Access to Debt Finance: Which Policies Work? Empirical Evidence from Sub-Saharan Africa

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Abstract: Are the structural policy reforms effective in reducing debt financing constraints on formal sector enterprises in sub-Saharan Africa? We do not know. And the reason is the relatively limited research on the effectiveness of policies in the credit market. Using policy variables from the World Bank and the Enterprise Surveys data, the analysis involves three-way error component models. The results are indicative that taken together; structural policy reforms reduce debt financing constraints, at least, as it pertains to working capital needs. There is heterogeneity in the results. Changes in the business regulatory environment benefit large firms more than small ones. Financial sector reforms affect enterprises of all sizes relatively equally. For all the twelve countries, together, trade sector reforms initially increase the likelihood of access to debt finance by 20 percent until a policy threshold, beyond which progressive reforms in the trade sector reduce the probability by as much as 13 percent. Also, not all countries experience the same effects from trade sector reforms. The result is robust to different indicators of credit constraint and measures of structural reforms. The results have implications on the World Bank's push towards reforms on trade policy across countries.

Keywords: Debt-financing, trade reforms, structural reforms.

1. INTRODUCTION

Are the structural policy reforms effective in reducing debt financing constraints on formal sector enterprises in sub-Saharan Africa? One would think that the answer to the question above is an obvious yes. But, in fact, the answer remains unknown. And the reason is the relatively limited research on the effectiveness of policies in the credit market, especially in sub-Saharan Africa. The theoretical literature on dual and common agency problems in the credit market suggest a role for policy in easing financing constraints on enterprises. However, the effectiveness of specific policies remains unknown. This paper examines the issue of whether or not structural reforms, as defined by the World Bank within the context of the Country Policy and Institutional Assessment reports, can influence the credit climate for particular firms in sub-Sahara Africa.

The World Bank (2013), observes that the perceptions of the regulatory environment in various economies affect start-up rates of enterprises, thereby affecting job creation. Consequently, in recent years, the World Bank has highlighted the importance of creating an enabling environment for businesses to thrive. Earlier research on enterprise financing constraints, including Kuntchev *et al*. (2014), Ayyagari, Demirgüç-Kunt, & Maksimovic (2008), Beck and Demirguc-Kunt (2006) and Kaplan and Zingales

(1997), have tended to focus on the effects of financing constraints on enterprise growth, with limited research on the effectiveness of policies in the credit market.

Small and Medium Scale Enterprises, (SMEs) which constitute over 95% of the enterprises in the sample, contribute to job creation and economic growth. Ayyagari, Demirguc-Kunt, & Maksimovic (2011) write that 95% of enterprises in the world are SMEs and account for about 60% of jobs created in the private sector. In South Africa, Abor & Quartey (2010), reports that 91% of the formal sector enterprises are SMEs and account for 61% of total employment. In the case of Ghana, Abor and Quartey (2010) report that SMEs contribute 92% of local businesses and 70% on average, to Ghana's GDP, while accounting for 80% of total jobs in the Ghanaian economy. Therefore, addressing financing constraints facing enterprises is of the first order.

The data is from three sources, namely, the Country Policy and Institutional Assessment (CPIA) reports, Economic Freedom Index from the Fraser Institute, as reported by Gwartney, Lawson, & Hall (2013), and the World Bank Enterprise Surveys (WBES). The CPIA attempts to measure the conduciveness of a country's institutional and policy environment for economic growth. There are twelve (12) countries from sub-Saharan Africa in the sample. The sample size is up to 9,366 enterprises with 8,002 longitudinally observed enterprises. For each enterprise in each country, there are two non-consecutive data points. The analyses involve three-way error component random effects

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panel data models. The choice of the model driven by nature of the left-hand side variables.

There are two left-hand side variables (indicators of the credit status of an enterprise). The indicators of the financial situation of the enterprise are *status,* a derived ordered outcome variable following Kuntchev *et al*. (2014), and *credit*; a binary outcome variable based on whether or not enterprises had access to a line of credit or loan or not. *Credit* comes from responses to the question "at this time, does this establishment have a line of credit or a loan from a financial institution?" Facilities with loans or lines of credit get a value of one and zero otherwise. S*tatus* would be measuring the effect of access to finance on investment, while *credit* would be measuring the effects of access to finance on working capital. Structural policy index (*reform)* constitute the primary explanatory variable. The structural policy variable is an index consisting of trade, financial sector reforms, and the business regulatory environment.

After controlling for enterprise, country, and time effects, the results are indicative that taken together; structural policy reforms reduce debt financing constraints facing enterprises, at least, as it pertains to their working capital needs. There is heterogeneity in the results. Changes in the business regulatory environment benefit large firms more than small ones. Financial sector reforms affect enterprises of all sizes relatively equally. There is additional heterogeneity in the consequences of trade sector reforms. For all the twelve countries, together, trade sector reforms initially increase the likelihood of access to debt financing by 20 percent until a policy score of 3.5. Beyond a score of 3.5, progressive reforms in the trade sector reduce the probability by as much as 13 percent. Also, not all countries experience the same effects from trade sector reforms. Improvements in the score on trade sector reforms have adverse effects on the probability of access to debt finance by enterprises in Angola and Democratic Republic of Congo, for instance. However, the effect is positive for Rwanda. These results present a challenge to the uniform reforms promoted by the World Bank. The results are robust to different specifications and policy variables.

