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# Cash Flow and Capital Account Liberalization on some Nigerian Firms' Investment Growth: The Sequel (Disaggregated Approach)

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## Abstract

This study examined the impact of cash flow, capital account liberalization (CAL) on investment growth of firms from both the direct and indirect channels, using the disaggregated firm-level data of 44 tradable and 31 non-tradable firms for the period of 2006 to 2016. It employed the differenced dynamic panel regression technique. Among others the results revealed that CAL is positively but insignificantly related to investment growth, and investment growth appeared to be determined by cash flow (internal) thereby indicating the presence of financial constraint for both samples. However, when we compared the level of financial constraint of the tradable and non-tradable firms, judging by the magnitude of the coefficients of cash flows in both samples, non-tradable firms were found to be severely financially constrained. The study also determined that CAL appeared to be sensitive to investment growth for both firm types through the indirect route, precisely the capital/credit availability channel measured as cash flow. The level of capital openness is still low for tradable firms hence the need for more but monitored openness.

**Keywords:** Capital Account Liberalization, Cash flows, Investment, Firms, Tradable firms, Non-Tradable Firms

## 1. Introduction

### 1.1. The Research Problem

In response to the unfavourable economic and financial conditions that characterized most economies, especially those in Sub-Saharan Africa (SSA), in the 1980s, Nigeria adopted the Structural Adjustment Programme (SAP). A programme that advocated for change from a close to an open economic system; as well as a market and private sector-driven one. A vital element of the programme in Nigeria is the Capital Account Liberalization (CAL) which was proposed to help bridge the huge savings-investment gap that characterized the economy due to low-income level. CAL is viewed from the microeconomic level as the removal of all forms of restriction thereby causing an

opening of the domestic stock market to foreigners as well as allowing local investors to invest abroad freely. This, therefore, presumes that capital should be re-shuffled from the capital-surplus economies with low expected returns on capital to capital-poor nations, with high potential to utilize resources due to the presence of high expected return. CAL has been seen to possess numerous benefits like booting of capital inflows, which will in turn reduce cost of capital, reduce financial constraint of small firms and in the long-run cause both domestic and foreign direct investment growth. (Obadan, 2006; Bankole, 2007). From the other angle, CAL has also been said to be bedeviled by some flaws such as fragmentation of the market, macroeconomic instability, capital flight declining welfare of the citizens to mention but a few. (Borensztein, Gregorio and Lee 1998). Extant studies on the impact of Capital Account Liberalisation on investment growth are cross-country and macro-based which did not give credence to the possible channels. Thereby leading to the production of weak or inconclusive results. This study by way of overcoming that shortcoming just like Okungbowa (2021) tilted towards the microeconomic-based analysis. Following the suggestion that investment related issues should be approached from the firm perspective (Eichengreen, 2001; Henry, 2007; Chang, 2012). This study adopted the firm level data of non-financial listed firms on the Nigeria stock exchange over the period 2006 to 2016 rather than macro-based data to examine the impact of cash flows and CAL on investment growth in Nigeria as well as the role that cash flow or financial constraint plays in the CAL-investment nexus.

### *1.2. Importance of the Problem*

Sequel to the dissimilarities that may occur among firms in terms of their level of capital openness and financial constraint or ability to attract external funds, this study differs from the earlier study Okungbowa (2021) by examining this topic of discourse from the disaggregated approach to check the firm type that impacts firm investment the most or possess the highest financial constraint. This study also differs by adopting only the cash flow channel. To the best of our knowledge, there are no previous studies on the impact of CAL on investment growth using firm-level measures of CAL and investment growth of firms in Nigeria and from the disaggregated angle.

The rest of the study is organized into, the literature review in the succeeding section 2. Followed by Sections 3 and 4 that house the theoretical framework, types/sources of data, method of analysis, hypotheses development and empirical analysis respectively. While sections 5 and 6 cover the discussion of results, conclusion, summary of findings and recommendations.

### *1.3. Relevant Literature Review*

In the extant literature, there appears to be a strong correlation between financial deepening and capital account openness and economic growth (Darat, 1999; Unamis, 2002; Khalid, 2007; Adam, 2011; Onwumre, Onudugo and Ibe, 2013). Also empirics that took their root from the seminal work of Feldstein & Horioka (1980) and those that countered their findings (Obstfeld & Rogoff, 2000; Ketenci 2015) are legion. The debate on the impact of CAL on investment growth is still ongoing as some studies concluded that a positive correlation runs between CAL and investment in both developed, developing and emerging countries (Desai, Foley, and James 2003; Shrestha and Chowdhury 2005; Asiedu and Gyimah-Brempong 2008; Deepak, Mody, and Murshid, 2001; Sarode (2012; Galindo, Sciantarelli, and Weiss 2001; Beck and Levine 2002; Chari and Henry 2003; Alfaro and Charlton 2006; Fry, 1980; Fry 1982; Agrawal 2004); other studies posit that there are no correlation between them rather capital openness impedes investment through capital flight ( Montiel and Reinhart 1999; Asiedu and Lien, 2004; Boamah, Craigwell, Downes, and Mitchell, 2005; Alfaro, Kalemli-Ozcan, and Volosovych, 2006; Aizenman and Noy 2003; Mody and Murshid, 2005; Adegbite and Adetiloye, 2013; and Bankole and Ayinde 2014). Saki, Boachie, and Nmurana, (2016) found a mixed outcome from the short and long-run. Few studies among those in the first category are of the opinion that the impact of CAL on investment growth may work through some channels and not necessarily impact investment automatically. (Deepak, Mody, and Murshid, 2001; Brafua and Biekpe, 2011; Noy and Vu, 2007; Chinn and Ito, 2008; Mouna and Mondher, 2014, Okungbowa, 2021)

