Journal of Applied Business and Finance Researches

Volume 3, Issue 2: 33-39 (2014)

JABFR JOURNAL OF APPLIED BUSINESS AND FINANCE RESEARCHES

Effect of Capital Structure, Free Cash Flow and Diversification on Firm Performance

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ABSTRACT: This paper empirically investigates the effect of capital structure, free cash flow and diversification on firm performance. To collection data we use RahAvard Novin software and Tehran stock exchange website and for data classification of firms and Industries from Excel 2010 software. We use the E-views version 7 and pooled least Square (PLS) to analysis data. The results of the analysis of the data showed that capital structure and firm diversification (related & unrelated) has a positive effect on firm performance. Also, the results showed that free cash flow has a negative effect on firm performance.

Key words: Capital Structure, Free Cash Flow, Diversification, Firm Performance, Entropy.

Received 29 Mar. 2014
Accepted 22 May. 2014

ORIGINAL ARTICLE

INTRODUCTION

Since Modigliani and Miller's (1958) seminal paper, the choice between debt and equity has been extensively investigated in the finance literature. As Weston and Brigham (1981) mentioned, however, there is wide disagreement over what determines the choice of capital structure and how this choice affects firm performance. Conversely, Barton and Gordon (1987) argued that a corporate strategy perspective on managerial choice would yield a more detailed understanding of capital structures and their effects. Along the same lines, Andrews (1971) claimed that capital structure decisions are made based on managerial perspectives on the value of the firm in terms of internal and external business factors. This is referred to as the "Strategy–Capital structure" relationship. This concept implies that corporate capital structures and strategic behavior are more accurately understood through a holistic approach that brings together corporate strategic perspectives and extant financial research. Following the "Strategy–Capital structure" argument, the current study examined the effects of capital structure, free cash flow, diversification on firm performance (park & Jang, 2013). The Free Cash Flow Theory (Jensen, 1986) explains that managers have an incentive to hoard cash to increase the amount of assets under their control and to gain discretionary power over the firm investment decision. With the cash holding, they do not need to raise external funds and could undertake investments that have a negative impact on shareholders' wealth. Thus, management may hold excess cash simply because it is risk averse. The possibility that management could be using cash for its own objectives raises the costs of outside funds, because outsiders do not know whether management is raising cash to increase firm value or to pursue its own objectives. Finally, management may accumulate cash because it does not want to make payouts to shareholders, and wants to keep funds within the firm. Having the cash, however, management must find ways to spend it, and hence chooses poor projects when good projects are not available (Opler, 1999).

Literature review

Capital structure and firm performance: The choice between debt and equity has been a major topic in the finance literature since Modigliani and Miller (1958) argued that capital structure is not related to firm value. However, they eventually reversed this claim, stating that corporate value is maximized when it is financed entirely with debt (Modigliani and Miller ,1963; Jang et al., 2008). In order to understand the rationale behind the relationship between capital structure and firm performance, this section reviews three theories: trade-off theory, pecking-order theory, and agency theory

The trade-off theory posits that there is an optimal level of capital structure in which firm value is maximized. At the optimal point, the marginal benefits of debt equal the marginal costs of debt and firm performance is maximized (Tang and Jang, 2007; Jang et al, 2008). Compared with equity financing, debt is cheaper because it is tax deductible. However, an