The present study contributes to various strands of the literature. It relates to the research on financing entrepreneurship and SMEs. It represents an empirical adaptation of the theoretical model on the dual and common agency problems in the credit market by Tirole (2006). The present study is one of the few studies to examine empirically, the impact of financial sector reforms in the credit market. It also builds on and extends an earlier study by Kuntchev *et al*. (2014). It builds on that study in the sense that it uses their approach in identifying credit-constrained enterprises but differs in method and policy variables analyzed. Kuntchev *et al*. (2014) use cross-sectional data while the current study uses panel data.

2. LITERATURE REVIEW

Before the seminal work by Schumpeter (1934), economic theory treated the financial sector as playing a minor role in the process of economic growth. The insight of Schumpeter led to changes. In their seminal paper, Gurley & Shaw (1955) argue that at low levels of economic growth, firms self-finance their investments and switch to debt finance as the economy grows. Financial markets and institutions, acting as intermediaries, become principal actors in investment financing, which in turn, influences long-term economic growth. Goldsmith (1969) also find that as economies grow, banks and nonbank financial institutions grow in importance in the economy, highlighting the role of financial markets and institutions for economic growth. How do SMEs finance their investments? Beck *et al*. (2009), in a literature review, observe that enterprises in developing countries have difficulty accessing resources for investment. They note that the inability of enterprises to access external finance for investment is a binding constraint on economic growth in developing countries. Beck *et al*. (2009), argue for government policies that provide greater access to finance. Fazzari, Hubbard, Petersen, Blinder, & James (1988) observe that due to asymmetric information, internal and external sources of financing are not perfect substitutes; external finance is more costly than internal finance. Du & Girma (2012) support this view, arguing that because the fixed cost of raising external funds is non-trivial for small enterprises, size is important in determining access to finance.

Beck & Demirguc-Kunt (2006) also find that size, age, and ownership structure of an enterprise are determinants of access to finance—older, larger, and foreign-owned enterprises are less likely to be credit constrained. Cassar (2004) on the other hand, observe that creditors might perceive incorporation as a sign of credibility and formality of operations, as such; incorporated enterprises are likely to have more access to debt finance. On the role of policy in easing credit constraints, Ayyagari, Demirgüç-Kunt, & Maksimovic (2008) find that instability in the policy environment

negatively affects enterprise growth. However, the effectiveness of specific policies in the credit market remains inconclusive.

Another issue relevant to the financing constraint literature is the use of trade credit by enterprises. On the supply of trade credit, Burkart & Ellingsen (2004) explain that the relative illiquidity of inputs makes it difficult for firms to divert for personal gain, unlike loans, providing an opportunity for suppliers of trade credit to reduce the moral hazard and adverse selection problems associated with loans. On the demand side, it is not too obvious why enterprises require or use trade credit, despite it being a very expensive source of credit. Tirole (2006) reports that the terms of a trade credit contract are typically not favorable to enterprises. In the U.S., Tirole states that in some cases, the overall cost of the trade credit is as much as 37.24% per annum. According to Smith (1987), to creditors in the capital market, possession of a trade credit contract is a signal of borrower type. The implication is that in certain situations, trade credit functions as a screening device.

Tirole (2006, p. 546-549) provides a framework for thinking about how policy can influence credit contracts, and hence, credit constraints in the credit market. Tirole observes that for a private financing agreement between a lender and a borrower, lender returns depends on the behavior of the borrower, and the policy choices of the borrower's government. Financial arrangements between creditors and borrowers influence each other through their impact on the incentives of the government of the borrower. The government is the common agent of all participants in the financing contract. A profit-enhancing policy action by the government that signals the protection for the rights of lenders and borrowers alike induces more financing deals and reduces the likelihood that an enterprise is a credit-constrained one. The empirical analysis in this paper proceeds with the assumption that the government chooses and commits to its policy actions, placing equal weights on the borrowers and creditors. Enterprises that can raise funds can finance their investments, hence are not financially constrained. Those unable to sign financing contracts will not be able to fund their investments, hence, will be credit constrained.

Any empirical study on 'credit constrained enterprises' has to contend with the characterisation of a credit-constrained enterprise—how does one objectively identify one, and from whose perspective?

There are two approaches in the literature. The first method involves analyzing the financial reports of firms, if available. The second method includes the use of responses to survey questions. Kaplan & Zingales (2000) classified enterprises based on qualitative and quantitative information contained in their annual financial reports. They identify enterprises without access to more resources than needed to fund their investment as credit constrained, and those with access as unconstrained. However, Fazzari, Hubbard, & Petersen, (2000) observe that the data used by Kaplan & Zingales (2000) coincided with years in which the enterprises were financially distressed and, therefore, presents a distorted view of their financial positions.