From the indirect route, the neoclassical theory and some empirical studies posit that CAL may not translate directly into investment or economic growth. It could rather go through some channels like cost of equity capital,

high stock liquidity, changes in expected future earnings (profitability), access to foreign currency, and strong corporate governance channels. In the case of the capital/credit availability channel, precisely the cash flow-investment as advanced by Fazzari, Hubbard and Peterson (1988) who posited that sensitivity of investment to cash flow is stronger for high financial constraint firms. Also, Laeven (2001) being one of the earliest authors on studies around the role that cash flows play on domestic and foreign direct investment in the face of liberalization opined vehemently that investment is sensitive to cash flows, and that increased financial liberalization can translate into increase in stock liquidity and reduction in cost of equity capital. He also stated that firms especially small or non-tradable firms are highly constrained financially but this constraint can be eased off by financial liberalization or free- flow of capital. Sequel to that, studies have shown that non-tradable firms tend to benefit more from capital liberalization than tradable firms, as such, removal of the restriction on capital flow through CAL, increase debt holdings, opening firms up for franchise and others may impact them greatly. (Alessandro, Schindndler and Valenzuela, 2009; Lewellen and Lwellen, 2016; Pacheco, 2017; Ahiadorme et.al., 2018; Dogru and Upneja, 2019; Gupta and Mahakud, 2019). Contrary results was also found from earlier firm-level analysis in Ivory Coast, Taiwan, Ghana, Kenya (Evans and Jovanovic, 1998; Fafchamps and Oostendorp, 1999; Soderbom, 2001; Harrison and McMillian, 2003; Wang, 2003; Harrison, Love and McMillian, 2004; Barimah, 2010).

From the foregoing, it is evident that the debate is on-going, much focus has been on cross-country and macroeconomic based studies while country-specifics and firm level studies with recourse to stock exchange market liberalization have been ignored. A hand few of studies which went through the micro route also merged the firms and examined it from the aggregated perspective like the case of Okungbowa (2021). This study therefore contributes to knowledge by examining CAL-investment nexus from the direct and indirect channels using a disaggregated firm-level data of non-financial firms in the Nigeria stock exchange market.

### *Some stylized Facts*

#### 1.3.1. Capital Account Liberalization Trend for some listed firms based on sector

For the period under study, available data have shown that the listed firms vary in terms of their level of capital openness when viewed from the firm-level CAL as measured by (foreign institution ownership) used in the study both on individual firm level and on sector base (firm's Annual Reports for 2006 to 2016; SEC Annual Fact Books for 2006 to 2016). On the individual firm bases, Capital oil, an oil and gas sector firm, appears as the most liberalized firms among the 80 firms in this study for the period of 2006 to 2015. The firm has 90% foreign institutional ownership relative to the total ownership. However, its position in 2016 could not be ascertained as there was no record to that effect. A.G Leventis Nigeria (a conglomerate firm) top the list in the year 2016 but was in the second position between the years 2006 to 2015 with about 88% of the domestic firm owned by foreign institution. But on the average, and from the sectorial point of view, consumer sector firms appear to be the most liberalized while firms in the services and construction and real sectors are the least liberalized firms among the ten sectors and 80 firms understudy.

Figure 1.1 below which shows the average foreign institution ownership of the listed firm under study on a sector bases for the period of 2006 to 2016 gives a clear picture of the above description.

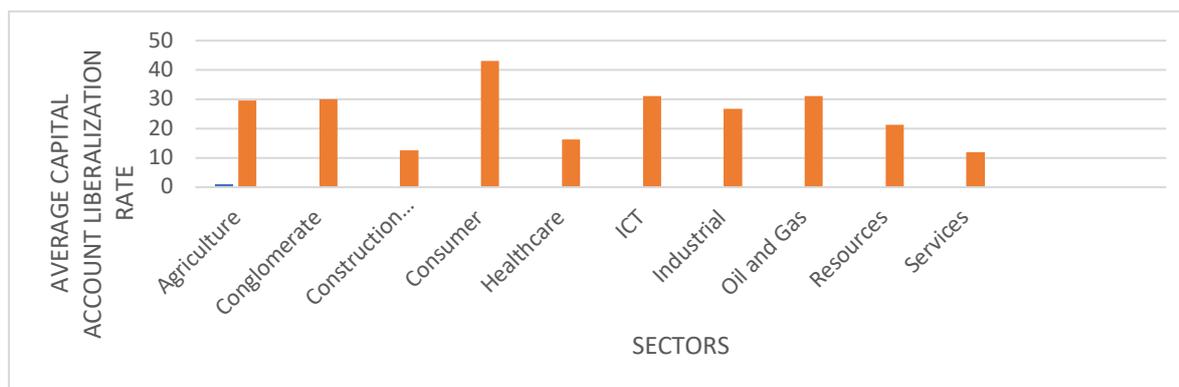


Figure 1. 1. Chart showing the average trend of firms' level of capital liberalization by sector.

Source: (Firm's Annual Reports, 2006 to 2016; SEC Facts Books, 2006 to 2016).

