INTERNAL FINANCIAL MARKETS AND CORPORATE INVESTMENT STRATEGIES IN AFRICA – A CASE STUDY OF MAURITIUS

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ABSTRACT. This Paper confirms that, in a pre-financial crisis environment, alternative forms of corporate arrangements and operation of internal financial markets impact differently on corporate investment decisions, tested in heterogeneous samples in Mauritius. Innovatively, a more rational measure of internal finance (net liquidity), in line with International Accounting Standards, is adopted. It is found that only certain categories of firms rely more on internal finance than others and also do not resort to debts. Based on the results available, several policies are proposed for the authorities and financial institutions in view of addressing the problem of financial constraints (FC) and enhancing corporate investments.

1. Background and motivation

The aim of this Paper is to investigate the extent to which corporate investment decisions are determined by the availability of internal finance in a pre-financial crisis period in Mauritius. Such a relationship has been extensively studied in several contexts for policy decisions, including Fazzari et al. (1988); Calem and Rizzo (1995); Cho (1995), Kaplan and Zingales (1997); Steinbuks, (2012); Ding et al. (2013), amongst others.

The relationship between corporate arrangements, notably corporate governance issues and firms' behaviour (e.g., investment and capital structure decisions) has interested a number of researchers over the preceding decades. By and large, it is found that firms which are organised in conglomerate structures operate internal financial markets to fund feasible projects. Thus, the availability of external sources of funding has apparently no impact on the investment decisions of such enterprises. Reliance of firms on internal funding is influenced by many other factors such as ownership structures, agency relationships, relationship banking, stock market listing, and international affiliations.

An analysis of the literature unveils that there currently exists a large body of studies examining the investment-cash flow relationship in countries like the U.S and U.K, in contrast with developing countries like Mauritius where no such results are available. The majority of existing studies have concentrated in different sub-samples of manufacturing firms with puzzling, inconsistent and sometimes confusing results. Many researchers have used simple methodology with the Q investment models, little robustness tests and sensitivity analysis conducted. Advanced and more robust econometric estimates are thus needed in a more dynamic context for better informed decisions from a policy perspective, both at the firms' levels as well as from the Authorities to increase the amount of financing available to companies.

For this Paper, a unique data set of Mauritian companies in different sectors in the banking, insurance, leasing, hotel, oil, retail/distributive trade and the construction industry is adopted.

For a deeper analysis, the full sample of firms is divided into several subsamples as follows: top 100 companies, firms in group-structure, those which are not in group structures, local firms, international firms, firms with good banking ties, those with good and poor corporate governance, listed and unlisted firms.

Innovatively, an improved measure of internal cash flow (net-liquidity), which comprises of cash flow, plus short-term liquid investments and any liquid asset for which there is a readily available market, in line with International Accounting Standards (IAS) 7, is adopted. It is argued that net-liquidity is a better measure of firms' cash positions. Various robustness tests have been conducted by estimating a range of investment econometric equations. The joint determination of internal and external factors in the determinants of private investment is also tested.

2. Organisation of paper

This Paper is organised as follows: Following the introduction in section 1.0, section 3.0 reviews the related theoretical and empirical literature regarding the use of internal finance in enterprises. Section 4.0 models the impact of internal liquidity on private investment behaviour, section 5.0 describes the data and variables used in this study while the methodology used is explained in section 6.0. The economic rationale for the use of an improved measure of internal liquidity is explained in section 7.0, followed by a sensitivity analysis and sample selection procedure in section 8.0 and the econometric results in section 9.0. Section 10.0 concludes the paper with some policy implications of this research.

3. Related Theoretical and Empirical Literature

Several theories relating to corporate capital structure decisions have been brought forward to explain why firms prefer to use internal financing to fund investments. It is observed that access to information by financial institutions and costly external finance coerce firms to rely on internal funds to finance investment projects, mainly caused by the problem of adverse selection and moral hazard. Firms are generally regarded as being financially constrained when they are pressed to use internal cash flow. Moreover, they become financially constrained when their actual investment spending exceeds the supply of available internal finance of the organisation. In such a situation, investment is seen to be dependent on cash flow and such a coefficient can be treated as a measure of financial constraint (FC) (see Fazzari, Hubbard and Petersen (FHP), 1988; Mizen and Vermuelen, 2006).

Due to FC, firms depending exclusively on external finance might not invest and forgo a profitable venture. The Pecking Order Hypothesis (POH) argues that the problem of information asymmetry creates a hierarchy of priorities in their financing strategies. For any new investments, they use retained earnings as a priority as the latter entail lower or no information asymmetry. After retained earnings, they resort to debts, followed by hybrid debts and then ultimately to equity financing, as they entail agency costs. Thus, internal financing is preferred to external financing.

Fazzari et al. (1988) (FHP) deduced that firms were financially constrained when they were compelled to resort to internal financing for investment projects. A firm was thus more financially constrained when its (I/CF) sensitivity was larger. Similar results were found by Hadlock (1998) for the US companies, Chapman et al. (1996) for Australian companies, Guariglia (2008) for the UK firms, Schaller (1993) for Canadian firms, Luzzi and Fagiolo (2006) for Italian firms, Lamont (1997) for US oil companies, amongst others.

