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FINANCIAL CONSTRAINTS, INDUSTRY GROWTH AND INVESTMENT CASH FLOW SENSITIVITY OF NON-FINANCIAL FIRMS LISTED AT THE NAIROBI SECURITIES EXCHANGE, KENYA

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Abstract

Industry growth is the key to decisions involving financing and investments. The level at which an industry grows is associated to firm growth. However financial constraint has been one of the key challenges facing firm growth in the world. This study sought to determine the role of industry structure on the relationship between financial constraints and investment cash flow sensitivity (ICFS) of non-financial firms listed at the Nairobi Securities Exchange (NSE) for the period 2010-2019. Agency Cost and Trade-off theories provided theoretical basis of this study. The study adopted positivism as the research philosophy while a combination of descriptive and longitudinal survey designs was used. The study embraced census survey. The population of

the study consisted of 33 non-financial firms which traded at the NSE consistently over the period of the study. Secondary panel data was obtained from the NSE website and Economic Survey reports for 2010-2019. Baron and Kenny technique was used to test the moderating effect of industry growth on the relationship between the firm financial constraints and investment cash flow sensitivity. The study concluded a significant financial constraints and ICFS relationship with reference to NSE non-financial firms and further industry growth also showing a relationship that is significant on how financial constraints and ICFS relate. Based on the results of this study, the government through Capital Markets Authority (CMA) and other stakeholders in the Kenyan corporate sector should develop appropriate policies in an attempt to organize the debt capital market to enable Kenyan corporate bodies get access to low cost long term debt capital to finance their investments and operations.

Keywords: Financial Constraints, Investment Cash Flow Sensitivity, Industry Growth, Non-Financial Firms, Nairobi Securities Exchange

INTRODUCTION

Investment cash flow sensitivity (ICFS) changes proportionately with the level of a firm's financial constraint (FC) as noted in Fazzari, Hubbard and Peterson (1988), Hoshi, Kashyap and Scharfstein (1991) and Agca and Mozumdar (2012). Kaplan and Zingales (1997), Hassett and Oliner (2012) and Farre-Mensa and Ljungqvist (2013) however show that ICFS can be high for firms which are financially unconstrained creating a puzzle on the actual relationship between the two variables.

Fazzari, Hubbard and Peterson (1988) define investment cash flow sensitivity as a coefficient relating to the changes arising from decisions at capital investment and the cash flow generated from firms' internal sources. It is where decisions involving investments rely majorly on cash flow generated internally. The concept of financial constraints and its measurements therefore becomes well understood when ICFS is studied. Firms registering ICFS that is positive experience high costs of capital from external sources as compared to those firms with negative ICFS. The firms in this category are regarded small and also their payments of dividends are low as a result of low bond rating and tangibility in assets.

This study operationalizes ICFS using the coefficient of new investments to operating cash flows as measured by new property plant and equipment and net income before extra-ordinary items respectively, consistent with Agca and Mozumdar (2008), Jordan et al. (2011) and Ding et al. (2013).

Financial constraint is depicted when the firm's investment is limited to the internal funds generation and being unable to get sufficient external funds (Mulier, Schoors & Merlevede, 2016). Silva and Carreira (2012) define financial constraints as the inability of a firm to raise finances for optimal functions. Furthermore, Lamont et al., (2001) defines financial constraint as a financial friction that makes a firm incapable to fund or cushion investments that are desired. Kaplan and Zingales (1997) define financial constraint to be the wedge existing between costs at both external and internal sources.

The degree of financial constraints is dependent on imperfections on market resulting to asymmetry in information. This is key since information asymmetry is vital in determining costs relating to internal and external levels of financing which is also defined according to how development in capital market exists. Financial constraint is measured by liquidity, profitability and levearage.

Industry growth rate affects firms' access to external financing as well as growth opportunities (Korajezyk & Levy, 2002). During expansionary seasons, firms face increased demand for debt to finance new investments which come up with economic growth.

