
Financial Liberalization and Access to Finance: The Case of Manufacturing Firms in Nigeria (2007-2014)

Ahmad, D.^a and Premaratne, S.P.^b

^a *Faculty of Graduate Studies, University of Colombo, Sri Lanka*

yahyaadamdanjuma@gmail.com

^b *Department of Economics, University of Colombo, Sri Lanka*

spp@econ.cmb.ac.lk

Abstract

The study examined the impact of financial liberalization on Nigerian manufacturing firms' access to finance, using firm-level data of 3801 manufacturing firms from World Bank Enterprise Survey from 2007-2014. Although, cross-country literature extensively discussed on the effect of financial liberalization on credit constraints, the studies significantly overlooked the Nigerian case. To achieve this goal, the current research developed a model, based on the New Keynesian Theory of Credit Constraints and categorized the firms into four different constrained groups. The result indicates that financial liberalization reduces the probability of being credit constrained, with the strongest effect for Deterred Investors and Active Investors. Increase in the degree of liberalization decreases the probability of being credit constrained by between 2 and 3 percent depending on the constraint definition. Furthermore, the result also provides evidence indicating that firms are new to use financial system; New Entrants, which do not benefit from financial liberalization. Thus, this points to the relevancy of information asymmetry in the Nigerian financial market a significant factor exacerbating market imperfection especially in the developing countries. Such effect of financial liberalization on financial constraints can be linked to weak institutional environment.

Keywords: *Credit constraint, Financial liberalization, Nigeria, Probit model*

1. Introduction

Nigeria has been struggling towards achieving financial development by liberalizing the financial market. McKinnon (1973) and Shaw (1973) have earlier postulated this strategy and recent studies have supported, promoted and stressed the underlying role of finance in fostering economic growth (King and Levine, 1993; Levine, 1997; Levine, 2005; Levine, Loayza & Beck, 2000). The fundamental theme in this literature postulates that financial liberalization leads to financial development, which in turn gives rise to economic growth. There are number of channels through which financial reform benefits the economy (Lee, 2006). One important channel is through improved access to finance (Ang, 2010), which in turn, leads to higher and more efficient investment (Guermazi, 2014). By facilitating better access to credit, financial liberalization allows credit constrained firms to obtain significant funds with which capital investment plans can be undertaken (Beck, et al., 2006; Galindo, Schiantarelli, & Weiss, 2007; Gelos and Werner, 2002; Haramillo, Schiantarelli & Weiss 1996; Love, 2003). Despite financial reform measures in Nigeria, access to finance remained the most challenging obstacle to enterprise development in country. According to World Bank enterprise survey (2014) 58% of the Nigerian manufacturing firms report access to finance as their main obstacle to invest.

Understanding how financial liberalization affects firms' access to finance is however, far from complete, mainly due to the complex, multi-dimensional and multifaceted nature of financial reforms. If information asymmetry is endemic in the financial market, there is no reason to think that financial liberalization would ease access to finance at least for some group of firms. This research builds on the existing literature in evaluating the effect of financial liberalization on Nigerian manufacturing firms' access to finance. Thereby, an index of financial liberalization is constructed using data from Central Bank of Nigeria (2018). The index is then mapped to firm level data from the World Bank Enterprise Surveys (WBES).

The contribution of the research is as follows: The study improves the country coverage as compared to existing research that use small number of firms (Ajide, 2017; Obamuyi, 2009; Obokoh and Asaolu, 2017). Secondly, with a view to both capturing the multifaceted nature of financial liberalization, the index constructed covers, in as much depth as possible. Using the financial liberalization index improves upon the work that evaluates liberalization using a single or limited number of policy dimensions (Gezici, 2007). Thirdly, similar to Kuntchev et al., (2014) and O'Toole (2014), four different measures of credit constraints are developed. These indicators move away from existing studies which identify credit constraints using investment-cash flow sensitivities (Guermazi, 2014; Gelos and Werner, 2002; Koo and Maeng, 2005; Koo and Shin, 2004) or perception measures of finance as an obstacle to growth (Beck et al., 2004; Clarke et al., 2006; Love and Mylenko 2003). The estimation strategy uses an instrumental variables (IV) probit model with bribery dummy as instruments.