Atkin and Glen (1992) surveyed macroeconomic data on the corporate sector in several developing economies (Zimbabwe, Pakistan, Malaysia, India and South Korea) and found that Zimbabwean and Pakistani firms relied most heavily on internal finance. However, South Korea had a more advanced financial system and firms made greater use of external financing. Cobham and Subramaniam (1998), in an Indian study, used a sample of larger firms and found that

Indian firms used substantially lower external and equity financing. Mayer (1988) reported results for France, Japan, Germany, the UK and USA for the period 1970-85 where, regardless of whether market-based or bank-based capital structure was observed, retentions were the dominant source of finance for firms in the main industrial countries.

Using data from six OECD countries comprising of the United States, Canada, Germany, United Kingdom, France and Japan, Kadapakkam et al. (1998) concluded that there was indeed a significant relationship between investments and internal funds. Chatelain et al. (2003) found a more significant impact of internal finance on investment than in other European countries (excluding Germany).

Numerous studies have shown that some firms (new and unaffiliated) were more dependent on internal cash flow rather than mature and affiliated firms. These include, for example, Chirinko and Schaller (1995) who used a sample of 212 Colombian firms over the 1973-1986 periods. Some authors have equally tested the impact of corporate governance on investment. Shleifer and Wolfenzon (2002) & Lan and Wang (2004) found that firms with good corporate governance structures could mitigate moral hazard behaviour and therefore raise finance easily in the external capital market to fund investment.

Ding et al. (2013) used 12,000 Chinese firms to study the relationship between financial constraint, investment and working capital from the period 2000 to 2007. It was proved that internal financial constraints were measured by low cash flows and firms had to adjust their working capital in order to fund investment projects.

By classifying firms according to group structure and independent ones, Hoshi et al. (1991) found no relationship between investment and liquidity. Contrary results to FHP were found, since the classification scheme used by FHP was unreliable. Chirinko and Kalckreuth (2002) found similar results by using a sample of firms having negative cash flows.

Kaplan and Zingales, KZ (1997) adopted a more reliable probabilistic model of FC for non-financial firms and found that financially constrained firms had weaker investment-cash flow sensitivity. Firms were classified based on quantitative and qualitative information obtained from company annual reports with the KZ index. This was mainly explained by the risk aversion of managers who did not want to make investment.

4. Modelling the influence of internal liquidity on private investment

This section models the impact of internal liquidity on private investment. The different investment models of Cho (1988) are augmented with the improved measure of liquidity. The model also includes a measure of debt of the firms, which measure the extent to which private investment depend on external financing. The model is as follows:

Augmented Dynamic form Accelerator model

$$
\begin{aligned}
[I_{it}/K_{i,t-1}] \;=\; & \rho[I_{i,t}-1/K_{i,t-2}] + \beta_0[Y_{it}/K_{i,t-1}] + \beta_1[Y_{it-1}/K_{i,t-2}] + \beta_2 DEBT_{it-1} + \\
& \beta_3 LIQUIDITY_{it-1} + \beta_4 FINDEV * LIQUIDITY_{it-1} + \\
& \beta_5 FINLIB * LIQUIDITY_{it-1} + \alpha_t + v_{it}
\end{aligned}
\tag{4.1}
$$

where I_{it} denotes gross investment, α_i is an unobserved company-specific effect, α_t is a time specific effect, v_{it} is an idiosyncratic shock, K_{it} is capital stock and Y_{it} denotes output level. t-1 implies one period lag while t-2 implies two periods lag. Such a model has also been used by FPH (1988). It is observed that investment mainly depends on the debt amount of the firm, its internal liquidity and capital. Two interactive terms, $FINDEV * LIQUIDITY_{it-1}$ and $FINLIB * LIQUIDITY_{it}$ are also included. These are to capture any form of interaction that may exist between financial liberalisation (FL) and liquidity and between financial sector development (FSD) and liquidity.

In the above equation, the following hypotheses are tested: the positive relationship between investment and current period investment levels; whether output of firms increases the amount

of investment needed; the relationship between corporate debt and investment levels (the literature has got mixed results but for this Paper, the tested hypothesis is whether corporate debts increases investment levels); a positive influence of FL and FSD on corporate investments. The hypothesis that the interaction between FL and FSD to increase investment levels is also tested.

