AN EMPIRICAL INVESTIGATION OF THE IMPACT OF FIRM LIFE CYCLE USING THE PECKING ORDER THEORY

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ABSTRACT

The main aim of this empirical paper is to examine the pecking order theory of financing between Non-financial Jordanian firms with respect to growth and maturity stages of the life cycle. The association between the life cycle and the funding classification for the years 2000 to 2020 in non-financial companies is investigated through the panel data estimation technique (Fixed and Random Effects). The data is collected from Amman Stock Exchange for the 50 non-financial companies that completed two life cycle stages (35 industrial and 15 services companies). Shyam-Sunder and Myers's (1999) model of pecking order model is improvised in this research paper by controlling for firms' characteristics (profitability and size). The findings of the fixed effect model confirmed the effect of the pecking order model on the debt of Jordanian companies, which are in the growth and maturity phases of the life cycle. The pecking order is followed by the firms which are in the growth and maturity stages.

Key Words: Life Cycle, Pecking Order Theory, Profitability, Deficit, Panel.

INTRODUCTION

The pragmatic presentation of the pecking order theory of financing as given by Myers (1984); Myers and Nicholas (1984) is debatable. The basis of the theory lies in the asymmetric information among the investors and managers of the firm. In order to meet the financial requirements of the firm, primarily the internal funds are utilised. Debt and equity are the last steps taken in that order to fulfil the financial needs. The practical evidence of the theory is diversified because of the drawbacks of the applied empirical tests. The results show that the theory's main estimate, including the asymmetry in the information leading to conduction of pecking order, has not been evaluated adequately.

Therefore, this research paper examines the estimation as mentioned above with respect to the firm's life cycle. It is identified in this paper that growth and maturity are the two important life cycle stages of the firms. The pecking order theory tops as the result of the pre-existing asymmetry of the information in financial markets. Most commonly, the managers have access to the information of the future of the business, which lacks investors. Along with the costs of the release of new securities transactions, the companies must deal with the information expenditure, which increases with asymmetric information. In this essence, the value of the shares in the capital market might be devalued due to information symmetry; this is mostly observed in the process of issuing new shares. The managers will then hold back the launch of profitable projects because of the risk involved in the financial instruments (Myers & Nicholas, 1948).

However, the managers are unauthorised to make the decisions regarding the funding of projects which reduces the capital of the company, and therefore, they opt for eliminating

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external funding. A hierarchy order is established in financing, it starts with the less impacted financial sources by the cost of information and provides the low risk. The ideal source of financing is internal funds, short term debt and long term debt in the respective order. The last resort is the release of new shares, which is related to greater information costs (Donaldson, 1961).

THEORETICAL BACKGROUND (PECKING ORDER THEORY)

The pecking order theory states that the financing cost goes higher with asymmetric information. The three main sources of financing include internal funds, debt and new equity. Most of the companies rank their financing sources in the same order, ranking from first to last. Hence, the first choice is internal funding, then debt and lastly, equity. This theory sustains businesses by following the hierarchy of the sources of financing and inclines towards internal funding mostly, then debt and equity. Thus, the nature of debt chosen by the firm can behave as an indication of the requirement of external finance. The pecking theory is promoted by Myers and Nicholas (1984), in which they debate on equity being the less suitable method to increase capital due to the assumptions of managers over-evaluating the value of the firm while issuing new equity in order to gain an advantage resulting in investors placing less value to the new equity issuance.

LITERATURE REVIEW

The objective of financing is based on determining the degree of asymmetry in the information; the leaders follow a financial policy to focus on reducing the costs related to the asymmetry and select internal financing in comparison to external financing. Therefore, the leader highlights inclinations in the succeeding sequence: internal financing, less risky debt, more risky debt and the rise in investment (Myers, 1984). The prospective investors of the company undermine the actual value of the possessions and cause underestimation of the value of those possessions. This misinformation is harmful to the company, which is in the process of issuing new shares to fund an emerging project. The economic studies depict that a deterioration of the progress supplements the creation of information representing an important issue of new shares. The outcome of this mechanism directs the companies to issue new shares after utilising the other methods of financing. This leads to the principles followed by the POT "Companies prefer internal financing; if external funding is required, companies will finance primarily by debt and by issuing new shares" (Myers, 1984).