The results indicate that financial liberalization reduces the probability of being credit constrained across three of the constrained definitions. The estimated coefficients on financial liberalization are negative and statistically significant using both standard probit and IV probit techniques. The result to some extent indicate improvements in the overall level of financial market liberalization especially deepening and widening of the credit market improves. Despite this, however, financial liberalization is unable to remove the problem of information asymmetry, supporting the hypothesis that the policy prescription of financial liberalization is incomplete especially in developing economies like Nigeria where the financial market is characterized by oligopolistic and cartelized market structure. Hence, the prevailing weak institutional environment in the country might be the hindrance of financial liberalization reform from fostering an inclusive finance where both new, small and medium firms can get access to external finance.

1.1. Financial Liberalization and Credit Constraints in Nigeria: An Overview

Liberalizing the financial market has been a long-held believe that it would encourage better savings mobilization and greater allocative efficiency of capital. The expectation is that liberalization reform would eliminate inefficiency in financial intermediation and foster greater depth and wide of the financial market. Through financial deepening, access to finance would be enhanced, and this would bring impressive economic achievements for the nation.

However, recently, the financial system capacity to finance economic activities weakens. For example, in 2010, there has been a decline in the ratio of the core private sector to non-oil GDP in the country by 17-percentage point to 48.1 percent attributed largely, to the failure of financial intermediation (CBN, 2011). Similarly, in 2017 banking system claims on the private sector (including state, local government and non-financial public enterprises) grew by 1.4 percent as compared to 17 percent in the preceding year. Due to this development, credit to core private sector declined by 1 percent. Preliminary investigation shows that despite decline in claims on the federal government, growth in credit to core private sectors remained insignificant (CBN, 2017). Decade after the financial system reforms, indicators of financial development trended largely downwards. For instance, the ratio of M_2 to GDP declined to 20.3 percent in 2017 as against 23.2 in 2016. Banking system capacity to finance economic activities represented by aggregate credit to GDP ratio fell to 23.3 percent from 26.5 percent in 2016.

Although, it has been acknowledged that the Nigerian banking system's ability to finance real activities grew stronger shortly after the financial reforms of 2005. However, it was not clear if the growth translated to alleviate credit constraints of the private firms in the economy. According to IMF (2013), there was a high growth rate of credit to the private sector in Nigeria

during the year 2008, but most of the expanded credit used for speculative transaction, in many cases for the purchase of the stocks of domestic commercial banks that were extending the credit. When the equity bubble burst, NPLs rose from 6 percent to 28 percent of total loans in December 2009. As a result, ten banks, were particularly, hit because of their large exposure to equity-related loans.

Domestic financial market stimulates new business startups by providing the opportunity to access sufficient finance for their business. In Nigeria, activities at the firm level show a slow-down of the business environment in the recent years. Nigeria is one of the countries in the world that prospective businesses find it difficult to set up business. According to the Doing Business Index of World Bank (2017), Nigeria has an unhealthy business climate that reflected by the economy's relative low rank to comparator economies.

2. Literature Review

Different studies suggest number of channels through which financial liberalization affect the economy. Goldsmith (1969) for example pointed out that the discernible channel is through efficient allocation of capital. Other studies look on efficient allocation of savings to investment as well as the effects it has on return to savings (McKinnon, 1973; Shaw, 1973). Based on these perspectives, investment is therefore, affected both quantitatively and qualitatively. The policy implication of this argument is that, deregulating financial market will make real interest rate to adjust to the equilibrium. Thereby, unproductive projects will give way, while productive and profitable ones will be enhanced. In other words, there will be efficient allocation of capital resources. Furthermore, the increase in the real interest rate will stimulate savings and consequently increase the overall total supply of credit in the economy.

Jerzmanowski (2017) also identified channels through which financial liberalization boost economic growth. These include improve in allocation of capital, increase in savings mobilization, greater diversification of investment risk, overcoming the problem of indivisibility of large capital projects, enhance monitoring and management discipline, and facilitate entry of new firms, increase innovation and competition among the existing ones. In the neoclassical approach to financial market, allowing market to price assets in line with the market fundamentals will make such market more efficient. In addition, if there is constraint associated to finance any productive project, that should be considered as a symptom of malfunctioning emanated not from the financial system itself, but from the economy at large (Hermann, 2014).