Bigsten, Collier, & Dercon (2003) provide another classification scheme using survey data. Based on why enterprises did not apply for loans, they grouped them into three. The first group consists of "financially unconstrained enterprises without credit demand"; this group consists of enterprises that did not apply for loans because they did not need one. The second group consists of "financially constrained enterprises;" this group consists of those that applied for loans, but the application rejected, enterprises that did not have enough collateral, enterprises that considered the application process too complicated, and enterprises who anticipated rejection even if they were willing to pay the current interest rates. The third group consists of "financially unconstrained enterprises with credit demand"; this group consists of those that obtained loans.

Kuntchev *et al*. (2014) present a variant of the scheme by Bigsten, Collier, & Dercon (2003) using enterprise level data from the World Bank Enterprise Surveys (WBES). They classify enterprises into "not credit constrained," "may be credit constrained," "partially credit constrained," and "fully credit constrained." Figure **1** presents a schematic representation of their classification scheme. This study adopts the classification system by Kuntchev *et al*. (2014) in measuring one of the three indicators of the credit constraint status of enterprises.

Thus, far, the previous studies focused on the enterprise specific characteristics without much attention to whether or not; structural policy reforms can be effective in reducing debt-financing constraints on enterprises. This gap in the literature is a significant omission since businesses, and financial institutions do

not exist and operate in isolation; they function in a particular institutional and regulatory framework.

3. IDENTIFICATION STRATEGY AND DATA

3.1. Identification Strategy

The analyses involve a three-way error component model of the form

$$y_{ict} = \ln(reform_{ct})\beta_1 + x'_{ict}\beta_2 + z'_{ic}\beta_3 + $$
$$credit\ to\ private\ \sec tor\ /\ GDP_{ct}\beta_4 + u_{ict} \tag{1}$$

$$\text{Where } u_{ict} = \mu_i + \eta_c + \lambda_t + v_{ict}$$
$$(i = 1,\ldots,N, t = 1,\ldots,T; c,\ldots,M) \tag{2}$$

Where y_{ict} is one of the two indicators of access to debt financing: *credit*—whether an enterprise *i* in country *c* at time *t* has a line of credit or loan or not, and the derived ordinal outcome variable, *status*, following Kuntchev *et al*. (2014).

Kuntchev *et al*. (2014) classify enterprises into "not credit constrained (NCC)," "may be credit constrained (MCC)," "partially credit constrained (PCC)" and "fully credit constrained (FCC)" using data from the World

Bank Enterprise Surveys (WBES). Figure **1** shows a schematic representation of the classification scheme. According to Kuntchev *et al*. (2014), a *fully credit constrained* enterprise must have applied for credit in the past fiscal year, and the application rejected. Also, the enterprise should not have outstanding loans from the formal credit market at the time of data collection. A *fully credit constrained* enterprise also includes enterprises that did not apply for credit in the past fiscal year, because of reasons other than having enough capital. A *partially credit constrained* is one that applied for loans or lines of credit but does not have bank financing. Those in this category may have informal financing. A business *may be constrained* if it applied for loans and has bank financing. Those that do not have debt finance and did not request a loan in the earlier fiscal year and the reason they did not apply is that they had enough capital are *not credit constrained*. The ordinal variable *Status* comes from the four categories, where NCC takes a value of one, MCC as two, PCC as three, and FCC as four. *Credit* is a binary variable based on whether enterprises had access to a line of credit or loan or not. This variable comes from responses to the question "at this time, does this establishment have a line of credit or a loan from a
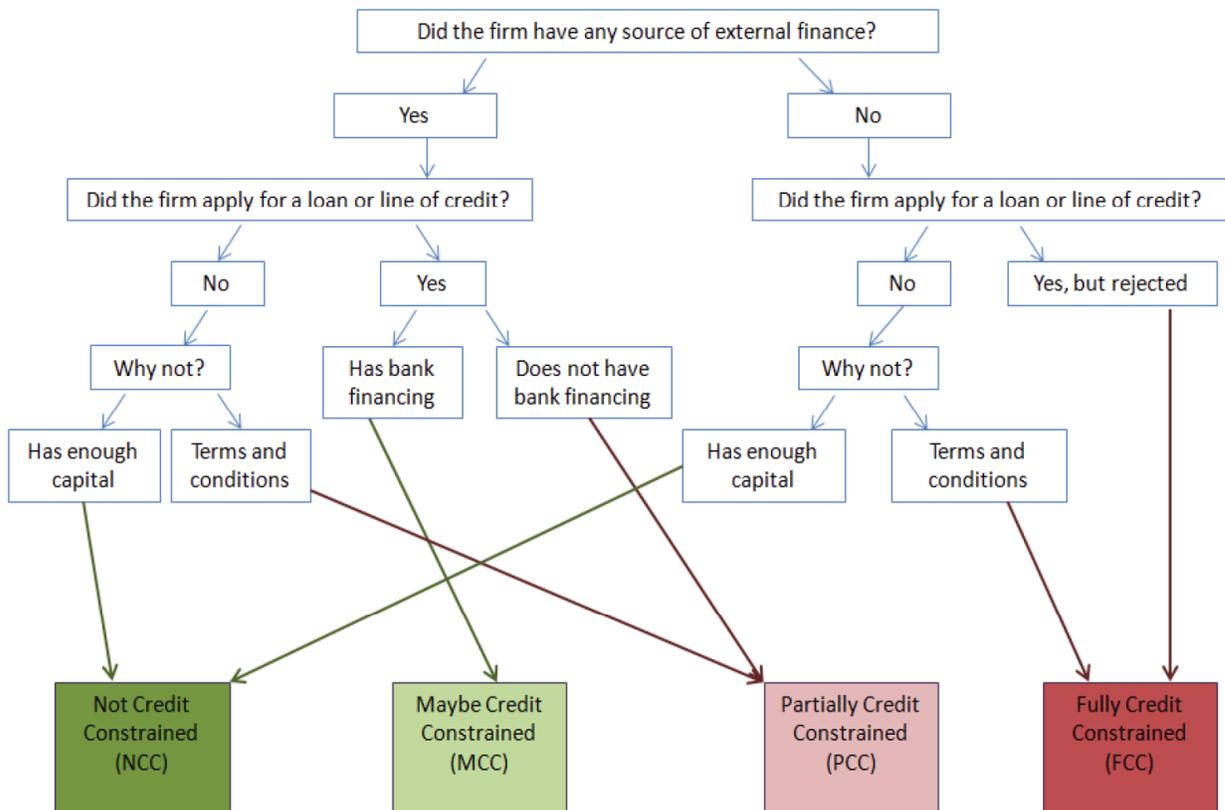