The analysis of the pecking order theory is performed by using the test of a regression introduced by (Shyam-Sunder & Myers, 1999). The results favour the theory of pecking order through companies' envisions of financing the discrepancies predicted with the debt. Shyam-Sunder and Myers (1999) also stated that the outcome of the pecking order theory holds higher arithmetical control when compared to the test of the theory. Chirinko and Singha (2000) inquired the clarification of the test of regression (Shyam-Sunder & Myers, 1999) which revealed that the equity inquiries could possibly form a negative polarisation in the test of regression. Frank and Goyal (2003) described that equity in question shadows the shortfall in financing closely, whereas the debt does not follow the same with regard to the theory of hierarchical order (Loughran & Ritter, 2004). In addition to this, the pecking order theory can also be tested otherwise while the company's debt is tested on the basis of independent variables which recapitulate the necessary financial behaviour.

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Shyam-Sunder and Myers (1999) gave a statistical model for the evaluation of the financial hierarchy in relation to regression equations. They also suggested that the pecking order is a good elaborator of firms' financial behaviour. Lemmon and Zender (2010) stated that their findings also support the theory of pecking order. In contrast, Frank and Goyal (2003); Fama and French (2005) found out that companies practice financing their shortfalls through equity issues. Seifert and Gonence discovered minimum support for this theory. Leary and Robert (2010) observed that their outcomes were in comparison with the pecking order (Helwege & Liang, 1996). The companies are in favour of issuing actions, especially when they are inadequate (Baker & Wurgler, 2004). Subsequently, the theory forecasts an order of hierarchy in the policy of financing of companies. This order is guided by the financial sources, which are least focused on the information costs and are simultaneously safer. Internally produced funds are the main source of financing, followed by the safer short duration debt and, lastly, risky long-duration debt.

The only remaining option is the new capital as a funding source with the greatest information costs (Donaldson, 1961; Myers & Nicholas, 1984). The most recent encouragement for the pecking order is the adverse selection formed by (Myers & Nicholas, 1984; Myers, 1984). The main idea revolves around the owner-manager of the company who is familiar with the actual values of the firm's possessions and the opportunities for growth (Amihud, 2002). The external investors can speculate those values; therefore, if a manager offers to trade actions, the external investor tries to find the cause behind such actions of the manager. In most cases, the manager of the underrated company will be motivated to trade actions while the director of the underrated company will oppose the trade.

The authorisation of the current stakeholders to participate in the equity issue will make the process of adverse selection easy. In their model, the companies that target more proportion of their shareholders to participate in new issues experience less adverse selection and are inclined to issue uninsured rights to companies with prospects of less current shareholders. The firms having prospects of current transitional shareholders take preference while issuing equity utilising standby rights. It is termed as the pecking order of the equity floatation method. Halov and Heider stated that the standard pecking order is a basic case of adverse selection; when firm value is under adverse selection, the firms inclines towards issuing debt over external equity and apply the standard pecking order model. However, in the case of asymmetric information of risk, the adverse selection gives more weightage to debt apply, and firms choose to issue external equity (Agca & Mozumdar, 2004). Thus, the adverse selection can cause a trend of choosing foreign debt or external equity in accordance with the problems related to asymmetric information of risk or value.

Donaldson (1961) first suggested the pecking order theory, and Myers (1984); Myers and Nicholas (1984) further stated that the pecking orders denote the choice of the managers. Myers (1984) discovered that the companies which choose internal or external financing rely on adverse selection. Therefore, the supplementary eternal funds are required by companies and the managers to select the debt on stockholders' equity as a result of the lack of cost of information associated with the financing of the debt.

