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RESEARCH PAPER

Significance of Internal Cash Flows on Investment of a Firm and Use of Cash Flow Sensitivity as Financial Constraints: A Panel Data Analysis

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PAPER INFO	ABSTRACT
	This paper tested the sensitivity of investment to the cash flow in non-financial (manufacturing and utility/service) companies listed at KSE from 2004 to 2011, using fixed effect model and GMM. Investment decisions in real assets of an organization are very crucial and are treated at the hub of an organization. Investments are financed by internal and external sources of financing. The internal source of financing is basically cash flows generated by a firm from its operations. The results reveal that the sensitivity is significantly higher for younger and low dividend payout companies. However, sensitivity with respect to size was not found significant, which means size of a firm has no impact on investment sensitivity due to its internal cash flows in Pakistan

Introduction

In corporate finance, a finance manager usually has to make two major types of financial decisions i.e. investment decisions and financing decisions. The investment or capital budgeting decisions, as usually called, are concerned with acquisition of real assets by a firm where as financing decisions consist of the ways these assets are to be financed. Investment in fixed capital is the most crucial element in growth and future viability of a firm. One can place it at the hub of the overall organization. It is however a volatile component in overall business activity.

In the neoclassical theory of firm investment, market value of a firm and investment provide adequate signals about future profitability. This fact is

represented by Tobin's q. However, the explanatory power of q is low and responsiveness of investment to fundamentals is found rather week. Moreover, various measures of internal funds mainly cash flow or profits have been found significant in explaining a firm's investment.

In perfect capital markets, the investment decisions of firms are said to be unaffected by their financing decisions (Modigliani and Miller (1958)).The investment models following the Keynesian revolution assume that firms respond equally to prices determined by the established capital markets. Other models view the cash flow as a major variable in determining the level of investment spending. The reason given by these theories is stated as the cost advantage of internal finance over external finance. When capital markets are not perfect, the firms facing higher market imperfections, relatively small in their size, young, and with low dividend pay-out ratio are found to face higher cost of capital viz-a-viz large and mature firms. Moreover, such firms are said to be referred as more financially constrained. In the presence of financial constraints, external financing may not be available easily. The investment of such a firm will have to depend on its internally generated cash flows for financing investment.

There are a lot of empirical researches on record and as given in the references wherein this sensitivity has been used to capture effect of financial constraints which the firms may face (Fazzari et al(1988), Hoshi et al (1991), Biddle et al (2006), Almeida et al (2007), and Beatty et al (2010)). This view is contradicted by many researchers on the issue. Zingale et al (1997), Cleary and some others are included in this school of thought. Contrary to Fazzari et al (1988), they argue that more sensitivity has been found in companies which are less constrained financially. Some other researchers on the issue are not ready to accept this investment sensitivity to represent financial constraints (Gomes (2001), Erickson et al (2000), Alti (2003), and Moyen(2004)). Still another point of view has been found in recent research wherein it has been argued that existence of the investment-cash flow sensitivity was used to represent of financial constraints but has declined with over the time. They further witnessed that this sensitivity has almost disappeared (Chen & Chen (2010).

The debate on this issue is of enduring nature and having extensive range in the literature which is still unresolved to a large extent and it remains a puzzle for the researchers. In this study, we have tried to ponder into the conflicting stance taken in various researches so for and to measure the sensitivity under debate in Pakistani companies while taking Tobin's q as control variable for investment opportunities. This method has been used in a large number of empirical researches in which the sensitivity has been measured by the coefficient of cash flow got from regressing investment on cash flow (Fazzari et al (1988), Moyen (2004)). We have further investigated the issue by segregating the sample firms into small and large firms, young and old firms, and those firms which paid no or low dividends.