excessive use of debt is risky due to the higher likelihood of bankruptcy. Thus, the trade-off theory argues that firms set an optimal target debt ratio determined by the trade-off between the benefits (tax deductions) and costs of debt) bankruptcy costs). A number of empirical studies have attempted to find the determinants of capital structure using the trade-off framework, including those by Ferri and Jones (1979), Castanias (1983) ,(and Tang and Jang (2007). Bradley et al. (1984) reviewed the theory and evidence of the trade-off hypothesis. Under the trade-off framework, Kester (1986), Titman and Wessels (1988,(and Rajan and Zingales (1995) found strong support for a negative relationship between leverage and performance. On the other hand, Myers and Majluf (1984) argued that there is an asymmetric information problem between managers and investors. Investors would like to discount a firm's new securities when they are issued. Thus, managers can anticipate price discounts in advance. As a consequence, in order to avoid distorting investment decisions managers prefer internal financial resources, such as retained earnings, to external financial sources such as debt and equity. Myers (1984) suggested that the costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model. This is referred to as the pecking-order theory. Pecking-order refers to the idea that in order to minimize asymmetric information and other financing costs, firms should first finance investments with retained earnings, then with safe debt, then with risky debt, and finally with equity. In this argument, Myers (1984) defined "safe debt" as newly issued debt that is default-risk free. According to simple pecking order theory, debt typically grows when investments exceed retained earnings and falls when investments are less than retained earnings. Thus, if profitability and investment outlays are persistent, the simple version of the model predicts that leverage is lower for more profitable firms when investment is fixed (Jang, 2011; Jang and Park, 2011). Given profitability, leverage is higher for firms with more investments. Yet in a more complex view offered by Myers (1984), firms are concerned with future as well as current financing costs. Balancing current and future costs, it is possible for firms with large potential investments to maintain a low-risk debt capacity in order to avoid either foregoing future investments or financing them with risky new securities. Thus, controlling for other effects, firms with larger potential investments have less current leverage. Based on the asymmetric information theory Ross (1977) proposed the signaling effect. According to Ross (1977), market participants interpret high levels of debt as a signal of high quality and future cash flows for the firm. This implies that low quality firms cannot handle larger debt levels due to the higher likelihood of bankruptcy (Barclay et al., 1995). Consequently, the signaling effect restricts firms' access to equity markets because issuing new equity is perceived as a negative signal to market participants. Finally, in the agency models of Jensen and Meckling (1976(and Jensen (1986), there is a conflict between managers and stockholders. The interests of managers are not aligned with those of investors. Managers tend to waste free cash flow on perquisites. As Jensen (1986) argued, the greater the discretionary amount available to a manager, the greater the likelihood that the manager will use it for perquisites. This means that managers have a propensity to expand the scale of their firms, even if that behavior means undertaking poor projects or reducing firm value. This is referred to as an over-investment problem. To mitigate over-investment problems, a manager's ability to promote their interests is constrained by the availability of free cash flows. This constraint can be tightened even further through debt financing. Consequently, agency problems might be optimally solved through a capital structure decision, such as increasing debt leverage. Thus,

H_1: Capital structure has a positive relationship with the firm's performance.

Free cash flow and firm performance: Although the first complete study regarding the agency theory was conducted by Jensen and Meckling, yet the idea of FCF was originally proposed by Jensen, in which FCF is defined as net cash flows after deducting the needs of positive NPV projects. Since FCF is financial resources at the management's discretion to allocate, it is also called idle cash flows. Jensen argued that too much FCF would result in internal insufficiency and the waste of corporate resources, thus leading to agency costs as a burden of stockholder's wealth. Jensen empirically examined the agency problem and thus asserted that FCF was accused of the main reason why the investment return in the US companies fell below the required rate of return in 1980s.

In additional to FCF, Jensen argued that the self-interest motive of management was an important factor leading to agency costs. This was especially obvious when stockholder's and management's interests were in conflict, and consequently stockholder's interest was always dominated by management's. Brush *et al.* asserted that weak corporate governance caused the inefficiency in the allocation of free cash flows since the corporate board of directors was directed at the policies in favor of management's interest at the expense of stockholder's wealth.

The FCF hypothesis states that when a company has generated an excessive surplus of FCF and there are not profitable investment opportunities available, management tends to abuse the FCF in hands so as to resulting in an increase in agency costs, inefficient resource allocation, and wrongful investment. Brush *et al.*found that sales growth was most beneficial to companies being lack of cash flows, but not necessarily to companies with sufficient FCF and thus supported the FCF hypothesis. Chung *et al.* also found that excessive FCF might have a negative impact on corporate profitability and stock valuation and thus suggested the control hypothesis of institutional investors.

Not all empirical evidence supported the FCF hypothesis. For instance, Gregory examined how FCF influences merger performance based on the UK data and found that mergers with a higher level of FCF would perform better than those with a lower FCF level as evidence invalidating the FCF hypothesis. In addition, the studies conducted by Szewcyzk, Tsetsekos, and Zantout and Chang, Chen, Hsing, and Huang discovered empirical evidence in support of the investment opportunity

hypothesis that investors would most favor companies with both substantial FCF and profitable investment opportunities in stock valuation. Therefore

H_2: FCF has a Negative relationship with the firm's performance.