Figure 1: Categories in the outcome variable *status*.

Source: Kuntchev *et al*. (2014).

financial institution?" Facilities with loans or lines of credit get a value of one and zero otherwise.

The primary explanatory variable is *reform*$_{ct}$ which captures time varying structural policy reforms in the various countries. It represents the World Bank's Country Policy and Institutional Assessment (CPIA, 2013) index on structural policy reforms. The structural policy reforms cover trade, financial sector reforms, and the business regulatory environment. The trade component attempts to assess how the policy framework fosters regional and global integration in goods and services, focusing on the trade policy regime and trade facilitation. Assessment of the trade regime covers tariffs, non-tariff barriers, and obstacles to trade in services. On the financial sector, the CPIA measures policies and regulations that affect financial stability, efficiency, and access. The business regulatory environment component attempts to assess the degree to which the quality of the policy, legal, and regulatory framework for enterprises is profit-friendly to attract private investment. The regulatory framework includes enforcement of contracts, collateral registry, regulations on entry, exit, and competition, regulations on businesses in operations and regulations concerning land and labour. The index on structural reforms is on a six-point scale—with a 1-point rating corresponding to the lowest recorded performance while a 6-point rating corresponds to highest recorded performance.

The control variables include x_{ict} which is a vector of time varying enterprise characteristics comprising age, and size of the entreprise, following Beck & Demirguc-Kunt (2006). Concerning size, enterprises with at least five but less than twenty full-time workers are small; those with a full-time staff of between twenty and ninety-nine are medium; and those with more than hundred employees, large. z_{ic} a vector of time independent variables, include registration status at start up following Cassar (2004), gender of the manager following Kuntchev *et al.* (2014), the ownership structure of the enterprise — foreign-owned, sole proprietorship, product market, the legal status of the enterprise, use of trade credit, following Petersen & Rajan (1997) and Tirole (2006), and type of industry (manufacturing or services). *Credit to private sector/GDP*$_{ct}$ denote the share of credit to the private sector as a percentage of GDP, following Kuntchev *et al.* (2014). There is control for year of sampling. μ_i denotes the unobserved enterprise specific heterogeneity; η_c denotes country specific effect. λ_t denotes time specific effect and v_{ict} denotes the

remainder disturbance, assumed independently and identically distributed.

Greene (2012, p. 717) reports that in the case of binary choice models with panel data, in estimating a fixed effects model of equation (1), one has to contend with incidental parameters problem. This issue, Greene argues, makes the maximum likelihood estimator inconsistent. The random effects model too, Greene (2012) argues, requires the assumption that μ_i and x_{it} are uncorrelated, but offers consistent estimates, hence it is the approach adopted in the estimation of equation (1). Concerning the outcome variable *status,* Pfarr (2011) observes that the random effects generalised ordered probit specification preserve the unobserved enterprise heterogeneity. The estimation proceeds in two stages. First, in the basic model, there is an estimation of each model using the composite form of the primary explanatory variable, *reform* (for structural policy reforms index) and the control variables. If the primary explanatory variable is statistically significant, the second stage involves re-estimating the model, but this time, using the disaggregated policy variables.