According to the perfect capital market theory, the internal cash flow of a firm does not affect the firm's investment. Modigliani and Miller (1958) in their irrelevancy theory of capital structure, and static trade-off theories of financial behavior supported the similar view. In presence of perfect capital markets, the issue of the sensitivity of investment by a firm to its cash flow has not been an important subject of research since 1950s till mid 80s. All markets however are not always perfect due to taxes, transaction costs, asymmetric information or agency problems, so cost of internal funds and external funds have not been found equivalent. Due to such wedge between these costs, the issue of investment-cash flow sensitivity came under debate. According to Pecking order theory (POH) put forth by Myres and Majluf (1984), investment has a close relationship with the internal cash flows. Along with POH, Free Cash Flow theory (Jensen, 1986) also take into account market imperfections, and is concerned with over-investment by the managers, taking up non-value maximizing projects. The q theory **(**Tobin, 1969**),** where q is used for investment opportunities, also takes the investment sensitivity to a firm's cash flow as a proxy for financial constraints.

Literature Review

Various studies have been made to test the existence of the sensitivity of investment of a firm to its cash flows. In most of these studies, they have used Tobin's q for controlling the effect of investment opportunities (Fazzari et al (1988)). In these studies, the financial constraints faced by a firm are represented by their investment sensitivity to the internal cash flows. They posit that in case of financial constraints, external financing may not be available to such firms on equal footing and they will have will have to depend on internal funds. Keynes (1936) was also of the opinion that the access to capital markets did impinge on the liquidity of a firm as depicted by its balance sheet. If a firm is, however, financially unconstrained, then the corporate liquidity becomes irrelevant.

Fazzari et al (1988, 2000) were of the opinion that imperfect market information may create financing hierarchies regarding use of internal and external finances mainly due to tax considerations. They argued that investment is constrained by current cash flow. According to them, the investment sensitivity has been found greater in firms which are more financially constrained than unconstrained firms. Their results gave the empirical support to the point of those according to whom, capital markets are found to be imperfect and hence the existence of financing constraints thereof. Stephen Vogt (1994) appraised the significance of free cash flow (FCF) and pecking order (POH) theories using Tobin's q to test the significance of cash flow in explaining investment expenditure.

According to FCF hypothesis, the managers undertake even projects with negative net present value instead of distribution of excess cash to the stockholders and or repay their debts in the desire to empire building and sometimes to avoid negative signals in the market. POH assumes under-investment scenario, which is

due to liquidity constraints caused by asymmetric information. The impact of cash flow on capital expenditure has been observed higher in firms for which q-values are lower. It means that the capital spending financed by cash flow is marginally inefficient. His study also suggested that small firms which paid low dividends depended heavily on cash flow to fund their capital investment. The findings of Bond and Meghir (1994) were consistent with financial hierarchy approach (POH).They found that investment spending of a large proportion of the UK firms seemed to be affected by the internal cash flows. They further argued that financial constraints are important for a company's investment and this was found due to corporate taxes as well as personal taxes.

Gilchrist and Himmelberg (1995) found that Tobin's q had perhaps overstated the investment sensitivity to cash flow in unconstrained firms. On account of objections in various studies on the Tobin's q used for investment opportunities especially for financially unconstrained firms, previous studies relatively stated the difference in magnitude of cash flow effect on investment of the firms rather on lower side. According to them, firms having inadequate access to capital markets, the investments of firms with inadequate capital market access showed much higher sensitivity to fluctuations in cash flow.

Other studies especially carried out by Zingale et al (1997, 2000) furnished the opposite interpretation of the investment sensitivity to cash flow using also it as measure of financial constraints. They showed that firms which were not financially constrained depicted more investment-cash flow sensitivity. They gave empirical support to their argument by taking the sample of firms those selected by Fazzari et al (1988) as constrained and unconstrained firms. Chen and Ho, (1997) in their study, found their results according to investment opportunities hypothesis rejecting any explanatory power of free- cash- flow hypothesis. It implies that the availability or otherwise, of investment opportunities has its importance in appraising the corporate strategic investments like product strategies and capital expenditures while free cash flow was not. Cleary (1999) also followed the Kaplan and Zingale approach, and his study showed that investment decisions of the high creditworthiness firms depicted higher investment sensitivity to a firm's cash flows. Results of his study matched with those of Kaplan and Zingale (1997) i.e. the firms that were less constrained showed higher sensitivity to cash flow. These findings were opposite to that of Fazzari, et al (1988).