Haller (2012) defines industry growth as the increase in the industry capacity to produce goods and services under the comparable periods. The growth in industry is key to decisions involving financing and investments. The level at which an industry grows is associated to macroeconomic factors which define operating environment and also dictates the risks of political and social wellbeing including regulations from the government. Industry growth significantly affects the growth of a firm.

McDougall, et al. (1994) indicates that the attractiveness of a certain market has been compounded by the rate at which growth happens in an industry either through firms that are established or those that are new and small, even to the point of being the sole measure of market attractiveness of the Boston Consulting Group's product- portfolio matrix. Industry growth has been used by Yip (1982) as an indicator of disequilibrium, Yip (1982) and Porter (1980) as a condition favorably associated with entry and (Yip, 1982; Porter, 1980) and Sandberg (1986) as an indicator of industry evolution.

Mwega and Ndungu (2004) applied industrial growth in their study. In measuring industrial growth rate, a base year industrial contribution to the GDP is net off the current year industrial contribution to GDP. The resultant differential industrial contribution to GDP is then divided by the base year industrial contribution to GDP. Anaman and Oseiamponsah (2007) measure industrial growth in terms of the data series at nominal time to GDP added value within the industry in construction in Ghana. This study measures change in firm industry contribution to the national GDP for industry growth rate in line with Muthama, Mbaluka and Kalunda (2013).

Literature reveals that new investments by listed firms in Kenya are mainly financed through bank loans and overdraft facilities, which poses very high financial risks in terms of bankruptcy costs from the view of both the managers and investors. Further, Okumu (2014) proves that firms listed in NSE have high cash flow sensitivities, dependent on size, liquidity and institutional ownership. Elie (2013) argues that manufacturing firms in Sub-Saharan Africa to which Kenya belongs, experience many severe constraints including financial aspects because of the existence of borrowers and lenders information asymmetry. Further, Wale (2014) adds to the argument that the high investment cash flow sensitivities as witnessed by many African firms arise from constraints in finances.

Financial markets in Sub-Saharan Africa, to which NSE belongs, are described as highly imperfect hence characterized with agency problems caused by information asymmetry, transaction costs and contracting costs (Eli, 2014). Firms listed at the NSE raise funds to finance new investments in form of equity and/or bonds (Kayo & Kimura, 2011). Lack of adequate and relevant legal and regulatory framework to enforce financial contracts has led to credit rationing and high collateralization which leads to financial constraints, hence under investment (Wale, 2014).

Furthermore, firms listed in NSE have consistently shunned the bonds market leaving financial banks as the key sources of funds for new investments as noted in Kayo and Kimura (2011) despite the recognition of the stock market as the most pragmatic and effective method of raising capital. While this leads to increased financial risks in terms of bankruptcy and other related distress costs, Kenyan managers imprudently continue financing new investments through bank loans and overdraft facilities.

The purpose of this study was to establish the moderating effect of industry growth on the relationship between firm financial constraint and investment cash flow sensitivity for firms listed at the Nairobi Securities Exchange. For meaningful results, secondary panel data for 33 non-financial firms were analyzed for 10 years over the period between 2010-2019, translating data set to 330. The period of study was relevant because it was within the time when many firms in Kenya were in financial crisis.

LITERATURE

Theories developed over time can be used to explain the relationships between ICFS and financial constraints and also the role of industry structure. The interactions of each theory on key concepts of the study have been developed based on key assumptions, critique and importance to the current study. Theories discussed include: Agency, Trade-off and Pecking Order. The agency theory by Jensen and Meckling (1976) informs financial constraints variable

with the argument that decisions arising from control and ownership influences the navigation in financial constraints. The trade-off theory put forward by Jensen (1986) and also by Myers (1984) informs industry growth through financing with the argument on firms trying to balance benefits and costs when taking additional financing to grow. The proponents of the theories were developed and extensively enhanced by other researchers based on their findings.