Myers and Nicholas (1984) record how lopsided data (between better-educated supervisors and less-educated external financial backers) leads firms’ inclination in the request for inside reserves, more secure outer assets and more dangerous outside reserves by means of the Issue-Invest Model. For less-educated external financial backers, equity is completely more dangerous than debt and financial backers, for the most part, demand a higher pace of return on

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equity than on debt. In relation to a firm, retained earnings are better than debt financing and equity financing. Despite the fact that Bharath et al. (2009) presented proof on the relationship between information imbalance and the inclination for the financing of the debt, they record additionally an accuracy restricted of the pecking order hypothesis to anticipate the choices of financing made by the organisations with solid asymmetry data. Firms that can get to the public debt market appreciate higher debt limits and are more averse to under leverage.

Lemmon and Zender (2010) additionally utilised the market access of the public debt with the intermediary for the limit of the debt and showed that the organisations which can give public debt to be sure to give more debt to meet their financing needs. Subsequently, if the entrance of the organisations to the market of the public debt diminishes rapidly when the data imbalance expands, the moderate reliance that the organisations of high data deviation have on the financing of the debt ought not to come like astonishment since they are not given lower debt limits in the private debt market (Miller & Friesen, 1984). Leary and Roberts (2010) utilised a creative empirical approach and reasoned that the organisations appear to be bound to follow the pecking order theory when the data lopsidedness is low. Exhaust and Stoja tracked down that the organisations of the new economy issue principally equities to close the variety contrasted with the objective of the leverage.

DATA AND SAMPLE SELECTION

Information has been gathered principally from the Amman Stock Exchange Website and the Annual Reports of 50 nonfinancial firms (35 Industrial and 15 Services) over the 2000-2020 period. Firms have been characterized as per two life cycle stages, and they are growth and maturity. Life cycle is centered around a depiction of the firms' set of experiences where these stages are precisely defined, by and large, each stage goes on for a considerable length of time. Appropriately, we set the length of each stage to be six years. The growth stage is set to be the initial six-year time frame after the time of the company’s initial public offering (IPO) since the IPO is itself a significant financing choice that a firm needs to make. Here, we treat the IPO as the beginning stage of the growth stage (or the "new growth" stage).

DeAngelo et al. (2006), among others, have tracked down that a firm's attraction to deliver dividends is an element of which stage a firm is a major part of its life cycle. Specifically, Bulan et al. (2007) found that the mature firms are the main dividend initiators. This paper distinguishes firms in their experienced stage by their dividend commencement history. In the first place, we incorporate the organization as in mature stage if we find successive six-year time spans for which a firm has positive dividends (Nehru, 2016). We consider these 6-year profit instalment periods as the developed phase of a company's life cycle. Observing guideline practice, we reject financial firms since they have distinctive monetary construction parts.

MODEL DEVELOPMENT

This paper investigates the effect of the life cycle in pecking the sources of funds, particularly if the pecking order hypothesis holds in various phases of organizations’ life cycle (growth and maturity). Hence, the dependent variable is Debt Ratio, which is the leverage ratio and the independent variables are; the deficit ratio as an action identified with pecking order hypothesis, a dummy variable of the life cycle (1 in case the organization is in growth stage and 0 in case it is in maturity stage), control factors, for example, profitability which is the return on assets (ROA) and the size of the organization measured by the natural logarithm of total assets.

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Dependent Variable: Change in Debt Ratio (ΔDR)

Leverage is the utilization of acquired cash to build profits from an investment. Obviously, leverage can likewise blow up and amplify misfortunes instead of upgrading them. Debt Ratio is the leverage ratio calculated by dividing liabilities by total assets. This action gives a speedy, however not generally dependable, sign of how much leverage an organization is employing. Consequently, the dependent variable is the change in debt ratio, which is the net debt issued.

Independent Variables

Deficit

As per the pecking order hypothesis initiated by Shyam-Sunder and Myers (1999), change in debt is the aftereffect of a requirement for external assets instead of as an impartial debt supported by an incomplete change mechanism. We measure this variable by the distinction of employments of funds and inward sources of funds. This shortage is financed with debt or potential value. If organizations follow the pecking order, changes in debts should follow changes in the deficiency one-for-one. This paper expects a positive connection among shortfall and change of debt proportion yet a negative connection between the quadratic deficiency and the change of debt ratio.