3.2. Data

The analysis uses three data sources. The primary explanatory variables come from the Country Policy and Institutional Assessment (CPIA, 2013) reports, and the Economic Freedom Index (EFI) from the Fraser Institute, as reported by Gwartney, Lawson, & Hall (2013) (for robustness checks), and the World Bank Enterprise Survey (WBES). The left-hand side variables and the enterprise level variables come from the WBES. Data on the share of credit to the private sector comes from the World Development Indicators Database. There are twelve (12) countries from sub-Saharan Africa in the sample. The sample size is up to 9,366 enterprises with 8,002 longitudinally observed enterprises. Table **1** presents a breakdown of the enterprises across countries in the sample. Table **2** show the outcome variables in the sample. Table **3** present summary statistics of the variables. Figure **2** shows what enterprises in sub-Saharan Africa consider constraints on their operations, constructed from data from the WBES over the period 2009 to 2013. From the Figure, over 22% of the enterprises interviewed selected access to finance as a constraint. The average for all countries is 16%. When the survey question asks whether access to finance is a major obstacle, twenty-eight percent (28%) of all enterprises in the sample responded yes. Across the countries in

Table 1:   Distribution of Enterprises Across Countries in the Sample

Country	Sample Size	Number of Panels	Sample Period	
			First Data Point	**Second Data Point**
Angola	449	363	2006	2010
Burkina Faso	533	445	2005	2009
Cameroon	535	460	2005	2009
Cape Verde	254	201	2005	2009
Democratic Republic of Congo	699	594	2006	2010
Ghana	1214	751	2007	2013
Kenya	1370	1287	2007	2013
Malawi	310	233	2005	2009
Rwanda	453	383	2006	2010
Tanzania	1142	1117	2006	2013
Uganda	1203	1116	2006	2013
Zambia	1204	1052	2006	2013
Total	9,366	8,002		

Source: The author's compilation based on data from the WBES database.

Table 2:   Distribution of *Credit* and *Status* in the Sample

Country	Variable	Credit	NCC	MCC	PCC	FCC
Angola	Total	449	449	449	449	449
	Percentage	9.13%	36.75%	5.35%	12.69%	31.85%
Burkina Faso	Total	533	533	533	533	533
	Percentage	28.71%	14.26%	21.58%	20.26%	27.20%
Cameroon	Total	535	535	535	535	535
	Percentage	36.82%	18.13%	33.83%	27.29%	16.07%
Cape Verde	Total	254	254	254	254	254
	Percentage	41.73%	33.86%	19.29%	17.32%	23.23%
Congo, D. R.	Total	699	699	699	699	699
	Percentage	9.59%	14.02%	7.01%	24.18%	38.63%
Kenya	Total	1370	1370	1370	1370	1370
	Percentage	39.12%	23.36%	11.39%	8.76%	5.18%
Malawi	Total	310	310	310	310	310
	Percentage	34.52%	17.10%	17.74%	14.84%	30.00%
Rwanda	Total	453	453	453	453	453
	Percentage	41.28%	0.00%	28.26%	12.58%	5.74%
Tanzania	Total	1142	1142	1142	1142	1142
	Percentage	15.76%	24.08%	9.02%	36.43%	22.15%
Uganda	Total	1203	1203	1203	1203	1203
	Percentage	18.12%	31.26%	8.81%	32.34%	20.45%
Zambia	Total	1204	1204	1204	1204	1204
	Percentage	8.47%	41.03%	7.81%	24.75%	22.84%
Ghana	Total	1214	1214	1214	1214	1214
Total	Percentage	20.18%	20.26%	15.40%	34.68%	23.48%
	Percentage	22.84%	24.41%	13.31%	24.25%	20.84%

Source: The author's computation based on data from the WBES database.

Table 3:   Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Status	9,366	2.071	1.415	1.000	4.000
Reforms	9,366	3.599	0.430	2.333	4.000
Business regulations	9,366	3.513	0.618	2.000	4.500
Trade Sector reforms	9,366	3.904	0.317	3.000	4.500
Financial Sector Reforms	9,366	3.323	0.540	2.000	4.000
Share of credit to private sector	9,366	0.160	0.092	0.021	0.646
Size	7,909	1.512	0.701	0.000	3.000
Age	9,202	7.704	8.959	0.000	58.474
Foreign Ownership	9,366	0.165	0.372	0.000	1.000
Trade credit	9,366	0.440	0.496	0.000	1.000
Share traded	9,366	0.217	0.412	0.000	1.000
Female Managed	9,366	0.120	0.325	0.000	1.000
Retail	9,366	0.186	0.389	0.000	1.000
Services	9,366	0.282	0.450	0.000	1.000
Manufacturing	9,366	0.507	0.500	0.000	1.000
Sole Proprietorship	9,366	0.469	0.499	0.000	1.000

