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Does Working Capital Management Play Mediating Role? Determinants of Capital Structure

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Abstract

The mediating effect of working capital is studied on the determinants of capital structure. This study is conducted in Pakistan on the sample of non-financial companies from 2010-2015. The panel regression is applied in three ways: firstly the pooled regression is applied; secondly the fixed effects model and finally the random effects model are applied. The results address that working capital play significant role between the capital structure and its determinants. With the inclusion of working capital as mediator the determinants like size, financial performance, mass and tangibility have become significant determinants of financial leverage.

Keywords: Mediating effect, Bankruptcy, working capital, determinants of capital structure, Hausman test, panel regression, random model.

Introduction

The excessive literature has tried to find the determinants of capital structure but the mediating effect of working capital has not been studied yet. Bankruptcy is the outcome of poor working capital management that is why the working capital management has to play a mediating role. On the other hand the best fit capital structure cannot be beneficial until it is supported by working capital management (Al-Najjar & Hussainey, 2011). Capital structure is the mix of debt and equity financing (Horne & John M. Wachowicz, 2008) but this mix cannot play a significant role until it has been properly supported by efficient working capital management.

It has always been a debatable issue, to find the optimal capital structure (Abor, 2005) and therefore the role of working capital as a mediator is very crucial for any company. The capital structure in any company is developed with the composition of short-term debt, long-term debt, and equity (Awan & Amin, 2014). The optimal capital structure will lead to maximize the firm value (Groen, 2016) but it cannot be achieved if it is not supported by better governance and effective working capital.

Corporations are collectively acts as the indicator of economic growth (Tachiwou, 2010). Stock market is the source through which the interest showed by investors by buying and selling the shares of listed companies (Aamir Ali & Aamir, 2014). So if the working capital has been management efficiently by the managers then the firm value will increase. The increase in firm value means increase in industrialization and economic growth. So finally it is very important to study the mediating role of working capital on determinants of capital structure.

This study uses the dataset of non-financial listed companies for econometric experiment. Pakistan has been facing political instability since 2000 many firms have gone bankrupt. The sample includes sectors like Paperboard, Fast Moving Consumer Goods (FMCG), Fuel and Energy, and

Coke and Refined Petroleum Products (SBP, 2017). The above industries do not face major bankruptcy. The sales pattern from 2010-2015, Kot addu, Nestle, Attock refinery, National Refinery and Pakistan Petroleum have sales around Rs. 200,000,000 but Pakistan State Oil had scored highest sales in during 2010-2015, which is from Rs. 800,000,000 - Rs.1, 200,000,000. The literatures predict a positive relationship between capital structure and working capital ratio (Frank & Goyal, 2003). But the mediating impact of working capital is still not studied.

Literature has not studied the mediating effect of working capital therefore this gap will be a novel attempt in the body of the knowledge. Many studies tried to find the determinants of capital structure but no study has ever tried to test the mediating effect of working capital management. So this is the initial attempt in Pakistan to test the mediation effect of working capital management on the determinants of capital structure. The sample of 16 profitable companies has been considered for a period of six years from 2010-2015. There are total 96 observations upon which the econometric model is tested.

The research question is, "Can working capital has a significant mediating influence on determinants of capital structure"? Therefore the objective of this research is to find out the mediating impact of working capital on the determinants of the capital structures. The hypothesis of this study to test that working capital has a significant mediating impact on determinants of capital structure.

Literature review

The Pecking Order principle (POT) states that the corporations would continually apply its internal financing to generate profits and does no longer contain debt in their capital structure (Noor, 2015). Internal financing is preferred on external financing (Ahmad & Ali, 2017). If the running and working capital is managed properly then the company can be capable of generate extra internal financing and cannot rent debt financing. POT requires the management to rely on internal financing and encourages the management to manage the working capital efficiently and effectively. On the other hand agency cost emerges when the company chief and directors don't claim the firm totally (Hadi & Suryanto, 2017). Agency fuction urges and requests chiefs to expand gainfulness of the firm (Jensen & Meckling, 1976). Normally the huge firms are the great markers of productive firm value (Fama, 1980). On the off chance that the directors are working appropriately, they are intended to oversee working capital productively and adequately. This will bring about producing more benefits by utilizing best fit capital structure for the organization. At last all endeavors will result in augmentation in investors' riches.