Diversification

Definition of Diversification: The concept of diversification is yet to be clearly defined and there is no consensus on its definition among researchers. Definitions of diversification are many. What is needed, therefore, is a comprehensive definition which is both theoretically valid and managerially meaningful. Booz, Allen and Hamilton (1985) have defined diversification as "a means of spreading the base of a business." Ramanujam and Varadarajan (1989) define diversity as "the extent to which firms are simultaneously active in many different businesses." These two definitions are consistent and reflect the views of theoreticians and practitioners. To elaborate, a firm can spread its base in two ways; (1) it can 'increase the number of segments in which to operate or (2) it can redistribute its businesses among the existing number of segments to become more diversified, the "extent" which Ramanujam and Varadarajan alluded to. In fact this is what managers do after deciding on the type of diversification; they determine the number of segments and the distribution among those segments. They do not directly manipulate total diversification of the firm. It is a result of their decisions on the two components. Thus, level of diversification is a two-dimensional construct, the two dimensions being the number of businesses and the distribution among the businesses. Further, diversification could either be related or unrelated in terms of the direction. Whichever type of diversification-related or unrelated-a firm adopts, what matters is how the spread of the business base is managed in terms of the number of segments and the distribution of the resources across those segments**(**RAGHUNATHAN, 1995).

Diversification and firm performance: The impact of diversification on firm performance is mixed. Three recent reviewers (Datta, Rajagopalan and Rasheed 1991, Hoskisson and Hitt 1990, Kerin, Mahajan and Varadarajan 1990), broadly conclude: (a) the empirical evidence is inconclusive; (b) models, perspectives and results differ based on the disciplinary perspective chosen by the researcher; and © the relationship between diversification and performance is complex and is affected by intervening and contingent variables such as related versus unrelated diversification, type of relatedness, the capability of top managers, industry structure, and the mode of diversification.

Some studies claim diversifying into related product-markets produces higher returns than diversifying into unrelated product-markets and less diversified firms perform better than highly diversified firms (Christensen and Montgomery 1981, Keats 1990, Michel and Shaked 1984, Rumelt 1974, 1982, 1986). Some claim that the economies in integrating operations and core skills obtained in related diversification outweigh the costs of internal capital markets and the smaller variances in sales revenues generated by unrelated diversification (see Datta, Rajagopalan & Rasheed 1991). While agreeing that related strategy is better than unrelated, Prahalad and Bettis(1986) ,clarify that it is the insight and the vision of the top managers in choosing the right strategy (how much and what kind of relatedness), rather than diversification per se, which is the key to successful diversification.

Accordingly, it is not product-market diversity but the strategic logic that managers use that links firm diversification to performance; which implies that diversified firms without such logic may not perform as well. Markides and Williamson (1994) show that strategic relatedness is superior to market relatedness in predicting when related diversifiers outperform unrelated ones. Others however argue, it is not management conduct so much, but industry structure that governs firm performance (Christensen and Montgomery 1981, Montgomery 1985).Besides diversification types and industry structure, researchers have also looked at the ways firms diversify. Simmonds (1990) examined the combined effects of breadth (related vs. unrelated) and mode (internal R & D versus Mergers & Acquisitions) and found that relatedly diversified firms are better performers than unrelatedly diversified firms, and R & D based product development is better than mergers and acquisition-led diversification (Simmonds ,1990Lamont and Anderson 1985). Among studies of acquisitions the results are mixed. Some report that related acquisitions are better performers than unrelated ones (Kusewitt 1985), or there is no real difference among them (Montgomery and Singh 1984).

Some studies on breadth and performance find relatedly diversified firms perform better than firms that are unrelatedly diversified (Rumelt 1974, 1982, 1986). Others show confounding effects in firm performance because of diversification category and industry (Christiansen and Montgomery 1981, Montgomery 1985). Recent studies suggest service firms should not diversify (Normann 1984), whereas, Nayyar (1993) shows that in the service industry diversification based on information asymmetry is positively associated with performance, whereas diversification based on economies of scope is negatively associated with performance. A contradiction of Johnson and Thomas' (1987) confirmation of Rumelt's finding that the appropriateness of product diversity is judged by a balance between economies of scope and diseconomies of scale. It also appears there is a limit on how much a firm can diversify; if a firm goes beyond this point its market value suffers and reduction in diversification by refocusing is associated with value creation (Markides 1992), (Pandya & rao, 1988, pp. 68-69). Therefore,

H_3: related diversification has a positive relationship with the firm's performance.