Source: The author's compilation based on data from the WBES database.
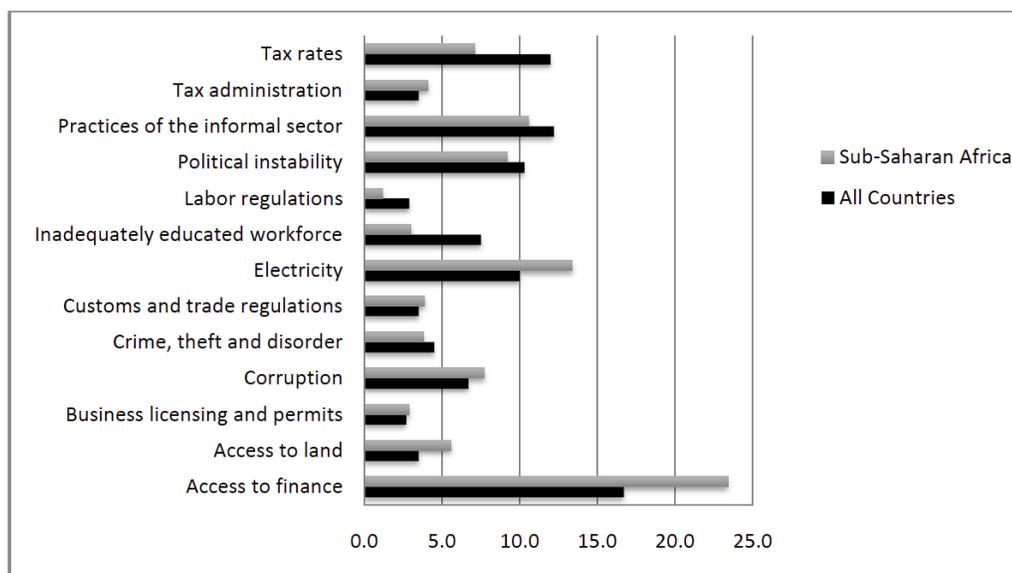

Figure 2: Business Environment Constraints.

Source: Author's calculation based on data from the WBES.

sub-Saharan Africa, the average is 42%, ranging from a low of 15% in Kenya to a high of 75% in Burkina Faso.

4. RESULTS

Table **4** presents the marginal effects of the three-way error component model for the binary outcome variable, c*redit* with the composite form of the primary explanatory variable, *reform*. The discussion of the results proceeds with the simplifying assumption that the control variables in the model do not have causal effects. From Table **4**, the coefficient on *reform* is statistically significant at 1 percent. A 10 percent increase in the score on the structural policy index in a

Table 4: Random Effects Probit Estimates for *Credit* Model

	Dependent variable: *credit*				
	(1)	(2)	(3)	(4)	(5)
ln(*reform*)	1.268***	0.479**	0.499*	1.521***	1.453***
	(0.172)	(0.168)	(0.199)	(0.329)	(0.328)
Private sector Cr/GDP		3.076***	2.019***	1.303***	1.134***
		(0.265)	(0.287)	(0.305)	(0.313)
ln(size)			0.591***	0.562***	0.547***
			(0.0679)	(0.0668)	(0.0669)
ln(age)			0.158***	0.162***	0.169***
			(0.0201)	(0.0201)	(0.0207)
Foreign-owned			-0.195**	-0.182**	-0.188**
			(0.0645)	(0.0635)	(0.0641)
Trade credit			0.604***	0.605***	0.605***
			(0.0596)	(0.0596)	(0.0598)
Share traded			0.0516	0.0997	0.149*
			(0.0632)	(0.0637)	(0.0678)
Female Manager			0.0881	0.112	0.103
			(0.0684)	(0.0680)	(0.0681)
Retail			-0.513**	-0.424**	-0.445**
			(0.159)	(0.157)	(0.159)
Services			-0.421**	-0.303*	-0.319*
			(0.154)	(0.152)	(0.154)
Manufacturing			-0.417**	-0.295*	-0.311*
			(0.151)	(0.150)	(0.151)
Sole Proprietorship			-0.206***	-0.177**	-0.173**
			(0.0572)	(0.0564)	(0.0566)
Country controls			No	Yes	Yes
Year controls			No	No	Yes
R^2					
AIC	9920.9	9726.3	7142.6	7117.5	7114.4
BIC	9942.3	9754.9	7240.0	7221.8	7225.7
F					
Observations	9366	9366	7754	7754	7754

Marginal effects; Standard errors in parentheses (d) for discrete change of dummy variable from 0 to 1; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

country, increases the probability that enterprises in the country have access to loans or lines of credit by 0.15. By implication, as the policy environment improves, there is a higher chance of an enterprise having access to debt financing to finance working capital needs. Figure **3** is an illustration of the effects of progressive increases in *reform* on the probability of having debt finance. From Figure **4**, incremental improvements in the policy environment make it easier for enterprises to access debt finance.