The capital structure has significant impact on firm performance (Muritala, 2018) but this cannot be possible without effective management of working capital management. Determinants like firm size, firm performance and macroeconomics factors play significant role in the mixture of capital structure (Öztekin, 2015) but how can the literature keep ignoring to study the mediating impact of working capital on the determinants of capital structure. The literature keeps on testing different theories to stream line the statements of theories of capital structure (Alipour, Mohammadi, & Derakhshan, 2015) but there is no theory which can claim the mediating impact of working capital management on the determinants of capital structure. Similarly the theories like pecking order and trade off theories have been tested in India (Chadha & Sharma, 2015) in manufacturing sector but the mediating effect of working capital has been totally ignored.

The impact of crisis on capital structure has been tested in France (Van Hoang, Gurău, & Seran, 2018) but again the role of working capital structure has been ignored. In fact the role of working capital management has to be considered while studying the determinants of capital structure. The working capital plays significant role in increasing the financial performance of the firm (Gonçalves, Gaio, & Robles, 2018).

Methodology

The determinants of capital structure are taken as independent variables in this proposition. Then the financial leverage has been taken as dependent variable. Finally I use working capital administration as intervening factors in this investigation. This segment will talk about the decision of legitimate experimental model, which should ready to give best fit determinants of capital structure.

The data for empirical analysis is comprised of 6 years data in this study which starts from 2010 and ends at 2015. In this study the explanations behind choosing the time of previously mentioned 6 years is the information identified with Pakistan till 2015 have been gone along by state bank of Pakistan (State Bank of Pakistan, 2017). For data analysis the Stata 12 software has been used and Structural Modeling Equation (SEM) has been used to check the mediation results.

$$FL_{it} = \beta_1 + \beta_2 SIZE_{it} + \beta_3 FP_{it} + \beta_4 MASS_{it} + \beta_5 TANG_{it} + \beta_6 FV_{it} + \mu_{it}$$

Here FL is financial leverage, measured as debt to equity ratio, used as dependent variable in the study. On the other hand independent variables include SIZE, the size of the firm measured as natural logarithm of sales, FP, the firm performance measured as return on equity, MASS, the mass of the firm measured as natural logarithm of total assets, TANG, the tangibility measured as natural logarithm of fixed assets and FV, the firm value measured as earnings per share. Whereas all $\beta_{2\text{-}6}$ are the coefficients of the independent variables and β_1 is used as constant and finally μ is used for error term. As this model is based on panel data therefore the $_I$ is used for firm and $_t$ is used for time period.

$$FL_{it} = \beta_1 + \beta_2 SIZE_{it} + \beta_3 FP_{it} + \beta_4 MASS_{it} + \beta_5 TANG_{it} + \beta_6 FV_{it} + \beta_7 WM_{it} + \mu_{it}$$

This model included WM as working capital management as mediator in the model. It is measured as working capital divided by total assets.