5. DATA AND VARIABLES USED

Financial sector development is defined as the total amount of loans disbursed by banks over GDP. Since banks account for the highest percentage of loans given in the country, this measure of financial sector development is considered appropriate. Financial Liberalisation is a process for allowing the market forces determine prices such as interest rates. Since several elements explain the process of FL, the latter is captured through a single index of FL computed from the method of Principal Components (PC). This is a statistical technique used in order to capture several variables that explain a particular observation into a single index. Debt of firms is captured by the total liabilities of firms, which include both short term and long term

	Table 1: Definition of variables used in regressions
Variables	Indicators used
Financial Sector Development	Total bank credit over GDP
Financial Sector Liberalisation	Financial Liberalisation Index computed from the PC method
Output	Net Sales
Debts	Total liabilities of the firm
Investment	Increase in fixed tangible assets, net of disposals
Gross Operating Profit	Net earnings after taxes, interest payments, interest on fixed income securities, inclusive of depreciation charges
User Cost of Capital	The cost of capital services/rental price of capital is calculated from many variables like the price of investment goods, bank lending rate, more specifically changes in the price of capital goods. We follow Hobbel and Muller (1992) where User Cost of Capital is computed as follows $UCC = PK[r(1-t)+\delta-\pi^e]/P$, where PK is the price of capital goods, r is the bank lending rate represented by the Key Repo Rate, t represents the corporate tax rate, δ is the depreciation rate, π^e s the expected rate of change in capital goods price and P is the general price level.
Other Variables	Corporation tax rate of 15% used throughout. Inflation rate average 5%. Key Repo Rate 6.5%
Other Net Assets	Total assets minus fixed assets minus current liabilities
Depreciation	Decrease in the value of fixed assets, excluding disposals
	Source: Author

Data (e.g., sales, investments, profits, cash flow and depreciation) have been obtained from the financial statements of companies filed with the Registrar of Companies from 1994 to 2007 (pre-financial crisis period). Pertinent data have also been obtained from a publication on "the Top 100 Companies in Mauritius," where information on the top 100 companies as well as

another 237 runners up has been gathered. The Fact Book of the Stock Exchange of Mauritius (2007) contains important data for listed companies in Mauritius. The independent variables used are explained in table 1 below.

6. Methodology

The regressors and the error term in the above investment equation might be correlated, even after first differencing. Moreover, a two way causal relationship might exist between the explanatory variables. Hence, the GMM estimates (Arellano and Bover, 1991) would provide robust estimates and also allow us to control for unobserved (omitted) firm specific effects, which is constant over time (fixed effects). This follows a similar procedure of static panel data resembling an autoregressive model AR (1) equation with individual heterogeneity and exogenous regressors added. A related approach as followed by Cho (1995) is adopted and the first difference of the equations is taken to eliminate firm specific effects. Hence, lagged values of endogenous variables dated t-2 are used. The different diagnostic tests, viz Sargan test, Wald test, 1st and 2nd order autocorrelation tests are reported.

To be econometrically sound, for any year in which an important variable in the regressions had increased or decreased significantly, same has been removed from the sample. This resulted to an unbalanced sample of 298 firms.

7. Rationale for the use of a new measure of liquidity

As per International Accounting Standards (IAS) 7, which deals with the Statements of Cash Flows, the cash component available for operating activities is composed of both cash and cash equivalents. Cash implies money in the form of currency. Up till now, almost all researchers have used this measure of internal liquidity and have not considered the cash equivalents of firms. Cash equivalents are defined as short term, highly liquid investments that are readily convertible to known amount of cash and which are subject to insignificant risk in changes in value. Examples of cash equivalents include commercial papers, T-Bills, short term Government Bonds, marketable value of securities, money market holdings etc. As stated under paragraph 7 of IAS 7, cash equivalents are held for the purpose of meeting short term cash commitments rather than investments or other purposes.

Moreover, as per the International Financial Reporting Standards, the assets of firms need to be presented in a fair manner and which reflect the real worth of the business. IFRS 13 states that "when measuring fair value, the objective is to estimate the price at which an orderly transaction to sell an asset or to transfer a liability would take place between market participants at the measurement date under current market conditions". Hence, financial assets such as liquidity should be measured fairly.

Previous researchers have not accounted for real and fair value measurement of cash flow, which is used in this study. As such, an improved measure of internal cash flow (net-liquidity) is adopted, which comprises of cash flow plus short-term liquid investments and any liquid asset for which there is a readily available market and which could easily be sold without any risk within a time span of 3 months. Such information was available either on the face of the balance sheets or in the notes section of the accounts.

In the computation of corporate liquidity, short term liquid investment is also included. These investments should have a readily available market because firms can easily sell these liquid or quasi liquid investments and invest them in other profitable capital expenditure projects.

8. Sensitivity analysis and sample selection procedure

For the purpose of this study, the sample of 298 firms is used. This is further divided between the top 100 companies based on their turnover (proxy for size and strength) and other 198 companies (runners up). Also, a number of sensitivity is made. The existence of internal financial markets is tested in the following sectors: banks; insurance; hotels; manufacturing companies;

construction companies; leasing industries; retail/distributive trade and oil companies. Moreover, this study distinguishes between firms with good and poor corporate governance, those within a group structure and independent ones, international firms versus domestic firms, companies with a good banking relationship, those with poor liaisons and those with easier access to capital through the stock market.