Most of the literature pertaining to firms' financial constraint in a liberalized financial economy is that of New Keynesians. Their model recognized the significance of market imperfection in

explaining why credit allocation to firms is constrained due to presence of information asymmetry and principal-agent relationship (Gelos and Werner, 2002; Guermazi, 2014; Koo and Maeng, 2005). The theoretical model considers negative relationship between firm's profitability and external funds. Beck et al., (2006) specifically show that firms' size, ownership structure and age are also important determinants of firm financing constraint. Their study shows that older, larger and foreign-owned firms are less financially constraint than their counterparts. In addition, they also find that financial development significantly reduces financing constraint. Similarly, Ferrando and Mulier (2015) investigate the role of firm characteristics on financing constraints using firm level data of Euro-area. Unlike Beck et al., (2006), Ferrando and Mulier (2015) distinguish between perceived and actual credit constraints as reported by the firms. The authors show that indicators of asymmetric information such as firm size and age are important determinants of credit constraints, stressing that the probability measures are more robust than the balance sheet measures in explaining credit constraints. Another important factor in the literature that determines credit constraint is employment growth. This is because financial institutions mainly lend only to growing firms. Ayyagari et al, (2016) examined this relationship using firm-level data from 70 developing countries. The result finds a strong positive relationship between access to finance and employment growth.

On the other hand, Gelos and Werner (2002) examined the impact of financial liberalization on fixed investment of manufacturing firms in Mexico using establishment-level data for the period 1984 to 1994. To test the presence of credit constraint, they categorize the firms into very small, small, medium and large and find that financial liberalization eased financing constraints for the smaller firms. The finding of Guermazi (2014) using sample Tunisian manufacturing firms was similar to that of Gelos and Werner (2002). They both show that financial liberalization ease firms access to credit. In other words, the reform relaxes credit constraint virtually for all the firms observed with the exception of few that were not already facing such credit constraints and as such, the liberalization reform does not affect their operations. Similarly, Koo and Maeng (2005) further argued that financial liberalization reduces cash flow sensitivity to investment particularly for smaller and non-chaebol Korean firms.

With respect to Nigeria, Obamuyi (2009) use 300 sample of manufacturing firms to investigate the impact of financial liberalization on private sector development. The study shows that financial liberalization does not improve financial constraints of the manufacturing firms. Similarly, Obokoh and Asaolu (2012) by using a sample of 50 manufacturing firms in Nigeria they show that financial liberalization does not relaxes financing constraints of the firms examined. While there are some evidences from cross-country studies showing positive impact of financial liberalization on manufacturing firms' access to finance, the Nigerian experience is

quite different. Methodological approach and differences in measuring credit constraints could account for the discrepancy.

While most of the cross-country studies use the balance sheet approach to measure the sensitivity of investment to cash flow (Gelos & Weaner, 2002; Guermazi, 2014), the studies from Nigeria use macro indicator usually private sector credit as a ratio of GDP to measure credit constraints (Obamuyi, 2009). This indicates that the relationship between financial liberalization and access to finance is far from understanding. Hence, there is need to investigate further, on the relationship. This study builds on the existing argument however, using different approaches used by the afore-mentioned studies, to examine the impact of financial liberalization on Nigerian manufacturing firms' access to investment finance. Firstly, the study improved on the sample size used by both Obamuyi (2009), and Obokoh and Asaolu (2012). Secondly, the study used direct firm-level measures of credit constraints rather than the balance sheet or country-level proxy of credit constraint used by the previous studies.

3. Methodology

The study adapts the model of credit constraints similar to O'Toole (2014) to examine the effect of financial liberalization on credit constraints. The study is a firm-level analysis and the data sample is mainly at the firm level, with the proxy of financial liberalization at the country-level. Data were sourced from the World Bank Enterprise Survey and Central Bank of Nigeria statistical bulletins. The sample contains only manufacturing firms and excludes service and construction firms. The sample period covers from 2007 to 2014. The full sample of the Manufacturing firms in the enterprise survey data is 3801.