Results and discussions

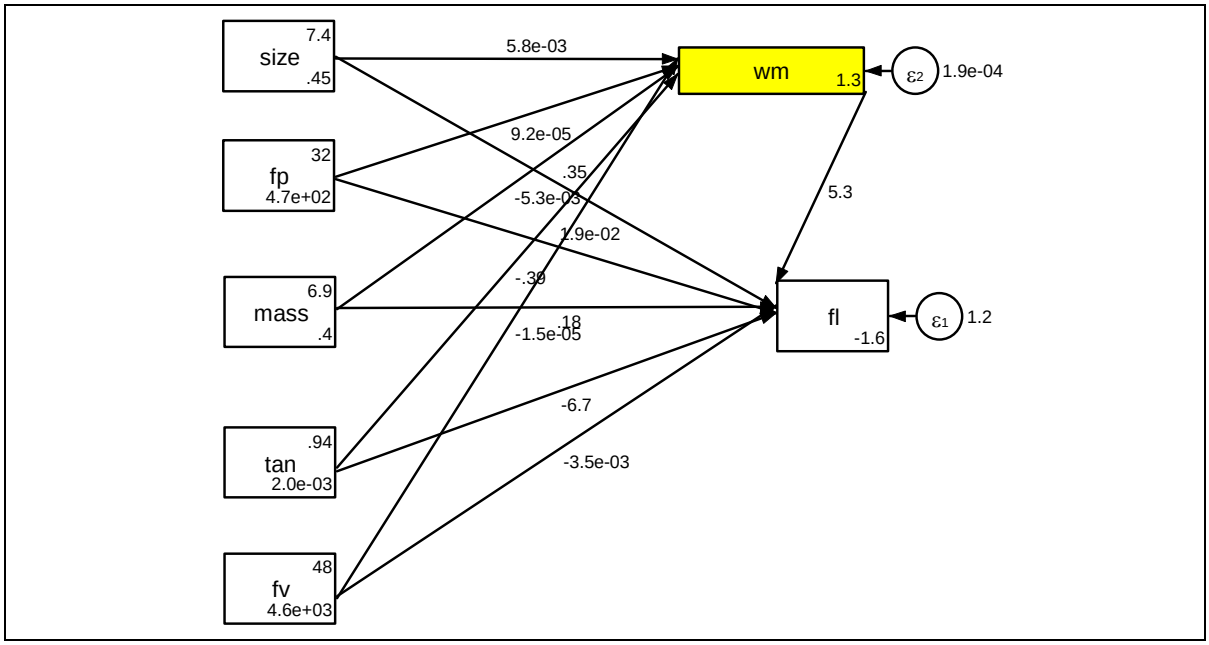

Figure 1 Results of SEM in Stata 12

Table 1 shows the results of SEM. The model describes that in the absence of mediator the size is the positive determinant of working capital but the result is insignificant as the p-value of the coefficient is not less than 0.05. Similarly the financial performance of the firm is also an insignificant determinant but has positive impact on working capital.

Table 1 Detailed results of SEM in Stata 12

Variables	coefficient	z-statistics	p-value
wm as dependent			
Independent variables			
Size	0.0057	0.85	0.397
Fp	0.0000919	1.16	0.245
Tan	-0.3922	-4.08***	0.000
Fv	-0.00015	-0.59	0.556
Mass	-0.0052	-0.76	0.446
Constant	1.32	14.15***	0.000
Fl as dependent variable			
Independent variables			
Wm	5.31	0.67	0.503
Size	0.34	0.65	0.514
Fp	0.019	3.08***	0.002
Tan	-6.65	-0.82	0.411
Fv	-0.0034	-1.75*	0.080
Mass	0.17	0.33	0.739
constant	1.58	-0.12	0.901

But tangibility has negative impact on working capital and this variable is significant determinant of working capital as the p-value is 0.000. It means that this variable is significant at 1 percent level of significance. On the other hand firm value is also insignificant at 5 percent level of significance and firm value also has negative impact on working capital. The mass of the firm is also having negative impact on working capital and the result is insignificant. Now the constant is 1.321 and the p-value is highly significant at 1 percent level of significance.

Table 2 Fixed effects panel regression results in Stata 12

Variables	coefficient	z-statistics	p-value
Fl as dependent variable			
Independent variables			
Size	-1.95	-2.32**	0.023
Fp	0.010	2.14**	0.036
Fv	-0.0016	-0.51	0.611
Mass	3.11	3.09***	0.003
Tan	-34.65	-4.10***	0.000
constant	26.73	3.81***	0.000

Table 1 also shows the results of determinants after mediating effect. Now the working capital management has been considered as mediating variable and the results have become changed. Now financial perfromance has become positive determinant of the financial leverage and the coef-

ficient is highly significant at 1 percent level as the p-value of this variable is 0.002. The firm value has also become significant determinant after mediation of working capital management. The firm value has negative impact on financial leverage and the p-value is 0.080 so the result is significant at 10 percent level of significance.