A quick comparison of the above average values and particularly that of the 11 years for the entire firms under each sector show that the consumer sector firms appeared to be more capital opened. This may be due to the importance of consumer goods to Nigerians and the fact that most of the manufactured goods are imported from other developed countries. Next are firms in oil and gas sector then those in the ICT sector followed by the conglomerate firms. The level of capital openness that the ICT firms received could be attributed to the global development in ICT and the recent quest for its advancement in developing countries of which Nigeria is inclusive. Next are the firms in the agriculture sector, then those in the industrial sector. The fact that the oil and gas sector appeared as the second most capital open sector in spite of its massive role in the Nigerian economy could be blamed on the recent global fall in oil price, weak institution, political instability and Boko-Haram insurgency in the Northeast Nigeria that has led most multinationals in that sector to withdraw their funds and even discourage foreign institutions from acquiring equity. Last on the list are firms in the resources sector, then healthcare, as well as services sector. The least group of firms with capital openness are those in the construction and real sector.

### 1.3.2. Trend in firm's investment growth (individual firm and sector bases)

For the period under study, investments growth of firms as computed by growth of long-term asset, fixed asset to total asset or capital stock, non-current asset to total asset and CapEx (capital expenditure) both on individual firms and on sector bases have been highly stochastic with more downward pressure especially for firms that have more foreign share ownership (capital openness) (Firm's Annual Reports for 2006 to 2016; SEC Annual Fact Books for 2006 to 2016). For instance, the firm named Capital oil being the most capital opened one (as seen from its level of capital ownership) among the 80 firms under study, experienced a fall in investment growth.

The Chart below shows the average value of the investment growth rate of the firms under study on a sector bases for the period of 2006-2016.

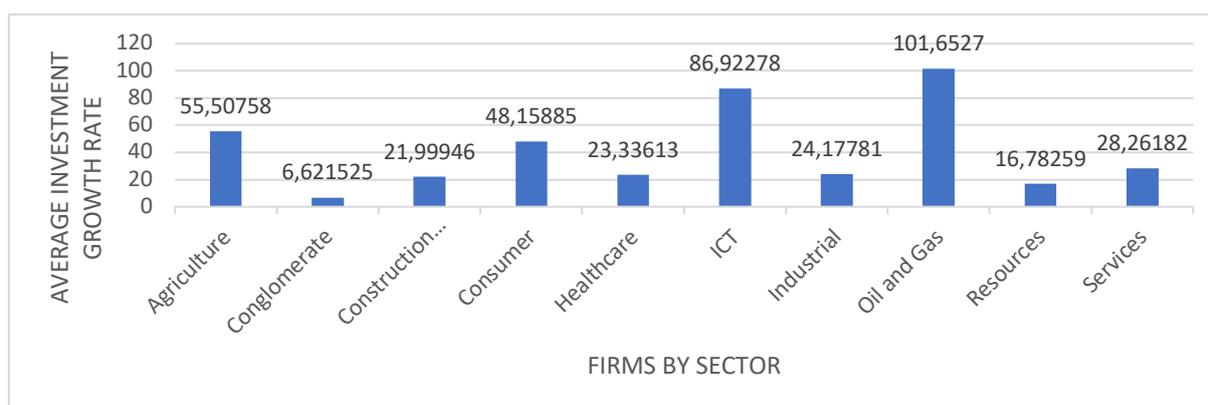


Figure 1.2: Chart showing the average investment growth rate of firms by sector.

Source: (Firm's Annual Reports, 2006 to 2016; SEC Facts Book, 2006 to 2016).

From the sector point of view, as seen in Fig. 1.2, using investment growth as measured by growth of long-term fixed asset, the Oil and gas sector firms have the highest investment growth rate on the average, followed by those in ICT, then Agriculture and consumers sectors while those in conglomerate sector have the least investment growth rate among others which happened to be the less opened.

If we super impose figure 1.1 and 1.2 we will arrive at a graph showing the relationship that runs between capital openness and investment growth of firms as follows:

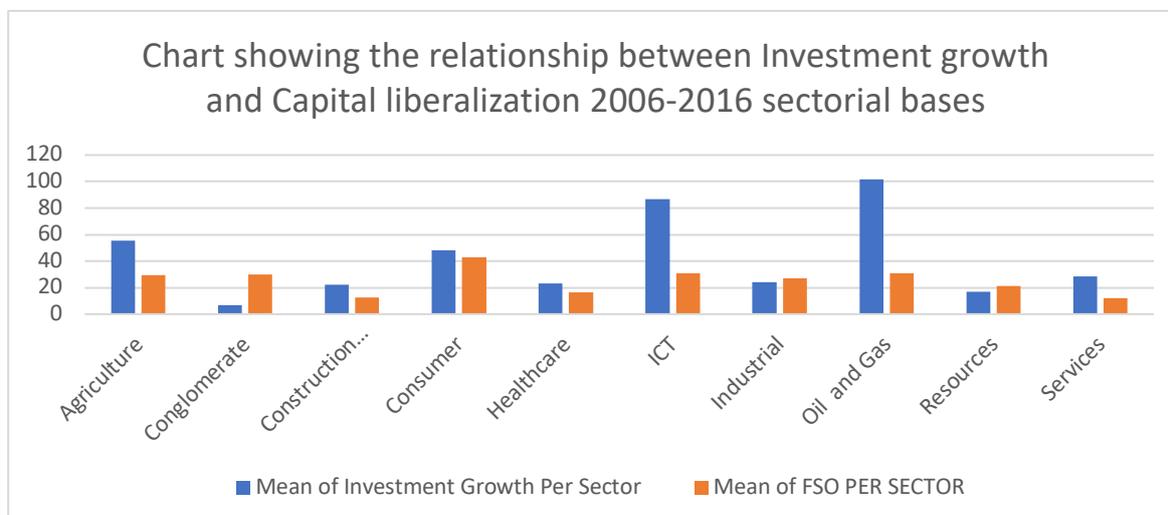


Figure 1.3: Chart showing the relationship between investment growth and foreign institution ownership share to total share.