For firms with access to stock market, these were 38 which were listed on the stock exchange of Mauritius. For information on corporate governance structures, the annual reports of companies indicate the number of directors on its board. A firm is classified as having a good corporate governance structure if it has more than 75% independent directors. Information on the corporate structure of firms are already available explicitly in their annual reports and could be classified into the following: group versus independent ones, domestic versus international firms. Normally firms in Mauritius have several sources of borrowings such as from family and friends, from banks, as well as borrowing from other institutions such as insurance companies and specific Government Funds. For this Paper, a firm is considered to have a strong banking relationship if it has a bank loan/total debt ratio exceeding or equals one. This implies that the firms have been able to credibly communicate themselves in the banking market in the past and thus have a higher proportion of loans from banks to other institutions/sources.

9. Econometric results

9.1. **Results from Sales-Accelerator model.** Table 2 reports results of the sales-accelerator model for the full sample of firms as well as those in different subsamples. The dependent variable throughout is corporate investment. Empirical results from regression 1 for the full sample of enterprises show that current investment is highly dependent on investment made in the previous period. This can be explained by the fact that companies conduct investment in a phased manner and as and when there are profitable ventures. In column 2, debt and liquidity are included as additional variable for the whole data set of 298 firms and find positive and significant effect of internal liquidity on company investment. Firms thus depend largely on internal financing to finance investment expenditures. The different diagnostics performed, notably the Sargan and Wald test confirm that the model is rightly specified and can be accepted, unless otherwise specified in the different analysis.

It is observed that the coefficient of debt is insignificant, implying that firms do not depend on debt to increase investment level, but rather internal liquidity when available, which has a significant and positive coefficient on corporate investment. Also incorporated, two important variables in the regressions: FINDEV*LIQ and FINLIB*LIQ where the former is the joint product of the overall financial development variable interacted with internal liquidity and the latter is the financial liberalization index interacted with internal liquidity.

Significant and positive coefficient on FINDEV*LIQ is observed, indicating that financial sector development, interacted with internal liquidity increases private investment. Firms thus make use of internal liquidity and also rely on financing from banking institutions as and when the latter is made available and accessible to them. Moreover, the coefficient on FINLIB*LIQ is positive and significant due to the positive impact of internal liquidity on investment. However, a lower value is observed, mainly caused by the insignificant impact of financial liberalization on private investment. Such a behaviour is detected across the different sub-samples of companies (regressions 1 to 22), thus explaining the heavy reliance of firms on internal finance.

Column 3 reports the results for a sub sample of the top 100 companies (regression 3). Liquidity has a positive and significant coefficient at the 5% level, implying that even for the largest 100 companies, internal liquidity plays an important role in influencing investment decisions. Several reasons might explain such behaviour. They may operate an effective treasury department and invest in projects as and when funds are available internally. Investment is thus an on-going process so long as there are funds in the till. Moreover, the treasury department of some firms might find it easier and cheaper to use internal funds as the cost of capital is zero.

However, contrary to the full sample of firms, the coefficient of debt is also both positive and significant. It implies that the large firms are able to credibly signal their credit worthiness to banks and thus secure loans more easily. Hence, investment is also dependent by debts taken from banks. These large firms have a tendency to reinvest their profits generated by making appropriate provisions for reserves. Such internal liquidity is used to fund investment projects and thus is coupled with loans for an effective management of cash flow in the organisation. Both the Sargan and the Wald test confirm the viability of the model, with p values of zero.

However, for the 'other companies', the results in column 4 show that the coefficient of internal liquidity is both positive and significant, while for debt is insignificant. These firms thus cannot use external financing from banks either because of a high cost of same or because of asymmetric information to banks on the viability of their projects. For this sub-sample, even though the Sargan test is barely accepted with a p value of 0.45, the Wald test accepts all variables in the model.

9.2. **Empirical results from other forms of corporate arrangements.** In this part, a number of sensitivities are made to compare the relationship between internal finance and investment strategies are conducted. The different sub-samples used and the results are as follows:

9.2.1. *Group structures v/s non-group affiliated firms.* Out of the full sample of firms, there were 215 enterprises which were organised as a group. This takes forms in several forms but mostly integrated either in the forward or backward direction. In column 5, results for the sub-sample of 215 group affiliated companies only (regression 5) are reported. It is found that the coefficient of liquidity is significantly positive but is much larger (8.54) than the coefficient (0.58) that was estimated from the non-group firms in column 6 where a sample of 83 firms was used. In both specifications, quite significant second order autocorrelation is observed, but the overall models are easily accepted.

Corporate debts, however, remain insignificant throughout. These can be explained by the existence of internal capital market within the group of firms. Investment in one enterprise may be financed by the excess funds that are available in another firm to avoid costly external borrowing outside the group. An analysis of companies reveals that there are heterogeneous units in different groups and not all of them have satisfactory performance indicators. Moreover, there only a few large groups such as the State Bank Group, Mauritius Telecom. Rogers Group, CIM Group, Ireland Blight Group, Currimjee group, and a few other conglomerates. The other groups are relatively small in size and include those in food production and distribution such as Li Wan Po, the food Canners Group and others. These firms thus do not get financing easily in the external market. This explains the overall insignificant coefficient of debt.