Studies have connected growth in industry with financing choices and decisions. Booth et al. (2001), centered on capital structure in nations that are developing and found that growth in industry enhances long-term book-debt ratio as well as total debt ratio. Korajaczyk and Levy (2002) considered capital structure decision and financial related requirements. The study presumed that conditions on finances influence financing choices and mirror the condition of the economy. Henceforth development in financial systems rate emphatically influences ratio of leverage (Booth et. al., 2001). A few macroeconomic factors, for example, growth in industry and total national output essentially impact firm's capital structure and choices in investment (Booth et al. 2001).

Muthama, Mbaluka and Kalunda (2013) examined the impact of macroeconomic factors on the capital structure of chosen firms in Kenya. The example comprised of 39 firms recorded in the NSE for the period somewhere in the range of 2004 and 2008. Firms' influence (obligation) proportions were relapsed against industry growth, GDP rate of growth and changes in costs. It was found that the influence of constrained firms differs with macroeconomic variables. Further capital structure and macroeconomic factors significantly relate. This is upheld by Booth et al. (2001), and steady with Rajan and Zingales (1995). Nonetheless, Muthama, Mbaluka and Kalunda (2013) showed no effect of other macroeconomic components like the capital market improvement on structure or capital. The study however shy away from relating financial decisions with related influencing factors.

METHODS

The study was based on a positivist philosophy approach and combination of descriptive and longitudinal surveys. The study targeted the listed companies from all sectors of the economy in Kenya, except insurance and banking industries due to their unusual capital structures caused by regulatory and legislative policies. There were 64 NSE listed companies as at 31st December 2019 (NSE, 2014). Excluding the insurance and banking industries leaves a net population of 48 firms belonging to non-financial sector. This study aimed at using secondary data obtained from the NSE data base. Annual audited financial statements of the targeted population were the key sources of data. This was obtained from the respective firm's website and the NSE data base and recorded on a data collection sheet. The secondary data related to

the respective firms" audited financial statements within periods of performance covering 2010-2019. Research hypotheses were tested using quantitative techniques. Barron and Kenny approach was applied for the moderating influence of industry structure.

ANALYSIS AND RESULTS

The analysis of findings relates to key hypothesis analyzed on the basis of the effect of industry growth on financial constraints and investment cash flow sensitivity relationship among NSE listed non-financial firms is not significant. Prior to diagnostic test, trend analysis was undertaken first which revealed the variations of the study variables within the span of ten years. The outcome of analysis of the time series changes of the variables was presented using graphical models. Trend analysis for ICFS was carried out to determine the general changes. Figure 1 below shows the ICFS trend for the 33 listed non-financial firms at the NSE from 2010 to 2019:

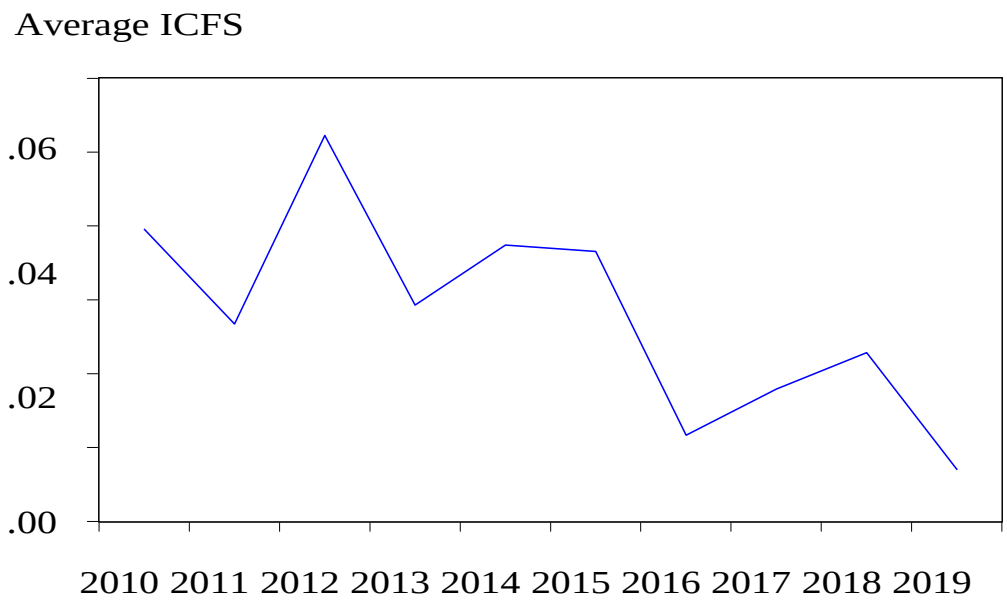

Figure 1: Trend of ICFS for the year 2010– 2019

Figure 1 above indicates that the mean value of ICFS variable for the firms listed at the NSE had a decreasing trend between year 2010 and 2019 in general. The general trend was made up of short term up and down periodical movements. The trend was uprising in 2011, 2013, 2016 to 2018 after which they are followed by a drop in subsequent years.

The trend exhibited different growth rates whose mean trend is presented in Figure 2.

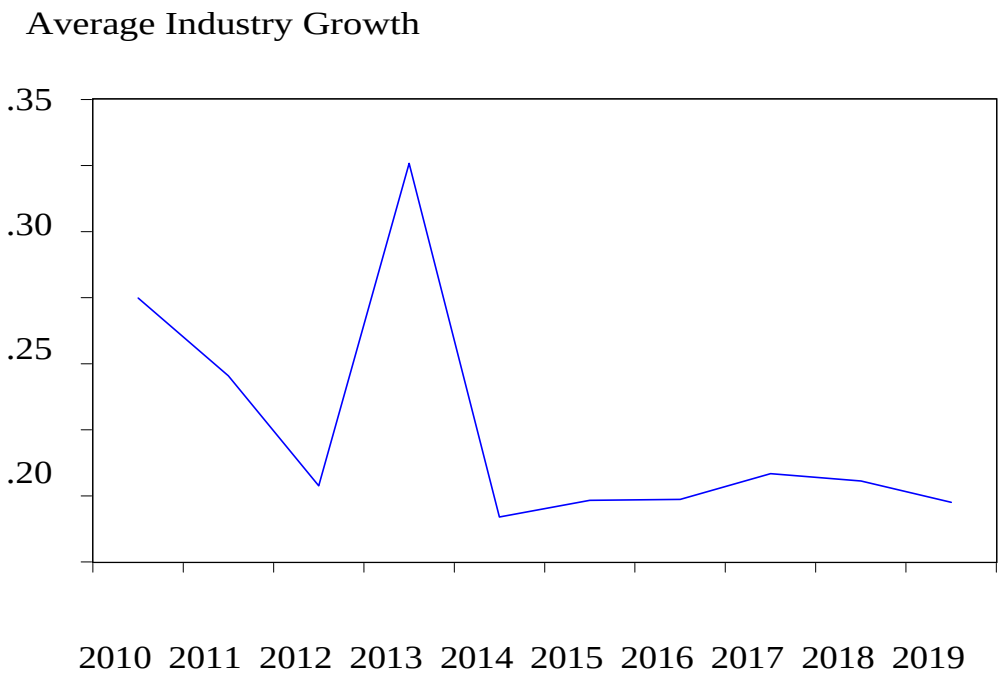

Figure 2: Trend of Industry Growth Rate for the Year 2010 – 2019

As presented in Figure 2 above, the general trend in industry growth rate between 2010 and 2019 has been on a decline. There was a short-term decline between 2010 and 2012 and a short-term increase in 2013 followed by a decline in 2014. Between 2014 and 2019, a short-term increase led to a short-term decline.