Zingale et al (2000) in their instant reply to the FHP (2000) criticism on KZ (1997) findings, once again supported their arguments that firms having more liquid assets depict more sensitivity to profitability shocks. They challenged that Fazzari et al (1988, 2000) and their proponents have not given adequate conditions for monotonicity. Almeida et al (2001) also supported the stance of Kaplan and Zingale (1997) and argued that less constrained firms borrow more, as they have more borrowing capacity and investment spending by such firms is witnessed more sensitive to cash flow shocks. According to them, sensitivities will decline

with financial constraints so long as firms are not fully unconstrained. Their study showed that if firms' credit quantity is affected by financial constraints, then one can think of taking investment sensitivity of a firm to its cash flow as a useful measure of financial constraints.

Carpenter and Guariglia (2003) took another proxy, contractual obligations of a firm to be fulfilled in case of ongoing future projects, along with q, and found after running the regression in the presence of both the proxies; the coefficient of cash flow declined in case of large firms while no change was witnessed regarding small firms. Hence, they argued that the cash flow has the effect on investment and can play effective role in reducing credit frictions. Moyen (2004) divided firms' sample into unconstrained and constrained categories on the basis of excess or no excess to external financial markets respectively. He used low dividends to identify financially constrained firms and his results matched with those of Fazzari, Hubbard and Petersen (1988) i.e. investment by low dividend firms shows more sensitivity to a firm's cash flow as compared to investment made by high-dividend firms. However, when constrained model was used, the results were more like that of Kaplan and Zingale.

Almeida et al (2004), used cash sensitivity of cash flow instead of investment sensitivity to measure financial constraints. They said that cash sensitivity is more appropriate as it has correlation with the ability of a firm to access capital markets. They witnessed that constrained firm's show higher cash sensitivity in situation when they tested it with respect to dividend payout policy, size of assets, ratings of bonds, nd commercial paper but not with respect to KZ (Kaplan and Zingales) index. At the same time period, Gugler, Mueller, and Yurtoglu (2004) showed that due to shortage of internal cash, some firms are unable to take up all of their proposed investments while some others make investments more than their fixed expenditure budget due the many reasons, mostly because of managerial discretion. If first issue is addressed any way, the second issue will prop up. The issues of asymmetric information as well as managerial discretion also term the validity of investment sensitivity to the cash flow as a puzzle.

Aggarwal and Zong (2005), however found that the firm's cash flows were positively related to the corporate investments in the capital market economies (UK & USA) as well as in bank centered economies (Germany & Japan). They argued that some firms have less access to external sources of finance and hence supported the pecking order theory of finance. They study showed strong evidence that with the increase of financial constraints, the investment sensitivity to a firm's cash flow also increases. They were of the view that internal finance was taken as preferred on the external finance. The study documented that there were significant differences of the sensitivities in economies where capital markets are very much developed and bank economies where more reliance for external finances is found on financial institutions including commercial bank. In the capital oriented economies, the response of financially unconstrained firms is

found lower than that by constrained firms. This shows that the unconstrained firms incurred higher monitoring as well as agency costs. Contrary to the capital market based economies, the investment sensitivity to cash flow in bank based economies were found high in financially unconstrained firms as compared to constrained firms.

There are still other researches which term the investment-cash flow sensitivity neither a necessary nor sufficient conditions for financial constraints (Gomes, 2001, Alti, 2003). According to Alti (2003), however, the investment sensitivity was higher for young, small, high growth and low dividend-pay-out firms. However, Agca and Mozumdar (2005) argued that the investment sensitivity to a firm's cash flows was on continuous decline over the time. They also found that the decline in the investment sensitivity was due to increased supply of funds in the market as well as institutional ownership especially financial institutions. They stated that investment sensitivity was found on the lower side in firms with average bond ratings. Their results showed that large firms showed higher sensitivities and higher payout firms witnessed greater sensitivities than firms having lower pay-out. Overall, they concluded that the investment sensitivity to cash flow reduces in the wake of reduction in market imperfections. Thus the capital market imperfections impose financial constraints and are evidenced by information contained in the issue of investment sensitivity.