To achieve the objectives, firms were classified into four constrained groups using four questions similar to the work of (Byiers et al., (2010); Hansen and Rand, (2011) and O'Toole, (2014)). Unlike Hansen and Rand (2011), we did not consider firm perception as credit constraint as this might likely lead biasedness in managers' opinion. The first question identifies the relative constraints of the firms. The second question asks firms who did not apply for loans and the reason for not applying. In line with O'Toole, (2014), and Hansen and Rand (2011) if firm answered that the interest rate offer was not favorable, that firms is classified as unconstrained. The third question asks whether the firm has access to a formal line of credit (either a loan facility or a line of credit to smooth working capital) or not. The fourth asked firms whether, they have purchased any fixed assets and if they did, how did they structured their investment finance. Identifying these four categories of credit-constrained firms should cater for the heterogeneous nature of firms' interaction with financial markets and both intra-industry variation in the degree of credit constraints and provide a platform that will

adequately assess the multifaceted and multidimensional aspects of financial reform and how it affects businesses on the ground. Table 1 shows the four constrained categories.

Table 1: Measures of Credit Constraints

	General Constraints (L1)	New Entrants (L2)	Active Investors (L3)	Deterred Investors (L4)
Applied for loan but denied	yes	yes	Yes	yes
No loan application	yes	yes	Yes	yes
No line of credit from financial institutions		yes		
Invested using internal funds or informal source			Yes	
No investment		yes	No	yes

Source: Author's computation

While financial liberalization index was constructed using the following indicators; bank credit to private sector as a ratio of GDP, lending-deposit spread, securities of government to GDP, total debt securities of financial and non-financial corporation to GDP, and stock market capitalization. Given the wide range of policy issues, it is believed that construction and use of this index provide an important tool for answering the research questions under consideration.

The study applies a probit model for the binary indicators of the credit constraints measures. The probit model is:

$$\Pr[C(n_i) = 1 | FL, X_i] = \Phi(FL\beta_{FL} + X_i\theta) \dots \dots \dots (1)$$

where Pr is the outcome of the dummy (1 – 0) variable for the i^{th} observation, n = 1, ..., 4 represents credit constrained categories (i.e. General constrained, New entrants, Active investors and Deterred investors) where:-

General constrained = 1 if firm applied for loan and denied or did not applied due to reasons such as: complex procedure, size and amount mismatched or high collateral required.

New Entrants = 1 if firm has no line of credit from banks and missed profitable investment project

Active Investors = 1 if firm applied for credit and denied but use some internal finance to fund investment

Deterred Investors = 1 if firm applied for loan and denied, missed profitable project but has a line of credit from banks

Φ = standard cumulative normal distribution function.

FL = financial liberalization index

X_i = control variables (firm characteristics, sales growth, employment growth, domestic credit to private sector).

Size: 0 = small (employees between 1 – 19), 1 = medium (employees between 20 - 99), 2 = large (employees above 100)

Age: 0 = established, 1 = young (the classification is based on above or below the median age)

Legal status: 0 = publicly listed firms, 1 non-listed firms

Ownership: 0 = domestic, 1 = foreign

Exporter: 0 = non-exporter, 1 = exporter

Sales growth = natural log of annual sales

Employment growth: natural log of employment

Domestic credit to private sector: refers to financial resources provided to the private sector by financial corporations

In standard probit model, the probability of a success is modelled based on the assumption that the variance of the error term is constant (homoscedastic). However, in some cases the variance can vary systematically producing heteroscedasticity. In the presence of any form of heteroscedasticity, unmeasured heterogeneity, omitted variables, nonlinearity of the functional form or error in the assumption of distribution, Green (2000) argued that probit maximum likelihood estimate is not consistent. Therefore, we conducted LR test and the result produced a statistically significant chi-square p-value (0.039) rejecting the hypothesis that the variance are constant (see appendix for the plot). Hence, we employed a heteroscedasticity robust estimator for probit to address this problem. In the model, FL stands for financial liberalization index. If $\beta_{FL} < 0$ credit constraints are reduced by FL, if $\beta_{FL} = 0$ no impact of financial liberalization on access to finance, if $\beta_{FL} > 0$ financial liberalization increases credit constraints.

