significant and negative relationship between the free cash flow and firm value as there was a significant and moderate positive relationship between the free cash flow and firm value for the period in question.

Secondly, this research paper rejects the second hypothesis which assumes there is a significant and negative relationship between debt ratio and firm value as the relationship between of them is insignificant and moderately negative,

Thirdly, this research paper also rejects the third hypothesis which assumes that there is a significant and negative relationship between return on assets and firm value as the relationship between of them is significant and their relationship is positive.

Finally, this research paper rejects the fourth hypothesis which assumes that there is a significant and negative relationship between the total assets of the firm and firm value as the relationship between of them is insignificant and moderately positive.

Therefore, the results of this research paper agree partially with the findings of both Mansourlakoraj & Sepasi (2015), who found that both free cash flow has a positive and significant relationship with the firm's value using Tobin's Q. However, it contradicts with them regarding the positive and significant relationship between the capital structure and the firm's value using Tobin's Q. In addition, the research paper agree with the findings of Al Ghifari, Triharjono & Juhaeni, (2013); who found that there is a positive and significant relationship between the firm value using Tobin's Q ratio and the return on assets.

RECOMMENDATIONS FOR FUTURE RESEARCH

It has been recommended that future studies in this field takes into consideration the aftermath of the COVID-19 pandemic on this sector as it is expected that the international trade and local demand shall decline sharply in which it shall affect the valuation of those firms as it is expected to have a lower return on assets, higher debt ratio, negative free cash flows and shirking the size of their total assets.

LIMITATION

This research paper is limited to the listed firms in the mining and extraction sector in Amman Stock Exchange. Therefore, future studies should take into consideration research other private firms not listed in Amman Stock Exchange.

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