Tsoukalas (2009) argued that cash flow may not be important only in imperfect capital markets but it can have its significance even in perfect capital markets, when future investment opportunities are fully taken care of. This study gave different line of thinking on the issue. By taking modified investment-q, their results witnessed that the investment sensitivities are not adequate framework to describe the capital market imperfections stance. Almeida and Campello (2007) extended his study by introducing another variable, asset tangibility and found that it increases the investment sensitivities to cash flows only for the firms, facing financial constrained while unconstrained firms were found unaffected. Hennessy and Whited (2007) found that the cost of external funds for all firms was not equal but large differences were found therein. Small firms seem to face large indirect cost of external finances as compared to large firms. They also showed that financing frictions were greater for low dividend firms, consistent with theories linked with adverse selection.

Recent studies go a step further and suggest that there is ongoing decline in investment sensitivity which has resulted ultimately into it's almost disappearance. However, they did not fully explain the reasons behind it (Chen and Chen (2011). They argued that the investment sensitivity has declined over the period and has disappeared in recent years. d. According to their opinion, the decline may be due to measurement error in Tobin's q or decline of informational content of cash flow about investment opportunities. However, they argued that

this decline was not due to changes in firm competition, corporate governance and/or changes in market power.

Keeping in view all of the above empirical findings, we are of the opinion that the issue under discussion is still unresolved and further research is needed to look into it so as the conflicting views can at least be sorted out and some common thread may be found to intertwine these different positions.

Material and Methods

This study has taken 107 corporate firms from all the non-financial sectors listed with the Karachi Stock Exchange from year 2004 to year 2010. The model we are going to use to estimate the investment sensitivity of a firm to its cash flows is the one followed by Fazzari et al (1988), Moyen (2004) and a number of other researchers:

$$I_{it}/K_{it-1} = \alpha_i + \alpha_t + \beta_1 * q_{it-1} + \beta_2 * CF_{it}/K_{it-1} + \mu_{it}$$

where Iit/Kit, is firm's fixed investment deflated by the firm's capital stock with one year lag., Kit-1(net property, plant and equipment), αi & αt are time series and cross sectional constants, β1 measures the investment–q sensitivity, qit-1 is Tobin's q with one year lag and β2 gives investment sensitivity to cash flow.

Data has been obtained from annual reports of the firms and balance sheet analysis file of non-financial firms prepared by State Bank of Pakistan as well as from KSE (Karachi Stock Exchange). The investment sensitivity is measured as undertaken by Fazzari et al(1988), taking cash flow as explanatory variable and Tobin's q as control variable to regress the investment in fixed assets using fixed effect panel model with weights and white cross section after checking hetero-skedasticity, and using houseman test. The analysis is made to investigate the presence of the investment sensitivity to cash flow and investment-q sensitivity in the sample firms. We have further tested the investment sensitivity with respect to size, dividend pay- out and age of a firm.

Hypothesis

H01: There is no investment sensitivity to the cash flow of a firm.

H02: Size does not affect the investment sensitivity to cash flow.

H03: Dividend does not affect the investment sensitivity to cash flow..

Ho4: Age does not affect the investment sensitivity to cash flow.

Results and Discussion

Table1
Summary Statistics

	INVD	CFI	TOBINQ	SIZEA	SIZEC	DIVI	AGE
Mean	1.360	0.598	7.113	10.418	11.055	0.191	33
Maximum	404.385	52.191	1372.500	603.997	23.703	23.703	75
Minimum	-0.998	-56.821	-458.780	0.051	0.013	0.000	4
Std Dev	19.570	3.773	88.110	48.243	88.446	1.043	15.95
Skewness	18.464	1.159	10.365	9.490	14.641	18.491	0.28
Kurtosis	351.389	167.041	1+-45.34	99.327	247.154	405.955	2.06

Table 2
Correlation Matrix

Variable	INVD	SIZEA	SIZEC	TOBINQ	CFI
INVD	1				
SIZEA	0.48	1			
SIZEC	0.36	0.41	1		
Tobin q	0.29	0.19	0.90	1	
CFI	0.48	0.36	0.15	0.23	1

There is positive correlation between investment and cash flow. The correlation between Tobin-q and investment is also positive but its magnitude is far less than that of cash flow. The correlation between size and investment is positive when book value of assets has been taken as proxy for size as well as when market capitalization is used as proxy for size of a firm.