There is an argument that both financial liberalization and the overall level of credit availability are jointly determined. Hence, financial liberalization is endogenous. Given the precedent in the literature (Lambsdorff & Schulze, 2016) bribery is used as an instrument for financial liberalization. To test the robustness of bribery, the IV probit model is estimated using the two-step procedure of Newey (1987).

4. Results and Discussion

Table 2 displays the regression results of the standard probit model as well as the maximum likelihood IV probit model. Before proceeding with the analyses, we considered two tests statistics; one for the presence of endogeneity and the other for the relevance of instruments used. The p-values for the Wald test for exogeneity is significant at most 10 percent level of

significance in all the regressions, supporting the use of an instrumental variables strategy. The second is the over-identifying restrictions tests for the validity of the instrument using the Anderson-Rubin (AR) method. The result is significant too, suggesting that the instrument is not weak.

Table 2: Impact of Financial Liberalization on Credit Constraints – Probit/IV Probit Models

Variables	General Constraints		New Entrants		Active Investors		Deterred Investors	
	Probit	IV MLE	Probit	IV MLE	Probit	IV MLE	Probit	IV MLE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Financial Liberalization</i>	-0.059*** (0.0154)	-0.0268** (0.0132)	-0.161*** (0.0226)	0.0138 (0.0196)	-0.0248* (0.0132)	-0.0321* (0.0178)	-0.0554*** (0.0131)	-0.043*** (0.0156)
<i>Exporter</i>	0.00803 (0.230)	0.157 (0.529)	0.424 (0.376)	1.027 (0.775)	-0.282 (0.207)	0.481 (0.657)	0.511** (0.213)	-0.577 (0.602)
<i>Established firms</i>	0.108* (0.0588)	0.231** (0.109)	-0.0563 (0.0694)	-0.0769 (0.139)	0.0381 (0.0492)	0.269* (0.138)	0.0741 (0.0482)	0.299*** (0.115)
<i>Foreign – owned</i>	-0.0616 (0.146)	-1.059** (0.435)	-0.0298 (0.155)	0.602 (0.539)	-0.276** (0.120)	-1.366*** (0.482)	-0.0597 (0.115)	-1.182*** (0.427)
<i>Medium</i>	0.0158 (0.0655)	0.108 (0.135)	-0.142* (0.0780)	0.584** (0.181)	-0.0301 (0.0546)	0.00780 (0.164)	-0.0539 (0.0533)	-0.0227 (0.143)
<i>Large</i>	-0.374** (0.164)	-0.144 (0.331)	-0.755*** (0.128)	0.208 (0.394)	-0.959*** (0.122)	-0.781** (0.379)	0.0528 (0.112)	-0.668* (0.344)
<i>Publicly – listed</i>	-0.510 (0.355)	-0.699 (0.579)	-0.383* (0.219)	-0.165 (0.379)	-0.476** (0.223)	-0.695 (0.384)	-0.299 (0.212)	-1.202** (0.611)
<i>Sales growth</i>	-0.0241 (0.0167)	0.150 (0.0939)	-0.0693*** (0.0185)	-0.267* (0.146)	0.0926** * (0.0138)	0.287** (0.125)	-0.0987*** (0.0137)	0.255** (0.114)
<i>Wald Test $\chi^2(p$ – value)</i>	-	0.0388	-	0.0639	-	0.0784	-	0.0065
<i>AR Test $\chi^2(p$ – value)</i>		0.030		0.046		0.057		0.002
<i>Number of observator</i>	2988	1281	3475	1537	3290	1541	3482	1538
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author's calculation using sample from WBES

1. * p<10, ** p<5, *** p<1.
2. All estimates are robust to heteroscedasticity
3. Instrumental variables for IV probit is bribe intensity
4. Other control variables include; employment growth, domestic credit to private sector as a percentage of GDP (not reported)
5. AR test: for instrument validity

The co-efficient of financial liberalization is negative and significant across four of the measures of credit constraints using the standard probit model and significant only in three of the measures using the IV probit model. In the case of the standard probit estimates, the effect is significant at 1 percent level of significance in the first, second and fourth regressions while in the third regression, the estimate is significant at 10 percent level of significance. This indicates that with higher levels of financial reforms, firm face lower credit constraints. However, with respect to “New Entrants”, the coefficient is positive even though not statistically significant indicating increase in credit constraints due to financial reform.