H_4: unrelated diversification has a positive relationship with the firm's performance.

MATERIAL AND METHODS

Data Collection

In this research we use a sample of 220 firms from the Iranian listed firms that active in the 21 industry from 2006-2011 (6 years) obtained from Tehran stock exchange information database. The sample that we use includes the following features:

1)The End of fiscal year of sample firms is 20th march.
2) Data for this firms are available,
3) are not from financial firms
4) Must be listed in Tehran Exchange before 2006 year.
5)Our final sample includes 128 firms.

The model and measurements of the independent and dependent variables are as follows:

(1) $$FP_{it} = \beta_0 + \beta_1 CP_{it} + \beta_2 RD_{it} + \beta_3 UD_{it} + \beta_4 FCF_{it} + \varepsilon_{it}$$

Where:

FP_{it}= firm performance for ith firm in t^{th} year.
CP_{it}= Capital structure for ith firm in t^{th} year.
RD_{it}= Related diversification ith firm in t^{th} year.
UD_{it}= Unrelated diversification ith firm in t^{th} year.
FCF_{it}= free Cash Flow ith firm in t^{th} year.
ε_{it} =is the error term.

Capital structure: In the present study to examine the capital structure**,** we used ratio of total debts to total assets, (Sajjadi et al, 2011).

(2) $$FL = \frac{TD_{it}}{TA_{it}}$$

Free Cash flow

Len and Pulson model (1989) is applied for measuring free cash flows. According to this model free cash flow is calculated by deducting total of taxes, interest cost and

Dividend from operating income before depreciation and standardized by dividing it to assets as following:

(3) $$FCF_{it} = (INC_{it} - TAX_{it} - INTEP_{it} - \mathbf{PSDIV}_{it} - CSDIV_{it})/A_{i,t-1}$$

Where:

$FCF_{i,t}$: is FCF of firm (i) at year (t)
$INC_{i,t}$: is operating income after depreciation of firm (i) at year (t)
$TAX_{i,t}$: is total taxes of firm (i) at year (t)
$INTEP_{i,t}$: is interest expense of firm (i) at year (t)
$PSDIV_{i,t}$: is preferred stock holders' dividends of firm (i) in year (t)
$CSDIV_{i,t}$: is common stock holders' dividends of firm (i) in year (t)
$A_{i,\,t-1}$: is total assets carrying value of firm (i) in year (t-1)

Related diversification: Related diversification score measures the extent of diversification within industries given the level of diversification at the industry level.

Related Scale (RD Scale) =

(1) $$\mathbf{RD_{sco}} = \left\{\left[\sum_{j=1}^{M} P_j \sum_{i=1}^{N} \left(\frac{P_{ij}}{P_j}\right) Ln\left(\frac{P_j}{P_{ij}}\right)\right] / \left[\sum_{j=1}^{M} (P_j Ln N_j)\right]\right\} \frac{\sum_{j=1}^{M} N_j}{M}$$

Unrelated diversification

(2) Unrelated Scale (UD Scale) = $$\mathbf{UD_{sco}} = \left[\sum_{j=1}^{M} \left(P_j Ln\left(\frac{1}{P_j}\right)\right) / LnM\right] M$$

Where:

$RD_{Sco=}$ **Related diversification**
$UD_{sco=}$ **Unrelated diversification**
P_{ij} = proportion of firm's total operations within the i^{th} business of the j^{th} industry.
P_j = proportion of firms operations within industry.
M = total number of industries (Separate ISIC two-digit code).
N = total number of businesses (Separate ISIC for-digit code).
N_j = total number of businesses within j^{th} industry (SANKARANP.RAGHUNATHAN, 1995).

RESULTS

Testing for Pool ability

In this section we use the chow test (F Leamer) to choose the estimation model of our research. This test assumes that:

1**.** $U1t \sim N$ (0, σ2) and $u2t \sim N$ (0, σ2). That is, the error terms in the sub period regressions are normally distributed with the same (homoscedastic) variance σ2.

2**.** The two error terms $\boldsymbol{u}1t$ and $\boldsymbol{u}2t$ are independently distributed (Gujarati, 2004, p 275-276)**.** In this test the null hypothesis refers to pooling data and the H_1 based on panel data. If p-value>.o5 we must be use the pooling data but, if p-value <.05 we use the panel data model to analyze the data. Thus, we use the ordinary least square (OLS) estimator for estimate the model of research. The table 2 shows results of chow test.