Life Cycle

In the company's life cycle context, an expectation holds that asymmetric information problems are more severe among young growth firms compared to firms that have reached a stage of maturity. Consequently, the theory predicts that the early fast-progressing companies, which are more likely to bear higher adverse selection costs due to the asymmetric information, are those which should follow the pecking order more closely. The empirical data show the opposite; it is older, and the larger companies follow the pecking order more closely (Frank & Goyal, 2003; Fama & French, 2002). Accounting for the constraints of the debt capacity, Lemmon and Zender (2007) find evidence supporting the pecking order among a broad sample of companies. Results suggested that growth firms have a greater requirement for external financing and have smaller debt capacities compared to mature firms (Evans, 1987). These two factors greatly affect a firm's financing decision, and it is difficult to assess the empirical performance of the pecking order theory without accounting for differences in these characteristics across firms (Lemmon & Zender, 2010).

While sorting firms according to maturity and growth stages, we are confident that the external financing needs and levels of debt capacity are significantly homogeneous. In addition, within a life cycle stage and upon sufficiently controlling a firm's debt capacity, firms with the highest adverse selection costs due to information asymmetry are the ones following the pecking order more closely, consistently with the theory. The life cycle variable has been measured as a dummy variable of the life cycle (1 if the company is in the growth stage and 0 if the company is in the maturity stage). This paper expects that there is a relation between life cycle and the pecking order theory.

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Profitability

The literature argued that profitable firms benefit from leverage and are more likely to use more debt. In this way, profitability provides a positive signal to lenders interpreting this growth as a good indicator of future repayments. Following Mabrouk and Boubaker (2019), we measured the variable by its earnings on total assets. There is an assumption about the existence of a negative link between profitability and debt. Following many studies, the profitability variable has been calculated by the return on assets (ROA). This paper expects that there is a negative relationship between profitability and the change of debt ratio.

Size

Several studies confirmed the existence of a significant impact of size on the firm's debt ratio. Size is computed as the natural logarithm of total assets (Frank & Goyal, 2003). Considering the lower bankruptcy costs due to higher diversification in larger firms, the trade-off theory predicts relatively more debt. However, the issue costs decrease with firm size, both for equity and bonds (Lemmon & Zender, 2003; Mueller, 1972). In addition, size is a sign of the firms' strength for lenders, since assets are considered as collateral (Fama & French, 2002). This paper expects that there is a positive relationship between the size and the change of debt ratio.

Model

Based on the previous section the following model has been developed to empirically investigate the impact of life cycle on the pecking order theory.

$$\Delta Debt_{it} = b0 + b1\ Deficit_{it} + b2\ Deficit_{it}2 + b3\ LifeCy + b4\ ROA + b5\ lnTA + \varepsilon_{it}$$

Where ΔDebt is net debt issued in period t scaled by total assets at the beginning of period t (assett-1), Deficit is the financing deficit in period t scaled by total assets at the beginning of period t, Deficit 2 is the quadratic specification which is used to account for binding debt capacity constraints, LifeCY is the dummy variable of life cycle (1 if company is in growth stage and 0 if company is in maturity stage), ROA is the return on assets as proxy of profitability and LnTA is the natural logarithm of total assets as a proxy of size.

RESULTS AND ANALYSIS

Based on the below, Table 1 provides descriptive statistics for firms in each life cycle stage. On average, firms in the mature stage are older, larger and more profitable compared to firms in the growth stage. We find that mature firms have higher leverage, consistent with having larger debt capacities, while growth firms show larger financing deficits (external finance). In terms of information asymmetry, growth firms are less liquid and have higher bid-ask spreads, consistent with greater adverse selection costs (Ogunsiji & Ladamu, 2017). Overall, these patterns conform to our expectations of key firm attributes in these two stages of a firm's life cycle. More importantly, the findings that growth firms have greater financing deficits but smaller debt capacities imply that growth firms shall reach their debt capacities more often than mature firms. Additionally, the significance of the Hausman test clearly suggests that the fixed effect model is the best specification to estimate the model.