First of all data was analyzed for Heteroskedasticity using White test. We used hausman test for the suitability of the method either fixed or random effect model. The test recommended for the fixed effect model.

The Investment sensitivity to cash flow of all sample firms has been found positively significant which means that investment in fixed assets depends upon internally generated funds. The investment sensitivity to cash flow is 1.78 as given in **Table-3.** This finding is according to the results found by Fazzari et al (1988) and their followers.

Table 3
Investment- Cash Flow Sensitivity in Sample firms
Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
C	0.2493	0.1343	1.8563	0.0640
CFI	1.7878	0.2132	8.3843	0.0000
TOBINQ	0.0059	0.0032	1.8396	0.0664

Adjusted R-Square: 0.66		Durbin –Watson: 2.04	
F-statistic:	12.66	Probability(F-statistic):	0.0000

Terms used: INVD=Investment;   CFI= Internal cash flow

Table 4
Investment- Cash flow Sensitivity with respect to size
Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
C	0.9149	0.1830	4.9989	0.0000
CFI	0.2854	0.0678	4.2102	0.0000
TOBINQ	0.0147	0.0101	1.4524	0.1470
DI	0.3417	0.2334	1.4638	0.1438
Adjusted R-Square: 0.093		Durbin –Watson:2.48		
F-statistic:1.60		Probability(F-statistic):0.0004		

D1*: Size dummy,* Terms used: INVD=Investment;   CFI= Internal cash flow

Table 5
Investment- Cash flow Sensitivity with respect to Dividend –payout Ratio
Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
C	0.7665	0.0819	9.3562	0.0000
CFI	0.9452	0.1809	5.2237	0.0000
TOBINQ	0.0328	0.0104	3.1586	0.0017
D2	-0.4124	0.1822	-2.2637	0.0240
Adjusted R-Square: 0.235		Durbin –Watson:2.39		
F-statistic:2.80		Probability(F-statistic):0.0000		

D2*: Dividend-payout dummy,* Terms used: INVD=Investment;CFI= Internal cash flow

Table 6
Investment- Cash flow Sensitivity with respect to size
Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
C	1.3189	0.1189	11.089	0.0000
CFI	0.5864	0.1642	3.5719	0.0004
TOBINQ	0.0032	0.0021	1.5256	0.1277
D3	-0.6861	0.1048	-6.5435	0.0000
Adjusted R-Square: 0.119		Durbin –Watson:2.64		
F-statistic: 1.79		Probability(F-statistic):0.0000		

D3*: Age dummy,* Terms used: INVD=Investment;   CFI= Internal cash flow

As per results reported in table-4, we found that in presence of size as a dummy variable, the hypothesis is accepted for size which means that investment sensitivity is not significantly affected by size of the firm. The coefficient of the cash flow has declined from 1.78 to just 0.285. This finding is inconsistent with the

results found by Fazzari et al (1988) as well as and others having similar point of view. It is however consistent with some of the studies including Chen et al (2010).

The results of investment sensitivity to cash flow with respect to no or low dividend paying firms and high dividend paying firms has been found negatively significant given as table-5. This means that the sensitivity is higher in low dividend firms to the extent of about 41%. This result is also according to the results of Fazzari et al (1988) and others in their camp. The results also show that the investment cash flow sensitivity with respect to age of the firms is negatively significant which means that young firms have higher investment cash flow sensitivity as compared to the old firms as given in table-6. The findings are according to the epirical evidence presented by Fazzari et al (1988).