Source: (Firm's Annual Reports, 2006 to 2016; SEC Facts Book, 2006 to 2016).

From the above chart, we can say that on the whole, firms that are more liberalized experienced more increase in investment although there are some few exceptions with firms under the Conglomerate, industrial and Resources sectors. Following the few exceptions, it's therefore imperative to examine empirically the impact of CAL on investment growth with evidence on firm-level data. It is obvious from the graph above that there exists a positive link between capital account liberalization as measured by the firm-level data, foreign institution ownership (FSO) but the extent to which this holds in the real sector may not be ascertained until after a vivid empirical analysis is carried out.

#### 1.4. Research Hypotheses and their link with Study

Following the background to the study and the literature reviewed, the following null hypotheses are stated as follows:

*H<sub>1</sub>: Increased CAL does not significantly impact on investment growth of the different firm types.*

*H<sub>2</sub>: Firm's investments growth are not sensitive to cash flow for both tradable and non-tradable firms (firms are not financially constrained).*

*H<sub>3</sub>: Increased CAL in the domestic firm does not significantly reduce financial constraints in the different firm type and in turn boosts their investment growth.*

*H<sub>4</sub>: there is no significant difference between the cash flow sensitivity of the tradable and non-tradable firm samples.*

Therefore, investment growth ought to be positively influenced by increased cash flow through capital account liberalization for both samples, cash flow is supposed to be positively related to investment growth of the non-tradable or small and insensitive to tradable or large firms. Consequently, if any sampled firm investment is found to be sensitive to cash flow, we can conclude that such firms in the given sample are financially constrained. Also, increased capital liberalization which leads to increased cash flow is supposed to ease the financial constraints

faced by the non-tradable or small firms or the sampled firm that is experiencing financial constraint. Note that if the interactive term of foreign share ownership (FSO) and cash flow to capital stock variables (CFLOWK) which is denoted as  $[Cflowk_{it} * FSO_{it}]$  is positive or declines a little in magnitude and becomes more significant, it indicates that capital liberalization helps to reduce the level of financial constraints of the firm type.

Again, all things being equal. Non-tradable firms may appeared to be highly financially constrained since they have little or no access to external cash flows, supposed this is also the case for tradable firms which ought not to be since they appear to have access to external fund through inflows and export potentials, we can compare the level of sensitivity between both samples to find the firm type that is more financially constrained. In this case, if cash flow variable appears to be very sensitive to investment growth of any firm type, we can conclude that such a firm type is more financially constrained than the other.

## 2. Methods

### 2.1. Theoretical Framework and Model Specification

#### 2.1.1. Theoretical Framework

The study hinges on the extended version of the traditional Tobin's-q model as advanced by Chari and Henry (2003) and a further extension by Okungbowa (2021).

According to them, prior to capital account liberalization, the basic firm level investment equation appears like thus:

$$\left(\frac{I}{K}\right) = \alpha + \beta q_i \quad (1)$$

Where  $\alpha$  and  $\beta$  are positive constants and  $q$  is Tobin's q- ratio. The intention of equation 1 is to arrive at an expression of the form below following openness.

$$\Delta \left(\frac{I}{K}\right) = \alpha + \beta \Delta q_i \quad (2)$$

$\Delta q_i$  represents a change in Tobin's q-value that will take place following liberalisation of capital account.  $q_i$  is the ratio of the market value of the capital to the replacement cost of firm's capital stock in the goods market.

$$q_i = \frac{M_i}{Pl_i K_i} \quad (3)$$

By standard normalization, *taking*  $Pl_i = 1$ , then we will arrived at the normal textbook expression for Tobin's q-value (Obstfeld and Rogoff, 1996):

$$q_i = \frac{M_i}{K_i} \quad (4)$$

Assuming that the domestic firm is financed wholly by domestic equity, then the market value of the capital of the firm will be equal to the stock market value of its equity. A further assumption that  $r$  is the risk-free interest rate in the domestic economy and that firms generate volatile earnings stream,  $\tilde{A}_i$ , which is expected to grow at the rate,  $g_i$  in perpetuity. From the above assumptions, it follows that the stock market value of the firm will be:

$$M_i = \frac{\tilde{A}_i}{[r + \theta_i - g_i]} \quad (5)$$

Where  $\tilde{A}_i$  is the expected value of  $\tilde{A}_i$ , and  $\theta$  is the risk premium needed to hold a share of firm i's stock. If we substitute this into the  $q_i$  (Tobin's q) expression will be:

$$q_i = \frac{\tilde{A}_i}{K_i [r + \theta_i - g_i]} \quad (6)$$

Suppose we relax the assumption of a closed economy and assume that the stock market opens up, this will cause a fundamental change in the firm investment level through the determining factors of the stock market prices such

as interest rate, risk premium and the growth rate of earnings. So, the domestic values of these fundamentals will change to the world values as  $r^*$ ,  $\theta^*$ , and  $g^*_i$  consequently, the Tobin's-q model will change and look thus:

$$q_i^* = \frac{\bar{A}_i}{K_i[r^* + \theta_i^* - g_i^*]} \quad (7)$$

The basic firm level investment model will change following capital account liberalization, and appear as:

$$\Delta \left( \frac{I}{K} \right) = \lambda_i [r - r^*] - \gamma DCOV_i + (g^*_i - g) \quad (8)$$