Stepwise regression analysis was used to assess if growth in industry rate moderated the financial constraints and ICFS relationship. This was the test of the hypothesis that:
The effect of growth of industry on the financial constraints and ICFS relationship of NSE listed non-financial firms is not significant. The first hypothesis: was ***H_1:*** *The effect of growth in industry on leverage and ICFS relationship of NSE listed non-financial firms is not significant.*

Table 1: Model Goodness of Fit for Leverage, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	R	R2	Adjusted R^2	SE
1	.033[a]	.011	.008	.17243

a. Predictors: (Constant), Lev *growth in industry, Leverage, Growth in industry

The multiple regression model as presented in Table 1 above and Table 2 below produced Adjusted R^2 = 0.008, F (3,329) = 0.116, p>0.05. The model therefore infers that 0.8% of variations in ICFS are explained by variations in firm leverage and growth in industry rate.

Table 2: Model Overall Significance of Leverage, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	Sum of Squares		Df	Mean Square	F	Sig.
1	Regression	.010	3	.003	.116	.951[b]
	Residual	9.693	326	.030		
	Total	9.703	329			

a. Dependent Variable: ICFS

b. Predictors: (Constant), Lev*growth in industry, Leverage, Growth in industry rate

As presented in Table 3 below, the regression model one shows negative results between leverage and ICFS which is not statistically significant (β=-0.001, t=-0.014, p>0.05) implying that for every unit increase in leverage, there is an expected decrease in ICFS by 0.001 units. There is also a negative relationship between growth in industry and ICFS which is not statistically significant (β=-0.057, t =-0.520, p>0.05) implying that for every unit increase in growth in industry rate, there is an expected decrease in ICFS by 0.057 units.

Table 3: Model Regression Coefficients of Leverage, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.041	.017		2.373	.018
	Leverage	-.001	.065	-.001	-.014	.989
	Growth in industry	-.064	.123	-.057	-.520	.603
	Lev*Indgrow	.185	.462	.048	.402	.688

a. Dependent Variable: ICFS

Table 3 above presents a positive result between the interaction term of leverage and growth in industry rate on one hand and ICFS on the other hand which is not statistically significant (β=0.048, t =0.402, p>0.05) implying that for every unit increase in the interaction term between leverage and growth in industry rate, there is an expected increase in ICFS by 0.048 units. The

findings therefore lead to acceptance of sub hypotheses one (H_1) as there is no significant results between the interaction term of leverage with growth in industry rate and ICFS.

The second hypothesis is shown as: ***H_2: The effect of growth in industry on liquidity and investment cash flow sensitivity relationship of non-financial firms listed at the NSE is not significant.***

Table 4: Model Goodness of Fit for Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	R	R2	Adjusted R^2	SE
1	.093[a]	.009	.000	.17177

a. Predictors: (Constant), Liq*indG, Growth in industry, Liquidity

The multiple regression model as presented in Table 4 above and Table 5 below produced Adjusted R^2 = 0.000, F (3,329) = 0.954, p>0.05. The model therefore infers that 0.0% of variations in ICFS are explained by variations in firm liquidity and growth in industry rate.

Table 5: Model Overall Significance of Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.084	3	.028	.954	.415[b]
	Residual	9.619	326	.030		
	Total	9.703	329			

a. Dependent Variable: ICFS

b. Predictors: (Constant), Liq*indG, Industry growth, Liquidity

As presented in Table 6 below, the regression model one shows a positive results of liquidity on ICFS which is not statistically significant (β=0.111, t =1.610, p>0.05) implying that for every unit increase in liquidity, there is an expected increase in ICFS by 0.111 units. There is also a positive result between growth in industry and ICFS which is not statistically significant (β=0.009, t =0.129, p>0.05) implying that for every unit increase in growth in industry rate, there is an expected increase in ICFS by 0.009 units.