This study also used generalized method of moments (GMM) to analyze our panel data of all the sample firms to see moments effect therein. This method has been reported to be efficient than other estimators in its class because of its minimal variance and can safely be applied in rather complicated situations. This method is applicable in heteroskedastic situations as well. It works with lagged values of all the variables. The results obtained through GMM are given in table-7 to table-10.

Table 7
Investment- Cash Flow Sensitivity in Sample firms

Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
INVD(-1)	-0.300280	0.011892	-25.25102	0.0000
CFI(-1)	-0.902614	0.057542	-15.68623	0.0000
TOBINQ(-1)	0.063282	0.003104	20.38736	0.0000
RESIDUAL	0.922503	0.001719	536.6924	0.0000
Adjusted R-Square: 0.919			J statistic : 10.23	

Terms used: INVD=Investment;   CFI= Internal cash flow

Table 8
Investment- Cash flow Sensitivity with respect to size

Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
INVD(-1)	-0.3024	0.0120	-25.1034	0.0000
CFI (-1)	-0.9102	0.0584	-15.5992	0.0000
TOBINQ(-1)	0.0636	0.0032	20.1942	0.0000
D1	-0.3592	0.0056	-63.6721	0.0000
Adjusted R-Square: 0.919			J statistics:10.32	

D1*: Size dummy,* Terms used: INVD=Investment;   CFI= Internal cash flow

Table 9
Investment- Cash flow Sensitivity with respect to Dividend –payout Ratio

Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
INVD(-1)	-0.1147	0.0223	-5.1472	0.0000
CFI(-1)	-0.6539	0.0397	-16.489	0.0000
TOBINQ(-1)	0.0723	0.0102	7.0782	0.0000
D2	-2.0994	0.1412	-14.869	0.0000
Adjusted R-Square: 0.633			J statistics:13.88	

D2*: Dividend-payout dummy,* INVD=Investment;   CFI= Internal cash flow

Table 10
Investment- Cash flow Sensitivity with respect to Age

Dependent Variable: INVD

Variable	Coefficient	Std. Error	t-statistic	P-value
INVD(-1)	-0.0026	0.0158	-0.1611	0.8721
CFI(-1)	-0.9642	0.0533	-18.082	0.0000
TOBINQ(-1)	-0.0112	0.0078	-1.4435	0.1496
D3	-8.8739	110.5997	-0.0802	0.9361
Adjusted R-Square: 0.724			J statistics: 12.40	

D3*: Age dummy,* Terms used: INVD=Investment;   CFI= Internal cash flow

As per theoretical background, the small firms in the growth phase, we mean comparatively young firms paying no or low dividends face financial constraints due to inadequate access to information about capital markets and lack of collateral required to be offered against external debt. They have to feed their investment from their internal funds. These firms face difficulty not only because of higher cost of debt but also due to lack of their reputation in the market. The creditors feel reservations to finance them in   the wake of credit risk perception. The prospective investors also rate such firms below their actual market worth. Hence cost of capital of such firms is relatively high, which make them financially constrained. In this perspective, we interpret the investment cash flow sensitivity as a measure of financial constraints.

Conclusion and Recommendations

The study has been made to investigate the debate on existence or disappearance of cash flow sensitivity for investment. The literature on this issue is found in abundance but the issue is still unresolved. We, in our study, found that cash flow sensitivity to investment exists in non-financial firms in the period 2004 to 2010. The belief and some empirical evidence (Chen, 2010) regarding disappearance of the sensitivity under consideration are not proved valid as such in our case. We also carried out our research to know about cash flow. It is evident from the large amount of literature that small firms, which are young, face difficulties in arranging the funds from external debt and equity market especially

in the wake of capital market imperfections. Such firms usually depend on internal funds to finance their investments. They can pay low dividends due to financial constraints. This view was first advanced by Fazzari et al (1988) wherein he argued that such firms are financially constrained and this financial constraint is represented by investment cash flow sensitivity.

This study witnessed that investment sensitivity to cash flow is higher in small and low paying dividends as compared to the old and high dividend-payout firms. However, the effect of size on the investment cash flow sensitivity has not been found significant. These results show the indication of capital market imperfections in Pakistan.