Where:  $r - r^*$  is aftermath of liberalization, the benchmark risk-free rate for determining the hurdle rate for individual investment project changes from  $r$ , the closed economy rate to  $r^*$ , the world risk-free rate.  $\lambda_i$  Is the firm-specific scaling factor that has some technical implications for empirical estimation.  $DCOV_i$ - this term shows the firm-specific change in investment that occur following liberalization is inversely related to the change in the equity premium.  $DCOV_i = \theta - \theta^* g^*_i - g$  - this term shows that a change in an investment of a firm after liberalization will depend positively on the change in its expected future growth rate of earnings. Okungbowa (2021) further extended the above model by replacing  $r - r^*$  with  $CAL$  thereby employing the use of the actual inflow of capital following openness rather than its cost of capital outcome on investment and included the investment growth rather than investment level.

## 2.2 Model Specification and Data Type/Sources

The models specified for this study are based on the Tobin's q-model and its modified versions by Chari and Henry (2003), the ideas of Mody and Murshid (2005); Leaven (2000); Lee (2003); and Barimah (2010) and the further extension in the area of investment growth and indirect route via interaction (Okungbowa, 2021). The functional model is given as:

$$INVESTG_1 = f(FSO, X, Z) \quad \text{-----} \quad (9)$$

Where:  $INVESTG_1$  is the growth of long term assets,  $FSO$  is the firm-level measure of  $CAL$ , the domestic ownership of 5% and above own by foreign institution or the share of foreign institutional ownership of domestic investment to total shares, while  $X$ , and  $Z$  are vector of other macro and micro control variables that influence domestic investment as identified in the literature. The dynamic panel models to analyze the impact of capital account liberalization on firm-level investment growth following the Arellano and Bond (1991) estimator for both samples are as follows:

$$Investg_{it} = \beta_0 + \beta_1 Investg_{it-1} + \beta_2 SalesK_{it} + \beta_3 Cflowk_{it} + \beta_4 FSO_{it} + \sum_{i=1}^I \alpha_i Z_{it} + \sum_{j=1}^J \phi_j X_t + \mu_{it} \quad (10)$$

We specified model 11 with an inclusion of an interactive term of  $FSO$  and  $CFLOWK$  denoted as  $[Cflowk_{it} * FSO_{it}]$  to determine the role of capital/credit availability (cash flow) on  $CAL$ -investment growth nexus.

$$Investg_{it} = \beta_0 + \beta_1 Investg_{it-1} + \beta_2 SalesK_{it} + \beta_3 Cflowk_{it} + \beta_4 FSO_{it} + \beta_5 [Cflowk_{it} * FSO_{it}] + \sum_{i=1}^I \alpha_i Z_{it} + \sum_{j=1}^J \phi_j X_t + \mu_{it} \quad (11)$$

## 2.3 Data Types and Sources

This study employed a firm-level panel data for the periods of 2006 to 2016 for 80 non-financial listed firms in the Nigeria Stock Exchange Market that was further disaggregated into 44 Tradable firms drawn from agriculture, industrial, oil and gas, consumer, and conglomerate sector and 31 non-tradable firms drawn from construction and

real, services, healthcare, resources, and ICT sectors. The grouping of firms was based on firm's ability to access and attract external capital either by exporting or having potentials to export its products. The choice of the number of firms was based on availability of data. The firm-level data used for this study were sourced from the various volumes of the Annual Reports of the firms, Security and Exchange Commission's (SEC) Annual Facts Book. While the macro control variables data were extracted from the World Bank's World Development Indicators, various volumes of the Central Bank of Nigeria's Statistical Bulletin and National Bureau of Statistics' publications.

#### 2.4 Estimation Technique

This study employed the differenced Generalized Methods of Moment (GMM) with instrumental variables (IV) regression as advanced by Arellano and Bond (1991) and a dynamic panel data (DPD). This approach appears to be more appropriate for this analysis following its ability to correct any endogeneity problems, its ability to explore the previous year's effect of the dependent variable on its current value and the fact that that the model has short time series, T (11 years) and large cross-section, N (44 tradable firms and 31 non-tradable firms).