9.2.2. *Local v/s international firms.* Column 7 and 8 contrast the results of the model estimated from a sample of 195 local firm and 103 international firms respectively. These models are correctly specified with appropriate Wald and Sargan tests statistics. A positive and significant effect on the liquidity variable is observed. However, the impact is different; higher liquidity coefficient for local firms (5.54) than for international firms (0.576). The latter firms are better able to obtain external financing from their international businesses and affiliates, rather than having to deplete internal resources like local firms who find it rather difficult to access the external financial market. The coefficient of debt is also highly intuitive. While an insignificant coefficient is found for the local firms, a highly significant one is observed for the international firms. Thus, such enterprises are able to take loans in the external market. Since debt is measured by the total liabilities of firms, this result may imply that firms with an international affiliation are considered as strong enough for financial institutions to trust them and allocate credit to them.

They might benefit from credit terms either in the domestic market, or internationally with a much wider choice. International firms either borrow from their overseas counterparts to

fund investment projects. International firms have been seen to conduct international financial management strategies. In order to finance investment projects, they may borrow in the country where the cost of capital is low. Borrowing in other financial markets internationally might also be much easier and more accessible.

9.2.3. *Good v/s poor banking relationship.* Maintaining a good relationship with financial institutions such as banks is considered as an important determinant for access to financing. The tested hypothesis is as follows: whether firms having a poor banking relationship rely on internal finance, and whether they are able to obtain credit from the market as opposed to those with good banking relationship. A firm has been classified as one having a good banking relationship if bank loan/total debt ratio exceeds or equals one. This means that the firm has got a higher portfolio of loans in its debt component and hence banks maintain a good ongoing relationship in terms of availability of information of the company through regular submission of financial reports to banks. Relationship managers in banks may also be engaged in conducting frequent site visits to oversee the activities of the firm.

The sample of firms is segregated based on the above classification and estimate equation 1 based on a sub sample of 154 firms and reported in column 9. Liquidity coefficient is positive (0.985) and much lower than the coefficient (3.22) obtained for the sub sample of 144 firms having a poor banking relationship. Firms with good banking relationship are better able to credibly signal their projects to financial institutions that easily finance their projects. Hence, they heavily depend on internal finance and have to use internal liquidity. They also, presumably, obtain cheaper finance than those without a good liaison with banks. This is also explained by the positive and significant coefficient of debt on corporate investments, in contrast to those with poor banking relationships. However, both models suffer from second order autocorrelation with p values 0.52 and 0.65 respectively. But the Wald test, Sargan test statistics and the first order autocorrelation are satisfactory.

9.2.4. *Good versus bad corporate governance.* The corporate governance structure of firms is a major determinant in maintaining trust with providers of credits. For instance, a large number of independent directors in a corporate board are expected to take more effective decisions than a board with dependent/related directors having related party transactions with the company. The extent of corporate governance in the organisation is measured by the proportion of independent directors that the firm has and taken to be at least 75% independent directors. Column 11 and 12 illustrate the results of equation estimated with sub samples of firms with good corporate governance (n= 108) and those with poor corporate governance arrangements (n = 190).

These models are correctly specified with a higher liquidity coefficient for firms with poor corporate governance and lower for those with good corporate governance. A good composition of the Board of Directors serves several purposes: better credit signal is given to lenders of financial products, hence rendering it much easier to obtain cheaper finance; there is a better planning and coordination to undertake more projects; and managers do not overinvest free cash flows for private benefits. These are coupled with a positive and significant coefficient of debt for those with good corporate governance in contrast to those with poor corporate governance arrangements.

9.2.5. *Listed v/s unlisted firms.* Listed firms are basically expected to obtain liquidity on the stock exchange. In column 13, the model for the 38 listed companies is estimated, augmented with liquidity and debt variables. Column 14 generates the results of the remaining 260 firms in our sample. Apart from second order autocorrelations in the models, they are easily accepted with the other tests. Two pertinent results thus emanate. Debt is insignificant and the liquidity variable is significant and positive at the 5% level. The liquidity variable is however lower for listed companies (0.021) and higher (0.2231) for unlisted firms. The former companies easily get finance on the stock market for investment purposes that unlisted ones which heavily depend on

internal financing. The listed firms still depend on internal finance for investment expenditure probably because of a lower cost associated with this medium of financing. There is a lack of other financing options for them. Moreover, listed firms might have a number of transaction costs and other associated cost which prevent an efficient trading environment on the stock market.