4.1. Financial Liberalization and Access to Finance – Marginal Effect

To establish the magnitude of the effect of financial liberalization on financing constraints, table 3 presents the probit marginal effects for both the standard probit and IV probit models. The marginal effects presented consider a change in the regressors on the predicted probability of a positive outcome i.e. the effect of a unit change in the regressors on the probability of being financially constrained.

Table 3: Marginal Effect – Impact of Financial Liberalization on Credit Constraints
(Probit/IV Probit Models)

Variables	General Constraints		New Entrants		Active Investors		Deterred Investors	
	Probit	IV MLE	Probit	IV MLE	Probit	MLE	Probit	MLE
<i>Financial Liberalization</i>	-0.016*** (0.0042)	-0.0237*** (0.009)	- 0.023*** (0.0032)	0.0112 (0.0139)	-0.010* (0.0051)	- 0.027*** (0.011)	-0.021*** (0.0050)	- 0.034*** (0.007)
<i>Exporter</i>	-0.0022 (0.063)	0.1386 (0.4769)	0.060 (0.054)	0.839 (0.5433)	-0.109 (0.0799)	0.4084 (0.606)	0.193** (0.0801)	-0.454 (0.428)
<i>Established firms</i>	-0.029* (0.016)	-0.2047** (0.088)	-0.008 (0.0098)	-0.063 (0.1073)	0.0147 (0.0191)	-0.229** (0.100)	0.028 (0.0181)	- 0.235*** (0.077)

<i>Foreign – owned</i>	-0.0167	-0.937***	-0.0042	0.4917	-0.107**	-1.161***	-0.0221	-	0.929***
	(0.0397)	(0.3167)	(0.0221)	(0.369)	(0.0461)	(0.275)	(0.0432)	(0.239)	
<i>Medium</i>	0.0044	0.0951	-0.020*	0.478***	-0.117	0.007	-0.020	-0.018	
	(0.018)	(0.1229)	(0.011)	(0.131)	(0.0212)	(0.140)	(0.020)	(0.111)	
<i>Large</i>	-0.086	-0.1276	-0.154***	0.1696	-0.331***	-	0.664***	0.0198	-0.525*
	(0.032)	(0.2859)	(0.0343)	(0.3017)	(0.032)	(0.271)	(0.0415)	(0.233)	
<i>Publicly – listed</i>	-0.109**	-0.6184	-0.0683	-0.1347	-0.178**	-0.590*	-0.115	-0.945**	
	(0.0557)	(0.5116)	(0.0474)	(0.3167)	(0.077)	(0.321)	(0.0823)	(0.488)	
<i>Sales growth</i>	-0.0065*	0.1331*	-	-0.218*	0.358***	0.244***	-	0.0373***	0.200**
	(0.0044)	(0.0694)	(0.0026)	(0.0805)	(0.005)	(0.069)	(0.0051)	(0.060)	
<i>Wald Test $\chi^2(p - value)$</i>		0.0351		0.0476		0.0631		0.0048	
<i>Number of observations</i>	2988	1281	3475	1537	3290	1541	3482	1538	
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Source: Author's calculation using sample from WBES

1. * $p < 10$, ** $p < 5$, *** $p < 1$.
2. All estimates are robust to heteroscedasticity
3. Instrumental variables for IV probit is bribe intensity
4. Other control variables include; employment growth, domestic credit to private sector as a percentage of GDP (not reported)
5. AR test: for instrument validity

Looking at the magnitude of the effects in the IV probit model, starting with the general classification, that is referring to firms that are classified as “General Constrained”, a one-unit increase in the index of financial liberalization reduces the probability of facing a binding credit constraint by 2.4 percent. The result is similar in other two constrained categories expect the “New Entrants”. With respect to “New Entrants”, the effect is positive and not statistically significant. This category of firms supposed to show a high degree of sensitivity to developments in financial markets in particular, because they do not have access to formal financial services before. However, the result remains not significant. This point is important in information asymmetry. Given that they are “New Entrants”, information on their transaction and relation with the banks is not well known. Hence, financial market is unable to channel investment funds to them.