### 3. Results

#### 3.1. Dynamic Panel Regression Results on Investment Growth

The dynamic panel data regression results for the, non-tradable and tradable samples obtained, are presented in Tables 1 and 2 below:

Table 1: Dynamic Panel Regression Result for the Non-Tradable Firms with DEPENDENT VARIABLE as investment growth (INVESTG1)

Variables	Direct channel model (Model 10)		Indirect channel model (Model 11)	
	One-step	Two-step	One-step	Two-step
Investg1 <sub>t-1</sub>	-.3056* [0.001]	-.3066* [0.001]	-.3365* [0.006]	-.3380* [0.005]
Fso	.8647 [0.693]	1.258 [0.608]	.6358 [0.767]	.4511 [0.822]
Cflowk	16.419*** [0.06]	16.449*** [0.059]		
Rgdp	549.8 [0.403]	457.7 [0.421]	760.02 [0.290]	675.71 [0.376]
Fsize	400.35** [0.041]	377.58** [0.036]	363.9** [0.050]	356.9*** [0.074]
Bsize	-60.990 [0.283]	-68.048 [0.270]	-57.636 [0.263]	-56.243 [0.331]
Cflowk_fso			.4075** [0.017]	.4093** [0.013]
AR(1)	-1.42 [0.155]	-1.84 [0.066]	-1.40 [0.161]	-1.64 [0.100]
AR(2)	-0.02 [0.987]	-0.06 [0.951]	0.44 [0.663]	0.42 [0.673]
Sargan-Hasen	24.54 [0.966]	24.54 [0.966]	28.81 [0.884]	28.81 [0.884]
Difference-in-Hansen tests	24.34 [0.946]	24.34 [0.946]	26.28 [0.905]	26.28 [0.905]
Exogeneity Test	0.20 [0.904]	0.20 [0.904]	2.52 [0.283]	2.52 [0.283]
F-TEST (4)	4.26* [0.003]	4.46* [0.002]	4.22* [0.003]	3.58* [0.008]
No. of Instruments	45	45	45	45
No. of Observations	199	199	199	199

Source: Authors' computation Note: (a) items in bracket [ ] represents p-values (b) \*\*\*=Significant at 10%; \*\* = Significant at 5%; \*, Significant at 1%.

Table 1 shows the results of the direct and indirect channel models. Each of the models was estimated with the two approaches (one-step and two-step). Based on the coefficients of the F-statistic, the one-step approach with robust standard error appeared to be more appropriate for the direct channel model while the two-step approach was more appropriate for the indirect channel model under the non-tradable firm analysis. The estimated result from the direct channel model as seen under the two-step approach indicates that the coefficients of foreign share ownership (fso), that is, the firm-level measure of capital account liberalization and the level of cash flow of firms (CFLOWK) met the a-priori expectations. FSO appeared to be direct and statistically insignificant. This signifies that an increase in the capital openness reform leads to an upshot in the investment growth of the non-tradable firms by 1.258 percent. This confirms economic theory, but negated statistical theory. CFLOWK coefficient was positive and statistically significant at 10% in driving investment growth of non-tradable firms by 16.449 percent. Following the huge magnitude of the cash flow coefficient which shows that cash flow appears very sensitive to investment growth, it suggests that the non-tradable firms are highly financially constrained due to information asymmetry problem in the capital markets and lack of access to external funds. Based on the coefficient of the F-statistics with its probability value (p-value) (0.002) which suggests a 1% level of significance, it can be said that the model has a well performed goodness of fit and as such, we can conclude that a linear relationship exists amid the dependent variable and all the independent variables combined. Also, we can conclude that the model is free of serial correlation problem since at least one out of the two Arellano and Bond first difference autocorrelation tests (that is, the first order and second order) show that in the model, serial correlation problem was not noticed. So, we accept the null hypothesis of no autocorrelation following the high p-value of the second order test given as (0.957). Following the Sargan-Hansen over-identifying restriction validity test result above, we can conclude that the instruments are valid as the p-values are greater than 0.05, also the difference-in-Hansen test shows that the dynamic model is valid as the null hypothesis which says the model is not strictly exogenous was accepted following the high p-value of 0.904. From the one-step approach in the indirect channel model, the coefficient of the interactive term, (cf\_lowk\_fso) which was used to measure the role of Cash flow on CAL-Investment nexus and the rate at which CAL assists in reducing the financial constraint faced by firms. The result is positive and statistically significant at 5% level for the non-tradable firms' sample. This, therefore, implies that in the face of capital liberalization, CAL plays a vital role of easing the financial constraints faced by firms and in turn boosts their investment growth. This supports the indirect route of CAL-investment growth nexus. The above conclusion is based on the drop in the magnitude of the coefficient of cash flows after the interaction compared to its value before interaction, and the 5% level of significance of the coefficient of the interacted term which is an improvement over the cash flow and FSO prior to their interaction. The F-statistics value and probability value (p-value) of (0.003) suggesting a 1% level of significance, also suggests well performed goodness of fit for the second model under this sample. The Arellano and Bond first difference autocorrelation test at order one and two show that there is no serial correlation in the model since the negative hypothesis of no autocorrelation were accepted with the high p-values (0.161 and 0.663).

Table 2: Dynamic Panel Regression Result for the Tradable Firms with DEPENDENT VARIABLE as INVESTG1.