Table 2: GMM estimates of the accelerator model (Arellano and Bond in first differences)							
Dependent variable: [I_{it}/K$_{t-1}$]							
Sample period: 1994-2007 - Pre Financial Crisis Period							
Regressions	1	2	3	4	5	6	7
	Total	Total	Top100	Other	Group	Non-group	Local
[$I_{i,t-1}$/K$_{i,t-2}$]	0.85	0.54	0.2	0.54	0.87	0.84	0.32
	(4.5)*	(4.8)*	(3.2)*	(4.2)*	(5.2)*	(1.9)**	(2.0)**
[Y_{it}/K$_{i,t-1}$]	1.32	1.32	1.02	0.98	0.52	0.66	0.68
	(6.2)*	(1.9)**	(4.2)*	(5.8)*	(12.6)*	(5.2)*	(5.3)*
[Y_{it-1}/K$_{i,t-2}$]	1.032	1.025	1.589	1.47	1.30	0.547	0.98
	(15.4)*	(17.5)*	(4.2)*	(7.1)*	(6.9)*	(7.2)*	(3.6)*
LIQ$_{it}$/K$_{i,t-1}$		5.8	3.7	2.58	8.54	0.58	5.54
		(5.0)*	(6.8)*	(6.9)*	(3.9)*	(6.5)*	(8.5)*
DEBT$_{it}$/K$_{i,t-1}$		0.54	0.96	0.56	0.57	0.85	0.34
		(1.2)	(4.3)*	(0.5)	(1.3)	(1.2)	(0.8)
FIDEV*LIQ$_{it}$		0.20	2.5	1.9	0.14	0.2	0.1
		(14.2)*	(8.3)*	(9.3)*	(4.75)*	(7.61)*	(5.1)*
FINLIB*LIQ$_{it}$		0.0004	0.0001	0.005	0.004	0.006	0.008
		(1.9)	(3.0)	(0.9)	(1.6)	(2.5)*	(3.2)*
No. obs.	2086	2086	700	1386	1505	581	1365
No. firms	298	298	100	198	215	83	195
Wald Test (p-values)	0.00	0.02	0.00	0.05	0.42	0.00	0.30
Sargan Test (p-values)	0.00	0.3	0.00	0.45	0.39	0.05	0.10
Arellano-Bond test of 1st ord. autocor. (p-values)	0.00	0.000	0.000	0.000	0.0007	0.0009	0.000
Arellano-Bond test of 2nd ord. autocor. (p-values)	0.24	0.247	0.265	0.365	0.424	0.462	0.385
t-statistics denoting significance are reported in parentheses							
*means significance of variable at the 1% level							
**means significance at the 5% leve							
Source: Author							

9.2.6. *Sectoral analysis.* In this section, equation 4.1 is estimated in different sub-sectors in order to compare the behaviour of firms in alternative sectors in terms of their reliance on internal financing. Table 3 illustrates results for the different industries; a sub sample of 18 banks (column 15), 20 insurance companies (column 16), 12 leasing companies (column 17), 65 hotels (column 18), 92 manufacturing companies (column 19), 4 oil companies (column 20), 39 companies in the distributive trade (column 21) and 66 construction companies (column 22). The liquidity variable is positive and significant across the board and resort to a greater extent towards internal financing for investment purposes.

Table 2: CONTINUED							
Regressions	8	9	10	11	12	13	14
	Inter.	Good	Poor	Good	Poor	Listed	Unlisted
		Banking	Banking	Corp.	Corp.		
		Rel.	Rel.	Gov.	Gov.		
$[I_{i,t-1}/K_{i,t-2}]$	0.55	0.21	0.82	0.23	0.67	0.66	0.54
	(2.9)*	(4.1)*	(6.3)*	(18.1)*	(6.1)*	(5.8)*	(7.1)*
$[Y_{it}/K_{i,t-1}]$	0.54	0.76	0.41	0.54	0.58	0.98	0.94
	(9.0)*	(4.7)*	(4.3)*	(8.5)*	(6.3)*	(3.2)*	(4.0)*
$[Y_{it-1}/K_{i,t-2}]$	0.21	0.005	0.69	1.74	0.24	0.02	0.89
	(3.5)*	(4.5)*	(5.8)*	(4.8)*	(7.1)*	(5.2)*	(4.1)*
$LIQ_{it}/K_{i,t-1}$	0.987	0.98	3.22	0.32	2.55	0.05	0.21
	(6.8)*	(9.8)*	(9.5)*	(5.8)*	(9.7)*	(5.2)*	(5.6)*
$DEBT_{it}/K_{i,t-1}$	0.57	0.32	0.666	0.54	0.24	0.32	0.24
	(11.0)*	(10.6)*	(0.8)	(11.2)*	(0.1)	(0.54)	(0.02)
$FIDEV*LIQ_{it}$	0.005	0.3	0.89	0.05	0.58	0.01	0.34
	(3.1)*	(5.2)*	(6.5)*	(3.2)*	(4.5)*	(4.2)*	(4.9)*
$FINLIB*LIQ_{it}$	0.365	0.0087	0.023	0.005	0.263	0.0004	0.002
	(1.8)	(2.7)*	(1.5)	(2.2)*	(2.1)**	(1.9)	(2.5)**
No. obs.	721	1078	1008	756	1330	266	1820
No. firms	103	154	144	108	190	38	260
Wald Test (p-values)	0.06	0.47	0.01	0.34	0.04	0.00	0.01
Sargan Test (p-values)	0.005	0.28	0.06	0.22	0.32	0.00	0.05
Arellano-Bond test of	0.000	0.000	0.0006	0.0002	0.0006	0.0007	0.0008
1st ord. autocor. (p-values)							
Arellano-Bond test of	0.325	0.524	0.657	0.214	0.253	0.635	.524
2nd ord. autocor. (p-values)							
t-statistics denoting significance are reported in parentheses							
*means significance of variable at the 1% level							
**means significance at the 5% leve							
Source: Author							