In view of “Deterred Investors,” one-unit increase in the degree of liberalization decreases the probability of being credit constrained by 3.4 percent. These are firms, that missed investment opportunities in the past due to a lack of availability of credit and the results here indicate that they are significant beneficiaries of financial reform. For “Active Investors”, that is those despite being constrained managed to invest using internal funds or informal sources of finance, the effect of financial liberalization is less pronounced. However, increase in liberalization index accounts for a 2.1 percent reduction in their probability of being credit constrained. Given the nature of the financial liberalization index, it is difficult from a policy perspective to understand the real world impact of a one-unit change in the index on the marginal effect. As the index is a composite measure covering various dimensions of financial markets, changes across a broad spectrum of policies could initiate a one-unit change to the index as captured by the marginal effect.

However, the aim of this research is not to consider the specific policy changes but to capture the overall degree of financial market openness and its effect on the credit environment. A simple stylized example can help to clarify. For firms classified as “Deterred Investors”, the marginal effects indicate a one-unit increase in the index reduces constraints by 3.4 percent. Assuming that a given year indicates 2007 with an index score of 1.5, Nigeria wishes to strengthen the financial reform measures (across any of the dimensions of financial policies considered) to boost the index to a certain higher level say 7.5 units in the next year. This would reduce the probability of being credit constrained of the “Deterred Investors” by approximately 17 percent.

To sum up, there is evidence that financial liberalization reduces the probability of being credit constrained, identifying as key channel through which finance can affect economic growth. The effect is stronger for firms classified as “Deterred Investors” that do not undertake any investment due to capital market imperfection, but currently have access to formal finance. These results indicate that financial market liberalization leads to financial deepening but also financial widening. Financial liberalization can facilitate additional investment as the probability of being constrained decreases with increased liberalization for firms classified as “Deterred Investors”. On the other hand, the result pointed out the inability of financial liberalization to foster inclusive finance, because some categories of constrained firms do not benefit from the reform.

5. Conclusion

The analysis yields number of conclusions. Firstly, looking at the four different constrained classification, financial liberalization reduces the probability of being credit constrained from 2 percent to 3 percent depending on the firm’s classification. For firms that forgone profitable

investment or specifically those classified as “Deterred Investors”, an increase in financial liberalization decreases their probability of being constrained by 3.4 percent. Given that, these firms did not undertake profitable investment due to capital market imperfection prior to the reform; thus, there is evidence of a widening of the financial sector. Furthermore, firms with existing finance or those classified as “Active Investors” also benefit from the reform pointing to the evidence of financial deepening. So based on these two evidences, financial liberalization improves financial constraints of firms in Nigeria.

However, examining the constrained categories “New Entrants”, or firms that do not have formal finance and attempted to apply for lending facilities but denied by the current market structure, their financing constraints increase due to the financial reform. This shows that financial liberalization has not eliminated the problem of information asymmetry in the financial market. This finding supports the argument that financial liberalization is an incomplete policy prescription. The policy reform neglects the possibility of endogenous constraints in the financial market, such as imperfect information, could be significant barriers to efficient allocation of credit even when banks are liberalized, interest rate ceilings are removed. Nor has the literature dealt with market structure, e.g., the oligopolistic and cartelized banking systems found in most developing countries like Nigeria. This confirmed the argument that under asymmetric information, decentralization through the price mechanism (i.e. allowing banks to set their interest rates freely) will not necessarily lead to a Pareto-efficient equilibrium (Stiglitz, 2000). Policy makers in Nigeria should focus on improving credit allocation mechanisms and targeting financial assistance especially to new entrants. Such mechanisms should include; providing an enabling environment and tackling market failure like information asymmetry problem, as well as creating incentives like strong legal institutions that can enforce contracts. These should remain as a key policy focus for the financial development agenda of the country.