Variables	Direct channel Model (Model 10)		Indirect Channel Model (Model 11)	
	One-step	Two-step	One-step	Two-step
Investg1 <sub>it-1</sub>	-.4631* [0.000]	-.4623* [0.000]	-.4653* [0.000]	-.4651* [0.000]
Fso	-.0292 [0.990]	.2278 [0.924]	-.8233 [0.718]	-.6453 [0.803]
Cflowk	3.042** [0.024]	3.078** [0.028]		
Salesk	-344.33*** [0.077]	-345.20*** [0.081]	-363.1** [0.05]	-365.2*** [0.056]
Rgdp	-2652.9*** [0.068]	-2480.1*** [0.070]	-2663.3*** [0.06]	-2617.4*** [0.053]
Fsize	474.12** [0.035]	461.99** [0.050]	452.7** [0.037]	444.4*** [0.053]

<b>Bsize</b>	<b>-154.75 [0.213]</b>	<b>-150.93 [0.211]</b>	<b>-148.2 [0.226]</b>	<b>-146.15 [0.253]</b>
<b>Cflowk_fso</b>			<b>.0463** [0.018]</b>	<b>.0458** [0.020]</b>
<b>AR(1)</b>	<b>-1.58[0.115]</b>	<b>-1.51[0.130]</b>	<b>-1.56 [0.118]</b>	<b>-1.49 [0.136]</b>
<b>AR(2)</b>	<b>-0.99[0.320]</b>	<b>-1.15[0.251]</b>	<b>-0.99[0.321]</b>	<b>-1.15[0.248]</b>
<b>Sargan-Hasen</b>	<b>38.91[0.608]</b>	<b>38.91[0.608]</b>	<b>37.61 [0.664]</b>	<b>37.61 [0.664]</b>
<b>Difference-in-Hansen tests</b>	<b>38.59[0.534]</b>	<b>38.59[0.534]</b>	<b>53.40[0.677]</b>	<b>53.40[0.677]</b>
<b>Exogeneity Test</b>	<b>0.31[0.855]</b>	<b>0.31[0.855]</b>	<b>2.22[0.330]</b>	<b>2.22[0.330]</b>
<b>F-TEST (4)</b>	<b>78.77*[0.000]</b>	<b>69.55*[0.000]</b>	<b>83.44* [0.000]</b>	<b>82.07* [0.000]</b>
<b>No.of instruments</b>	<b>49</b>	<b>49</b>	<b>49</b>	<b>49</b>
<b>No. of Observations</b>	<b>291</b>	<b>291</b>	<b>291</b>	<b>291</b>

Source: Author's computation; Note: (a) items in bracket [ ] represent p-values (b)\*\*\* = Significant at 10%; \*\*, = Significant at 5%; \* = Significant at 1

Table 2 shows the results of the direct and indirect channel models, for the tradable firms. The estimated result from the direct channel model as seen under the two-step approach indicates that the coefficients of foreign share ownership (fso), that is, the firm-level measure of capital account liberalization also met the expected sign and appeared to be statistically insignificant in the case of the tradable firms. This implies that an increase in the capital openness reform directly may cause a rise in the investment growth of the tradable firms by 0.2278 percent. This speaks of the fact that CAL may likely encourage capital inflows for firms that are already exposed to external funds through exportation of goods. CFlowk coefficient was positive and statistical significant at 5% in driving investment growth of the firms in question by 3.078 percent. The positive coefficient showed that cash flow appeared sensitive to investment growth, and as such tradable firms are financially constrained due to information problems in the capital markets and lack of access to external funds. This result is somewhat striking as such firms ought not to be financially constrained since they already have access to external funds. However, when we compared the magnitude of the tradable cash flow coefficient of 3.078 to that of non-tradable firms which is 16.419 and their levels of significant of 5% and 10% respectively, it therefore suggests that the tradable firms are less financially constraint compared to the non-tradable firms. The sales variable (salesk) showed an inverse and statistically significance relationship between sales volume of the firms and their investment growth. This is in contrast with common results in the literature, as the result suggests that higher sales volume of a firm retards investment growth. Judging from the F-statistics, it can be said that the model has a satisfactory 'goodness of fit' and as such, we can conclude that a linear relationship exists between the dependent variable and all the independent variables. We can concluded that the model was free of serial correlation problem since the two Arellano and Bond first difference autocorrelation tests (that is, the first order and second order) show that serial correlation problem did not surface in the model. So, we accept the null hypothesis of no autocorrelation following the high p-values of the first and second order test given as (0.130) and (0.251).

From the indirect channel model, the coefficient of the interactive term, (cflowk\_fso) which was used to measure the rate at which CAL helps to reduce firm's financial constraint was positive and statistically significant at 5% level for the tradable firms' sample. This, therefore, implies that increased foreign share ownership has great implication for easing of the financial constraints and boosting of investment growth of firms. This shows that capital openness plays an indirect role of reducing of firms' financial constraints and in turn boosts their investment growth. The above conclusion is based on the drop in the coefficient of cash flows after the interaction compared to its value before interaction, and the 5% level of significance of the coefficient of the interactive term which was an improvement over the cash flow and FSO prior to when they were not interacted. Judging by the coefficient of the F-statistics with probability value (p-value) (0.000) which suggests a 1% level of significance, it can be said that the model has a well performed goodness of fit and as such, we can conclude that a linear relationship exists amid the dependent variable and all the independent variables combined. The Arellano and Bond first difference

autocorrelation test at order one and two show that there is no serial correlation in the model since the null hypothesis of no autocorrelation was accepted with the high p-values (0.136 and 0.248). For both samples, the speed of adjustment which represents the lagged dependent variable's coefficient (*Investg1it-1*) shows a negative and a 1% level of significance. *The relevance of the lagged investment growth confirms the existence of a dynamic adjustment process towards a target level. The inverse relationship between the lagged dependent variable and the dependent variable in both samples show that the past period investment leads to a decline in the current level investment but it appears very vital in driving investment growth.*

#### 4. Discussion

Regarding the impact of cash flow, capital account liberalization on investment growth of sampled firms in table 1 and 2, the results show that some the variable met the expected sign and some were also statistically significant these thus corroborating the results from earlier papers (Okungbowa, 2021; Chari & Henry, 2003; Shrestha & Chowdhury, 2005; Alfaro & Charlton, 2006; Noy & Vu, 2007; Asiedu & Gyimah-Brempong, 2008; Sarode, 2012; Okada, 2013; and Mouna & Mondher, 2015). But, they contrast the results of (Bascom, 1994; Montiel & Reinhart, 1999; Lee, 2003; Asiedu & Lien, 2004; Bankole & Ayinde, 2014; Adegbite & Adetiloye, 2013; and Foong & Lim, 2016).