Table 6: Model Regression Coefficients of Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.024	.015		1.594	.112
	Liquidity	.007	.004	.111	1.610	.108
	Growth in industry	.010	.077	.009	.129	.897
	Liq*indG	-.015	.023	-.050	-.634	.527

a. Dependent Variable: ICFS

Table 6 above presents a negative result between the interaction term of liquidity and growth in industry rate on one hand and ICFS on the other hand which is not statistically significant (β=-0.050, t =-0.634, p>0.05) implying that for every unit increase in the interaction term between liquidity and growth in industry rate, there is an expected decrease in ICFS by 0.050 units. The findings therefore lead to acceptance of hypothesis two (H_2) as there is no significant results between the interaction term of liquidity with growth in industry rate and ICFS. The third sub hypothesis is shown as:

H_3: *The effect of growth in industry on profitability and* ICFS *relationship of NSE listed non-financial firms is not significant.*

Table 7: Model Goodness of Fit for Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	R	R2	Adjusted R^2	SE
1	.306[a]	.094	.085	.16426

a. Predictors: (Constant), Prof*indG, Growth in industry, Profitability

The multiple regression model as presented in Table 7 above and Table 8 below produced Adjusted R^2 = 0.085, F (3,329) = 11.210, p<0.05. The statistically significant model in explaining the results therefore infers that 8.5% of variations in ICFS are explained by variations in firm profitability and growth in industry rate.

Table 8: Model Overall Significance of Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.907	3	.302	11.210	.000[b]
	Residual	8.796	326	.027		
	Total	9.703	329			

a. Dependent Variable: ICFS

b. Predictors: (Constant), Prof*indG, Industrygrowth, Profitability

As presented in Table 9 below, the regression model one shows a positive result between profitability and ICFS which is statistically significant (β=0.131, t=2.164, p<0.05) implying that for every unit increase in profitability, there is an expected increase in ICFS by 0.131 units. There is also a negative result between growth in industry and ICFS which is not statistically significant (β=-0.008, t =-0.147, p>0.05) implying that for every unit increase in growth in industry rate, there is an expected decrease in ICFS by 0.008 units.

Table 9: Model Regression Coefficients of Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1	(Constant)	.021	.012	1.810	.071
	Profitability	.159	.074	.131	2.164	.031
	Growth in industry	-.009	.059	-.008	-.147	.883
	Prof*indG	1.343	.369	.220	3.636	.000

a. Dependent Variable: ICFS

Table 9 above presents a statistically significant positive results between the interaction term of profitability and growth in industry rate on one hand and ICFS on the other hand (β=0.220, t=3.636, p<0.05) implying that for every unit increase in the interaction term between profitability and growth in industry rate, there is an expected decrease in ICFS by 0.220 units. The findings therefore lead to rejection of hypothesis three (3) as there is a significant result between the interaction term of profitability with growth in industry rate and ICFS.

CONCLUSION AND IMPLICATIONS

The study established that growth in industry as measured by change in industrial contribution to GDP rate has a positive result with the ICFS. Hence, growth in industry enhances investments for companies listed at the Nairobi Securities Exchange, Kenya. There was however no significance registered when industry growth was subjected to determining if financial constraints and ICFS of NSE listed non-financial firms relate.

The third objective of the study was to establish the moderating effect of growth in industry on the results between financial constraints and ICFS of non-financial firms in Kenya. Growth in industry was the sectoral measure of growth measured as a percentage. To establish the moderating effect, a multiple regression model employed revealed that growth in industry has a significant at statistical level moderating effect on the results between profitability and ICFS of non-financial listed firms. However, the effect on the results between liquidity and cash flow sensitivity as well as leverage and cash flow sensitivity is not significant at statistical level.

Industrial growth also moderates the results between profitability and ICFS but not the results between ICFS and Leverage as well as liquidity. This can explain why many researchers who have tested the results between financial constraints as a composite variable not split into various sub variables or elements and firm ICFS have found contradictory results with some concluding that the results between the variables are positive, negative or not significant at all. This study has showed that the effect of financial constraints on firm ICFS can best be understood by considering how growth in industry and size of the firm influenced and affected the results between elements of financial constraints and ICFS of firms listed at the Nairobi Securities Exchange. The study recommends further research on financial firms listed at the NSE.

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