The next step is the augmenting the model with the disaggregated policy variables. Again, *reform* is an index consisting of three (3) components: business regulatory environment, financial sector reforms, and trade policy. Which of these three policymakers ought to prioritize? For policy relevance, there is a repeat of the analysis, but this time, using the disaggregated policy variables. Table **5** reports the marginal effects, again from the three-way error component model with statistically significant policy variables. From Table **5**, a
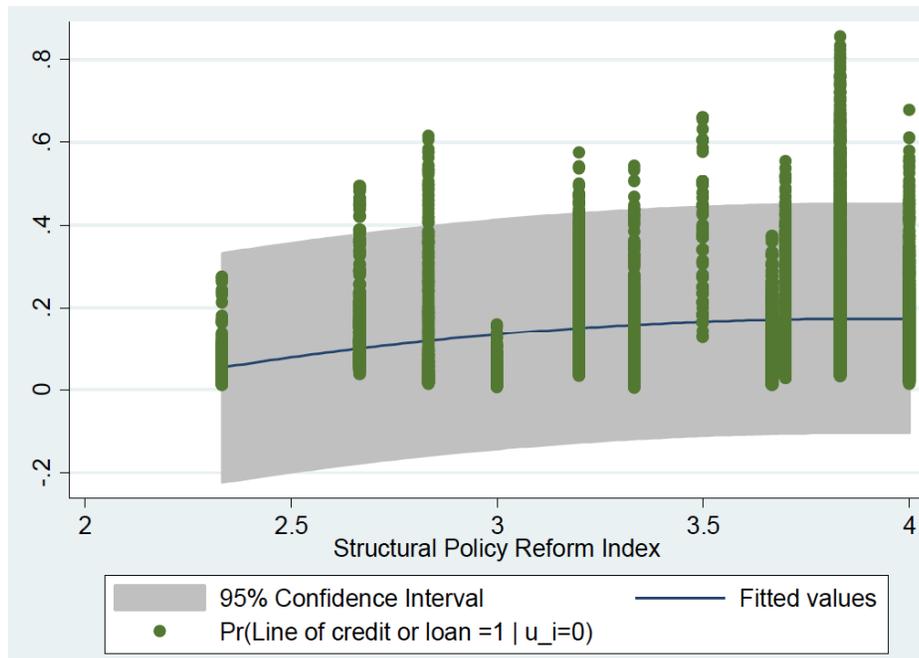
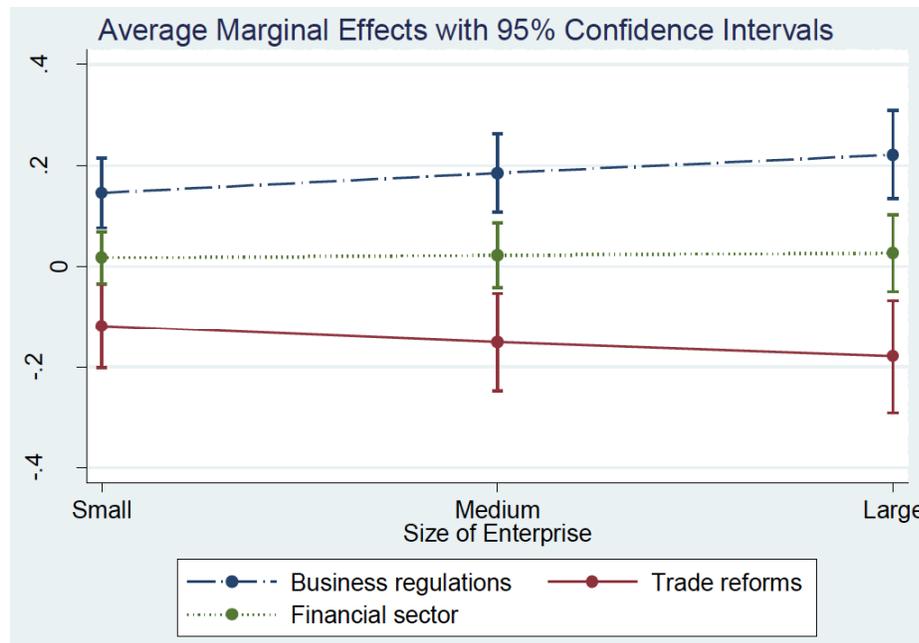**Figure 3:** Structural Reforms and Debt Financing.

Figure 4: Business Environment Regulations, Trade, and Financial Sector Reforms—By Size.

10 percent increase in the index on the business regulatory environment, and financial sector reforms increases the probability of access to debt financing for working capital purposes by 0.26 and 0.05. However, the effect on access to debt finance by increases in the index on trade sector reforms is negative. Specifically, a 10 percent increase in the index on trade sector reforms reduces the probability of access to debt finance by 0.33.

There is heterogeneity in the results. Figure **4** illustrates the average marginal effects of all three policy variables by the size of the enterprises. From the figure, reforms in the business regulatory environment benefit large enterprises more than small ones. Financial sector reforms affect businesses of all sizes relatively equally. However, the adverse effects of trade sector reforms affect big business more than the small ones. These results hold for all countries in the sample.