Next is to discuss the results in Table 1 and 2 with respect to the stated hypotheses:

*Hypotheses 1: Increased CAL does not significantly impact investment growth of the different firm types.*

Following the statistical insignificant results of the foreign share ownership for both the Non-tradable and tradable firms samples, *we accept the above hypothesis which states that increased foreign share ownership that (CAL) does not significantly impact investment growth of firms.*

*Hypothesis 2: Firm's investments growth are not sensitive to cash flow for both tradable and non-tradable firms (firms are not financially constrained).*

*Cash flow (CFlowk) coefficient was positive and statistical significant at 10% in driving investment growth of the firms in both samples by 16.449 and 3.042 units for both non-tradable and tradable samples respectively. Following the huge magnitude of the cash flow coefficients which show that cash flow appears to be very sensitive to investment growth, it suggests that Nigeria firms are financially constrained. This appeared to be profound for the non-tradable firms and this is attributed to information asymmetry problems in the capital markets and lack of access to external funds. Based on that we reject hypothesis 2 which says that firms (non-tradable and tradable) are not highly financially constrained.*

*Hypothesis 3: Increased CAL in the domestic firm does not significantly reduce financial constraints in the different firm type and does not in turn boost their investment growth.*

From the one-step approach, the coefficient of the interactive term, (cflowk\_fso) which was used to measure the rate at which CAL will help to reduce the firm's financial constraint was positive and statistically significant at 5% level for both sample. This, therefore, implies that CAL through increased foreign share ownership has great implication for reducing the financial constraints and boosting investment growth of firms. This revealed that capital openness plays an indirect role of reducing of firms' financial constraints and, in turn, boosts their investment growth. As a result of this, *we rejected hypothesis 3 which states that increased CAL does not significantly reduce the financial constraints in non-tradable firms and does not boost their investment growth.* The above conclusion is based on the drop in the magnitude of the coefficient of cash flows after the interaction compared to its value before interaction, and the 5% level of significance of the coefficient of the interacted term which is an improvement over the cash flow and FSO prior to when they were not interacted. This indirect channel result supports those of (Fazzari et al., 1988; Evans & Jovanovic, 1998) and negates Barimah, (2010) whose result did not support the hypothesis that financial/capital openness can ease off the financial constraint faced by Ghanaian firms.

*Hypothesis 4: there is no significant difference between the cash flow sensitivity of the tradable and non-tradable firms sample.*

Judging by the magnitude of their cash flow coefficients for the two samples, non-tradable firms were found to be more severely financially constrained. As such Cash flow sensitivity to Investment growth-CAL nexus happens to be more profound for non-tradable firms. So we reject hypothesis 4 that says that there is no significant difference between the cash flow sensitivity of the tradable and non-tradable firms.

## 5. Summary of Findings, Recommendations and Policy Implications

In sum, the study found the following, first for both tradable and non-tradable firm samples, cash flow was found to be highly sensitive to firms' investment growth. A situation that implies a profound financial constraint among firms of both samples. This ordinarily ought not to be the case for tradable or big firms due to their capacity to access external funds. However, when we compared the level of financial constraint between the two samples, judging by the magnitude of their cash flows coefficients, non-tradable firms were found to be more severely financially constrained. Second, CAL appeared to be sensitive to investment growth for both firm types through the indirect (cash flow) channel. Third, investment growth-CAL nexus appears to be more sensitive and significant with cash flows. This was profound for the non-tradable firms' sample. Hence, we concluded that the level of capital openness is still not enough or properly channeled to abate financial constraints that firms face in Nigeria. This anomaly was found for tradable firms too. Consequently, the study recommends amongst others that, capital openness should be intensified and channeled rightly so as to encourage more capital inflows that will help to reduce financial constraints from the firms particularly the non-tradable firms which appeared to be more financially constrained and whose investment growth responded more profoundly to liberalization, the relevant government agencies should intensify efforts toward enhancing capital inflows to firms generally irrespective of their sizes; and lastly, government should discourage all forms of post-liberalization capital restriction syndrome that are prominent among the small or non-tradable firms due to market imperfections and corporate governance bottle necks.

Looking at the outcome of this study in that firms in both tradable (large) and non-tradable (small) samples were found to be faced with financial constraints. This ought not to be so for especially in the case of large firms. This led to the recommendation of further capital opening with caution, there will be need for future researchers to carry out some threshold analysis on both samples as aggregated and disaggregated to know the extent of openness that will impact investment growth of the firms in question so as to advise as appropriate. Again there will be need to examine other channels through which investment growth will be sensitive and financial constraint will be eased off in the face of capital openness other than cash flow channel

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