Table 2 also shows the results of determinants based on fixed effects model without mediator. Now the size has been considered as negative determinant with significant p-value. Now financial perfromance has become positive determinant of the financial leverage and the coefficient is highly significant at 5 percent level. The firm value has also become insignificant determinant. The mass has positive impact on financial leverage and the p-value is significant at 5 percent. Tangibility also has negative impact on financial leverage and the p-value is significant at 5 percent.

Table 3 Random effects panel regression results in Stata 12

Variables	coefficient	z-statistics	p-value
Fl as dependent variable			
Independent variables			
Size	-0.923	-1.51	0.131
Fp	0.0098	2.13**	0.033
Fv	-0.00055	-0.22	0.827
Mass	1.79	2.50**	0.012
Tan	-24.86	-3.81***	0.000
constant	19.01	3.34***	0.001

Table 3 also shows the results of determinants based on random effects model without mediator. Again the size has been considered as negative determinant with insignificant p-value. As compared to fixed effects model financial performance has become the positive determinant of the financial leverage and the coefficient is highly significant at 5 percent level. The firm value has also become an insignificant determinant. The mass has a positive impact on financial leverage and the p-value is significant at 5 percent same as fixed effects model. Tangibility also has a negative impact on financial leverage and the p-value is significant at 5 percent.

Table 4 Robust fixed effects model results

Variables	coefficient	z-statistics	p-value
Fl as dependent variable			
Independent variables			
Wm	-2.43	-0.35	0.725
Size	-1.93	-2.29**	0.025
Fp	0.01	2.15**	0.035
Fv	-0.0015	-0.49	0.627
Mass	3.13	3.08***	0.003
Tan	-35.33	4.06***	0.000
constant	29.44	2.83***	0.006

Table 4 shows the results of determinants based on robust fixed effects model with a mediator. The working capital management does not play a significant role but with this mediation affect the size has been considered as negative determinant with the significant p-value. The p-value

of the coefficient of size is 0.025. As similar to fixed effects model financial performance has become the positive determinant of the financial leverage and the coefficient is highly significant at 5 percent level. The p-value of the coefficient of financial performance is 0.035. The firm value has also become an insignificant determinant. The mass has a positive impact on financial leverage and the p-value is significant at 1 percent same as fixed effects model. Tangibility also has a negative impact on financial leverage and the p-value is significant at 1 percent.

Table 5 Robust random effects model results with a mediator

Variables	coefficient	z-statistics	p-value
Fl as dependent variable			
Independent variables			
Wm	-0.29	-0.05	0.964
Size	-0.96	-1.53	0.127
Fp	0.0098	2.12**	0.034
Fv	-0.00056	-0.22	0.824
Mass	1.844	2.52**	0.012
Tan	-25.31	-3.76***	0.000
constant	19.654	2.17**	0.030

Table 5 shows the results of determinants based on robust random effects model with a mediator. The working capital management does not play a significant role but with this mediation affect the size has been considered as negative determinant with the insignificant p-value. The p-value of the coefficient of size is 0.127. As similar to fixed effects model financial performance has become the positive determinant of the financial leverage and the coefficient is highly significant at 5 percent level. The p-value of the coefficient of financial performance is 0.034. The firm value has also become an insignificant determinant. The mass has a positive impact on financial leverage and the p-value is significant at 2 percent same as fixed effects model. Tangibility also has a negative impact on financial leverage and the p-value is significant at 1 percent.

Conclusions and limitations

It can be easily concluded that the working capital management plays a significant role as the mediator on the determinants of capital structure. But this study is based on profitable companies in Pakistan, the mediating role of working capital management must be revisited on the larger sample in order to develop a new theory and the upcoming researcher must be warned that they should not test anything on the capital structure without considering the mediating or moderating role of working capital management.

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