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This table reports summary statistics by life cycle stage, namely growth and maturity. The t-test *** significant at 10% level; ** significant at 5% level; * significant at 1% level.

Table 1
SUMMARY STATISTICS BY LIFE CYCLE STAGE

	Mean		Standard Deviation	
	Growth	**Maturity**	**Growth**	**Maturity**
Age (years)	10.61**	13.05	11.23	14.63
Annual sales growth rate (%)	35.77**	9.78	53.48	11.45
Market to Book ratio	1.87**	1.45	2.97	1.20
Return on Assets (%)	-0.15**	10.53	17.45	8.79
Dividend per share ($)	0.00**	0.50	0.00	1.00
Retained earnings to total equity ratio (%)	-37.46**	24.23	72.06	20.97
Leverage (%)	53.74*	49.03	27.79	10.48
Financing Deficit (%)	12.70**	6.45	43.46	9.07

The following results in Table 2 show that the results are consistent with firms following the pecking order; the coefficient on the deficit is positive, and the coefficient on the deficit-squared is negative. Both growth and mature firms are issuing debt first, while equity is the resulting residual source of financing upon reaching their debt capacities (Mabrouk & Boubaker, 2019). By making comparisons across life cycle stages, however, we find that mature firms have significantly higher debt-deficit sensitivities indicating that mature firms follow the pecking order more closely. This is contrary to conventional wisdom since we would expect growth firms to suffer more from information asymmetry problems, and Bulan and Yan (2009) document this finding as a maturity effect in firm financing choice. Mature firms are older, more stable, and highly profitable with few growth opportunities and good credit histories. Hence, they can borrow more easily and at a lower cost. Therefore, by the very nature of their life cycle stage, mature firms are predisposed to be utilizing debt financing before equity (Apsari & Rasmini, 2019).

Moreover, the findings further supported the Pecking Order Theory argument stating that highly profitable firms prefer to use internal financing rather than debt in both the life cycle stages. Pecking Order Theory assumes information asymmetry, and the results indicated that information asymmetry in the Jordanian market was a vital factor affecting the capital structure decisions for non-financial companies. This result is in line with Nguyen, who argued that the profitable Chinese companies tend to follow the pecking order theory upon using the internal sources initially, then debt and equity.

The results also suggest that larger companies tend to usually follow the Pecking Order Theory. In other words, the debt capacity of large companies will be higher than that present in small companies. However, big firms often have more diversified fields of business than small ones, thereby facing lower bankruptcy costs and easier access to low-risk debt securities (Palma et al., 2018). Furthermore, bigger firms usually have more tangible assets, thus demonstrating their ability to repay loans much better and then the smaller firms. Meanwhile, because of the information asymmetry between "inside" and "outside", Jordanian firms prefer using internal capital over debt securities. However, this contradicts the findings of Kester, who argued that big firms listed on capital markets often have less information asymmetry than small ones, so they can access the debt or equity markets at a lower cost than small companies.

Hausman test favored the fixed effect regression to estimate the model developed in the previous section. *, ** and *** significant at the 1%, 5% and 10% level respectively.

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Table 2 RESULTS	
	Coefficient
Deficit	0.328**
	(0.051)
Deficit2	-0.083*
	(0.004)
LifeCy	0.037
	(0.000)
ROA	-0.073*** (0.083)
LnTA	0.028*
	(0.000)
Constant	0.001*
	(0.000)
Adjusted R2	0.249

CONCLUSION

In this paper, we identify firms in two major life cycle stages, namely growth and maturity, to evaluate the central prediction of the Pecking Order Theory. Within a life cycle stage, where levels of debt capacity and external financing needs are homogeneous and upon sufficiently controlling for profitability and companies size, we find that firms with the highest adverse selection costs are the ones following the pecking order more closely. This evidence is consistent with the basic premise of the theory.

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