References

- Ajide, F. M. (2017). Firm-specific and institutional determinants of corporate investments in Nigeria. *Future Business Journal*, 3(2), 107-118.
- Ang, J. B. (2010). Finance and inequality: the case of India. *Southern economic journal*, 76(3), 738-761.
- Ayyagari, M., Juarros, P. F., Martinez Peria, M., & Singh, S. (2016). *Access to finance and job growth: firm-level evidence across developing countries* (No. 7604). The World Bank.

- Beck, T., Demirgüç-Kunt, A., Laeven, L., & Maksimovic, V. (2006). The determinants of financing obstacles. *Journal of International Money and Finance*, 25(6), 932-952.
- Byiers, B., Rand, J., Tarp, F., & Bentzen, J. (2010). Credit demand in Mozambican manufacturing. *Journal of International Development: The Journal of the Development Studies Association*, 22(1), 37-55.
- Central Bank of Nigeria (2011). *Banking Sector Reforms in Nigeria*. CBN publications Understanding Monetary Policy Series No 7
- Chan, K. S., Dang, V. Q., & Yan, I. K. (2012). Chinese firms' political connection, ownership, and financing constraints. *Economics Letters*, 115(2), 164-167.
- Ferrando, A., & Mulier, K. (2015). Firms' financing constraints: Do perceptions match the actual situation? *The Economic and Social Review*, 46(1, Spring), 87-117.
- Gelos, R. G., & Werner, A. M. (2002). Financial liberalization, credit constraints, and collateral: investment in the Mexican manufacturing sector. *Journal of Development Economics*, 67(1), 1-27.
- Gezici, A. (2007). *Investment under financial liberalization: Channels of liquidity and uncertainty* (Doctoral dissertation, University of Massachusetts Amherst).
- Greene, W. H. (2003). *Econometric analysis*. Pearson Education India.
- Guermazi, A. (2014). Financial Liberalization, Credit Constraints and Collateral: The Case of Manufacturing Industry in Tunisia. *Procedia Economics and Finance*, (13), 82-100.
- Hansen, H., & Rand, J. (2011). *Another perspective on gender specific access to credit in Africa* (No. 2011/14). FOI Working Paper.
- Hermann, J. (2014). Financial constraints on economic development: theory and policy for developing countries. *CEPAL Review*, 2014(114), 67-82.
- Jerzmanowski, M. (2017). Finance and sources of growth: evidence from the US states. *Journal of Economic Growth*, 22(1), 97-122.
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3), 717-737.

- Koo, J., & Maeng, K. (2005). The effect of financial liberalization on firms' investments in Korea. *Journal of Asian Economics*, 16(2), 281-297.
- Lambsdorff, J., & Schulze, G. G. (Eds.). (2016). *Corruption at the Grassroots-level—Between Temptation, Norms, and Culture: Themenheft Jahrbücher für Nationalökonomie und Statistik 2/2015*. Walter de Gruyter GmbH & Co KG.
- Lee, J. (2006). *Financial reform: Benefits and inherent risks* (No. 44). ADB Institute Discussion Papers.
- Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money, Credit & Banking*, 30(3), 596-614.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1), 31-77.
- Newey, W. K. (1987). Efficient estimation of limited dependent variable models with endogenous explanatory variables. *Journal of Econometrics*, 36(3), 231-250.
- Obamuyi, T. M. (2009). Government financial liberalization policy and development of private sector in Nigeria: Issues and challenges. *www.growinginclusivemarkets.org*.
- Obokoh, L. O., & Asaolu, T. O. (2012). Examination of the relationship between financial market liberalization and the failures of small and medium sized enterprises in Nigeria. *International Business Research*, 5(1), 182-193.
- O'Toole, C. M. (2014). Does Financial Liberalisation Improve Access to Investment Finance in Developing Countries? *Journal of Globalization and Development*, 5(1), 41-74.
- Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. *World Development*, 28(6), 1075-1086.