However, liquidity coefficients are higher for the sample of banks, insurance, manufacturing, construction companies and much lower for leasing, hotels, oil companies and those engaged in distributive trade and hence more financially constrained. Most hotels form part of large multinational chains and resort to internal financing within the group. Such is also the case for the oil companies while most leasing companies belong to large corporate groups. The debt variable is insignificant in all regressions, except for banks and insurance companies, thereby showing that firms do not really resort to external debt to finance activities. Banks and insurance companies are already in the financial sector and are high credit worthiness companies that make a large amount of intercompany transactions. They obtain credits from other counterparts much easier. The coefficient of debt is insignificant in the other sectors as there are any enterprises in these sectors which fail the credit appraisal process of financial providers in the market.

Table3: Sectoral results: GMM estimates of the accelerato rmodel								
(Arellano and Bond in first differences)								
Regressions	15	16	17	18	19	20	21	22
	Banks	Insur	Leasing	Hotels	Manuf	Oil	Dis.Trade	Constr.
$[I_{i,t-1}/K_{i,t-2}]$	0.24	0.24	0.65	0.23	0.54	0.34	0.45	0.31
	$(4.8)^*$	$(4.5)^*$	$(5.7)^*$	$(6.5)^*$	$(6.5)^*$	$(4.5)^*$	$(10.2)^*$	$(18.2)^*$
$[Y_{it}/K_{i,t-1}]$	0.65	0.76	0.974	0.69	0.87	0.58	0.877	0.599
	$(6.0)^*$	$(3.6)^*$	$(4.1)^*$	$(3.0)^*$	$(6.1)^*$	$(7.1)^*$	$(6.2)^*$	$(5.1)^*$
$[Y_{it-1}/K_{i,t-2}]$	0.64	0.21	1.57	1.69	1.32	0.135	0.54	0.69
	$(3.0)^*$	$(3.0)^*$	$(3.5)^*$	$(3.0)^*$	$(9.2)^*$	$(6.7)^*$	$(8.4)^*$	$(5.4)^*$
$LIQ_{it}/K_{i,t-1}$	5.2	2.98	0.0055	0.0024	6.55	0.0057	0.67	6.25
	$(6.9)^*$	$(12.8)^*$	$(8.7)^*$	$(17.2)^*$	$(3.9)^*$	$(3.5)^*$	$(4.2)^*$	$(5.6)^*$
$DEBT_{it}/K_{i,t-1}$	0.31	0.54	0.33	0.25	0.32	0.57	0.34	0.13
	$(10.3)^*$	$(11.2)^*$	(1.6)	(1.1)	(1.2)	(1.2)	(0.5)	(1.2)
$FIDEV*LIQ_{it}$	0.24	0.74	0.002	0.005	0.69	0.04	0.06	0.69
	$(5.8)^*$	$(9.1)^*$	$(5.0)^*$	$(13.5)^*$	$(7.2)^*$	$(4.7)^*$	$(5.8)^*$	$(10.2)^*$
$FINLIB*LIQ_{it}$	0.006	0.12	0.0003	0.002	0.25	0.02	0.05	0.36
	$(3.02)^*$	$(3.9)^*$	(1.95)	$(2.5)^*$	$(3.2)^*$	(1.5)	(1.0)	(1.2)
No. obs.	126	140	84	455	644	28	273	462
No. firms	18	20	12	65	92	4	39	66
Wald Test (p-values)	0.00	0.04	0.41	0.25	0.02	0.47	0.00	0.05
Sargan Test (p-values)	0.00	0.01	0.34	0.01	0.00	0.28	0.00	0.31
Arellano-Bond test of 1st ord. autocor. (p-values)	0.000	0.0005	0.0008	0.0004	0.000	0.000	0.000	0.000
Arellano-Bond test of 2nd ord. autocor. (p-values)	0.224	0.254	0.365	0.6474	0.214	0.642	0.31320	0.5102
t-statistics denoting significance are reported in parentheses								
*means significance of variable at the 1% level								
**means significance at the 5% leve								
Source: Author								

10. Conclusion and policy implications

This paper has provided additional empirical evidence on the relationship between internal liquidity and investment in the case of a small island developing states like Mauritius. Moreover, the results are more reliable that the results obtained by previous researchers (e.g., FHP, 1988, Cho, 1995) because of the use of a more rational improved measure of internal finance, in line with IFRS 7.