References

Agca, S. & Mozumdar, A. (2005). The Impact of Capital Market Imperfections on Investment-Cash Flow Sensitivity, *Journal of Banking and Finance*, Vol. 32, 207-216.

Aggarwal, R. & Zong , S. (2005). The Cash Flow-Investment Relationship: International Evidence Of Limited Access To External Finance. *Journal of Multinational Financial Management*, vol. 16, 89-104.

Almeida, H. and Campello, M. (2001). *Financial Constraints and Investment-Cash Flow Sensitivities: New Research Directions*. Paper presented at the University of Chicago, and the Western Finance Association meetings.

Almeida, H. Campello,M. &Weisbach, M.S. (2004). The Cash Flow Sensitivity of Cash, *The Journal of Finance*, vol.59, no.4, 1777-1804.

Almeida, H. Campello,M. (2007). Financial Constraints, Asset Tangibility, and Corporate Investment, *The Review of Financial Studies*, vol.20,no.5,1429-1460.

Alti, A. (2003). How sensitive is Investment to Cash Flow when Financing is Frictionless, *The Journal of Finance*, vol.58, no.2, 707-722.

Bond, S. & Meghir, C. 1994, Financial Constraints and Company Investment, *Financial Studies*, vol.15, no.2, 1-18.

Carpenter, R.E. & Guariglia, A. (2003). *Cash flow, Investment, and Investment Opportunities: New Tests using UK Panel Data*, Discussion papers in economics, University of Nottingham,UK.

Chen, S.-S. & Ho,K.W. (1997). Market Response to Product-Strategy and Capital Expenditure Announcements in Singapore: Investment Opportunities and Free Cash Flow, *Financial Management*, vol.26,82-88.

Chen, H.J. & Chen, S.J. (2011). Investment-Cash Flow Sensitivity Cannot be a Good Measure of Financial Constraints: Evidence from The Time Series. *Journal of Financial Economics*, vol. 103, 393-410.

Cleary, S. (1999). The Relationship Between Firm Investment and Financial Status, The *Journal of Finance*, vol.54, no.2,673-692.

Fazzari,S. Hubbard, R.G. & Petersen, B.C. (1987). *Financial Constraints and Corporate Investment*, NBER Working Paper# 2387, 1987, 1-40/Brookings papers on Economic Activity, 1988, 141-195.

Fazzari,S. Hubbard, R.G. & Petersen, B.C. (2000). Investment-cash flow sensitivities are useful. A comment on Kaplan and Zingale (1997), *The Quarterly Journal of Economics*, vol.115,695-706.

Gilchrist, S. &Himmelberg, C.P. (1995). Evidence on the Role of Cash Flow for Investment, *Journal of Monetary Economics*, Vol. 36, 541-572.

Gugler, K. Mueller,D.C. & Yurtoglu, B.B. (2004). Marginal q, Tobin's q, Cash Flow, Investment, *Southern Economic Journal*, vol.70 no.3, 512-531.

Hennessy, A. & Whited, T.M. (2007). How costly is External Financing? Evidence from a Structural Estimation, *The Journal of Finance*, Vol.62, no.4, 1705-1745.

Kaplan,s. N.& Zingales,L. (1997). Do investment cash-flow sensitivities provide useful measures of Financing constraints?, *The Quarterly Journal of Economics*, vol.112, 169-215.

Kaplan, s. N. and Zingales, L. (2000). Investment- cash flow sensitivities are not valid measures of financing constraints, The quarterly Journal of Economics, vol.115, 707-712.

Moyen, N. (2004). Investment-cash flow sensitivities: Constrained versus unconstrained firms, *The Journal of Finance*, vol.59, no.5, 2061-2092.

Tsoukalas, J.D. (2009). *Time to build capital: Revisiting Investment-cash Flow Sensitivities*, paper presented at seminar on September 22, 2009 at The Bank of England. 1-29.

Vogt, S. C. (1994). The Cash Flow/Investment Relationship: Evidence from U.S Manufacturing Firms, *Financial Management*, vol. 23, no.2, ,3-20.