Table 1. Chow test (F leamer)

Chow test (F-Leamer)			
Redundant Fixed Effects Tests			
Pool: Sample			
Test cross-section fixed effects			
Effects Test	Statistic	df	Prob.
Cross-section F	0.00000	4.4096	1.000
Cross-section Chi-square	0.00000	4	1.000

Thus, According to results of the chow test in 1 table, we conclude that our data is pooling data.

Heteroscedasticity test

One of the important assumptions of the classical linear regression model is that the variance of each disturbance term *ui*, conditional on the chosen values of the explanatory variables, is some constant number equal to σ2. This is the assumption of homoscedasticity, or *equal* (homo) *spread* (scedasticity), that is, *equal variance*.

$$E(u_i^2) = \sigma^2 \qquad \text{i= 1, 2, …, N}$$

In this test the null hypothesis is there is no Heteroscedasticity and H_1 Implies that there is Heteroscedasticity in the each disturbance term *ui.* We use the Arch test to test Heteroscedasticity. The results of the Arch test shows in the 2 Table.

Table 2. Heteroscedasticity test

Heteroscedasticity Test: Arch			
F-statistic	2.675754	Prob. F(2.814)	0.0695
Obs*R-squared	5.336149	Prob. Chi-Square(2)	0.0694

The result of Table 2 shows that p-value of Arch test is more than .05 and it is implies that there is no Heteroscedasticity. Thus, the OLS estimator will be best linear unbiased estimator, takes such information into account explicitly and is therefore capable of producing estimators that are BLUE (Gujarati, 2004, p, 395). Because our data type was pooling, pooling least square estimator (PLS) used for fitting the model of research.

Also, because the Durbin Watson statistic is 1.555837 and it's located between 1.5 and 2.5, implies that there is no autocorrelation in residual sentences.

REGRESSION TEST AND CONCLUSION

We study the relation between capital structure, FCF, RD, UD and firm performance base on the variables in the section 3. We use Chow test determine the type of data whether data is pooling or panel data and we found that our data is pool. Thin, we use the Arch test to Heteroscedasticity test. According to the results of these tests we use the PLS regression model to hypotheses test. The results of the PLS regression model show in table 3.

The result shows that capital structure (financial leverage) has a significant and positive effect on firm performance (dependent variable) because p-value<0.05 and equal with 0.0000 and **t** statistic is 30.89717 and is not between 1.96 >**t**>-1.96 implies that two variables are not independent together, and this is in line with findings of Park & Jung (2013). This indicates that firms with higher leverage and financing from outside, has a better performance than other firms.

Table 3. PLS regression model results

Dependent Variable: Tobin's- Q (firm performance)				
Method: Pooled Least Squares				
Sample(adjusted): **2 822**				
Cross-sections included**:5**				
Included observations**: 821after adjustments**				
Total Pool (balanced) observations:**4105**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Capital structure	0.707136	0.022887	30.89717	0.0000
FCF	-4.30E-08	1.50E-08	2.873349	0.0041
RD	59534.31	5421.943	10.98026	0.0000
UD	1.30E-11	1.77E-12	7.361012	0.0000
R-squared	-0.033368	Mean dependent var	0.440020	
Adjusted R-squared	-0.034124	S.D. dependent var	0.698653	
S.E. of regression	0.070473	Akaike info criterion	2.155203	
Sum squared resid	2070.071	Schwarz criterion	2.161361	
Log likelihood	-4419.554	Hannan-Quinn criter.	2.157383	
F-statistic	12.868	Durbin-Watson stat	1.555837	
Prob. F	0.0000			

In hypothesis 2 test, since p-value is 0.0041<0.05 and t is 2.873349, this is indicate that FCF has a significant and positive effect on firm performance, this result is same as with findings of Park & Jung (2013) and Jensen & Mackling (1976).

In test the relationship between the Related diversification and firm performance, the result shows that p-value equal 0.000 and t = 10.98026 and indicate that Related diversification has a significant and positive effect on firm performance and this is consistent with the findings of Park & Jung (2013). This is implies that firms with higher level of Related diversification led to higher firms performance.

In the 4th hypothesis we test the relationship between Unrelated diversification and firm performance, the result shows (p-value=0.0000<0.05 and t statistic is 7.361012) that Unrelated diversification has a significant and positive effect on firm performance.

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