The sensitivity of investment to internal finance (liquidity) has been tested. To this end, an improved measure of internal cash flow (net-liquidity), which comprises of cash flow plus short-term liquid investments and any liquid asset for which there is a readily available market, is used. Unlike previous studies, this research has been extended to the banking, insurance, leasing, hotel, oil, retail/distributive trade and the construction industry. Three investment models, namely the sales accelerator model, the error correction model and the Euler equation models have been used. All models confirm the results obtained through the Accelerator model.

It is found that companies in different sectors have different modes of financing investment expenditures and a high volatility of capital structure choice is noted. While most firms do not resort to debts and rely mostly on internal finance to fund investment projects, especially firms in the following sectors: independent firms, local firms, those with poor banking relationship, with poor corporate governance arrangements, unlisted companies, banks, insurance and manufacturing, construction companies while group-affiliated firms, international firms, those

with strong corporate governance arrangements, with good banking ties, leasing, hotels, oil companies and those engaged in distributive trade are less constrained.

However, some categories of firms use both internal finance as well as debt in the external market. Firms that combine internal finance with external debt are the biggest top 100 companies, those having a good asking relationship, firms with good corporate governance arrangements and the international firms. Surprisingly, listed companies rely on internal finance for investment expenditures, with no reliance on external debt.

Several policies are thus proposed to the authorities to broaded access to corporate finance, such as adoption of strategies to make the stock market more liquid, focus on financial sector development – licensing of more financial institutions, importance of a Development Bank, concessionary loans and partial guarantee schemes, amongst others.

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11. Appendices: Sensitivity analysis with alternative investment models

11.1. A. Empirical results from Error-Correction model.

The following model was used by Cho (1995):

$$[I_{it}/K_{i,t-1}] = \rho[I_{i,t-1}/K_{i,t-2}] + \beta\Delta y_{it} + \gamma(k-y)_{i,t-1} + \alpha_i + \alpha_t + v_{it} \qquad (11.1)$$

Augmented model:

$$\begin{aligned} [I_{it}/K_{i,t-1}] &= \rho[I_{i,t-1}/K_{i,t-2}] + \beta\Delta y_{it} + \gamma_1(k-y)_{i,t-1} + \gamma_2 DEBT_{it-1} + \\ &\quad \gamma_3 LIQUIDITY_{it-1} + \gamma_4 FINDEV * LIQUIDITY_{it-1} + \\ &\quad + \gamma_5 FINLIB * LIQUIDITY_{it-1} + \alpha_t + v_{it} \qquad (11.2) \end{aligned}$$

In the above equation, y means change in output, and k refers to change in capital. It is an investment equation derived by the deviation from a long run desired relation in the steady state.

As explained by Cho (1995), the proportionality condition imposed in the above equation depends on constant returns to scale and it can be tested by including an additional $k_{i,t-1}$ or $y_{i,t-1}$ term. The coefficient on the error correction term is expected to be negative, so that a capital stock above the long run desired level is associated with lower level of investment in the future, and vice versa.

The model is satisfactory as per the statistical tests and the error correction term is negative and significant throughout the various specifications. Investment level, which is above the long

run desired level in period 1, is associated with a lower level in the following period. We observe that even though the Sargan p values are accepted only marginally, the validity of the instruments used is not rejected at the 5% level. The empirical results are available from the authors.

11.2. **B. Empirical results from Euler Equation model.** The following model was used by Cho (1995):

$$
\begin{aligned}
[I/K]_{it} \;=\; & \beta_1(I/K)_{i,t-1} + \beta_2(I/K)^2_{i,t-1} + \beta_3(\pi/k)_{i,t-1} + \\
& \beta_4(Y/K)_{i,t-1} + \alpha_i + \alpha_t + v_{it}
\end{aligned}
\tag{11.3}
$$

where $\pi_{it} = P_{it}Y_{it} - W_{it}L_{it}$ is gross operating profit. Cho (1995) again assumed that time specific effects and firm specific effects control adequately for the variation in the user cost of capital.

Augmented model:

$$
\begin{aligned}
[I/K]_{it} \;=\; & \beta_1(I/K)_{i,t-1} + \beta_2(I/K)^2_{i,t-1} + \beta_3(\pi/k)_{i,t-1} + \\
& \beta_4(Y/K)_{i,t-1} + \beta_5 DEBT_{it-1} + \beta_6 LIQUIDITY_{it-1} + \\
& \beta_7 FINDEV * LIQUIDITY_{it-1} + \\
& \beta_8 FINLIB * LIQUIDITY_{it-1} + \\
& \alpha_i + \alpha_t + v_{it}
\end{aligned}
\tag{11.4}
$$

As per the econometric results obtained, the Sargan test does not reject the validity of the instruments used and tests for over-identifying restrictions are satisfactory. First and second order auto correlation are also unproblematic. In the absence of any form of financial constraints, we should find B1>1, B2<-1, B3<0, and B4>0, and these predictions are valid in the regressions. The results confirm the fact that financial liberalisation has been rather ineffective in influencing private investment, unlike financial development. The empirical results are available from the authors.