Table 5: Random Effects Estimates for Credit Model using CPIA—Full Model

	Dependent variable: *credit*		
	(1)	**(2)**	**(3)**
ln(business regulations)	1.378***	2.381***	2.628***
	(0.175)	(0.259)	(0.264)
ln(trade)	-3.393***	-2.838***	-3.265***
	(0.327)	(0.371)	(0.393)
ln(financial sector)	1.029***	0.549*	0.324
	(0.171)	(0.218)	(0.224)
Private sector Cr/GDP		0.822**	0.538
		(0.303)	(0.310)
ln(size)		0.526***	0.491***
		(0.0636)	(0.0629)
ln(age)		0.109***	0.122***
		(0.0185)	(0.0193)
Foreign-owned		-0.158**	-0.175**
		(0.0606)	(0.0612)
Trade credit		0.512***	0.496***
		(0.0545)	(0.0540)
Share traded		0.0725	0.178**
		(0.0600)	(0.0643)
Female Manager		0.0921	0.0632
		(0.0649)	(0.0650)
Retail		-0.148	-0.172
		(0.149)	(0.151)
Services		-0.0629	-0.0818
		(0.146)	(0.147)
Manufacturing		-0.0543	-0.0718
		(0.143)	(0.144)
Sole Proprietorship		-0.180***	-0.174**
		(0.0536)	(0.0536)
Country controls		Yes	Yes
Year controls		No	Yes
AIC	9739.1	6981.1	6957.4
BIC	9774.8	7099.4	7082.6
Observations	9366	7754	7754

Marginal effects; Standard errors in parentheses (d) for discrete change of dummy variable from 0 to 1; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The impact of trade sector reforms is negative and provides a reason for policymakers to rethink some of the reforms. From Figure **5**, trade sector reforms initially increase the likelihood of debt financing by 20 percent until a policy score of 3.5. Beyond a score of 3.5, progressive reforms in the trade sector reduce the probability by as much as 13 percent below the initial

rate, thereby negating the gains from the initial improvements. There is a repeat of the analysis for three countries in the sample to investigate potential heterogeneity in the results across countries. The countries include Rwanda, Angola, and the Congo Democratic Republic. Panels **A**, **B**, and **C** of Figure **6** shows the results. Again, there is heterogeneity in the
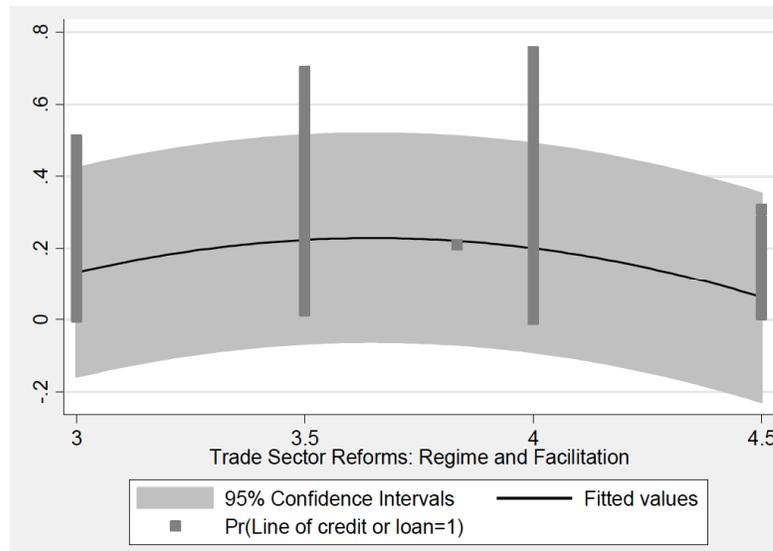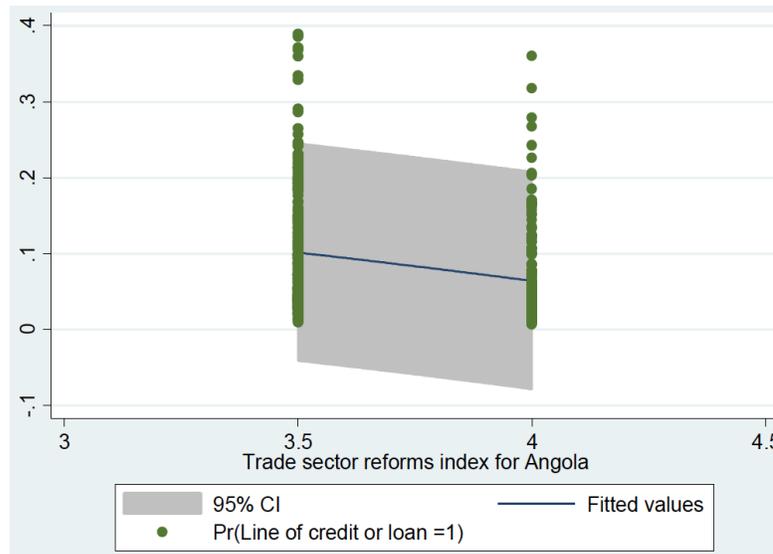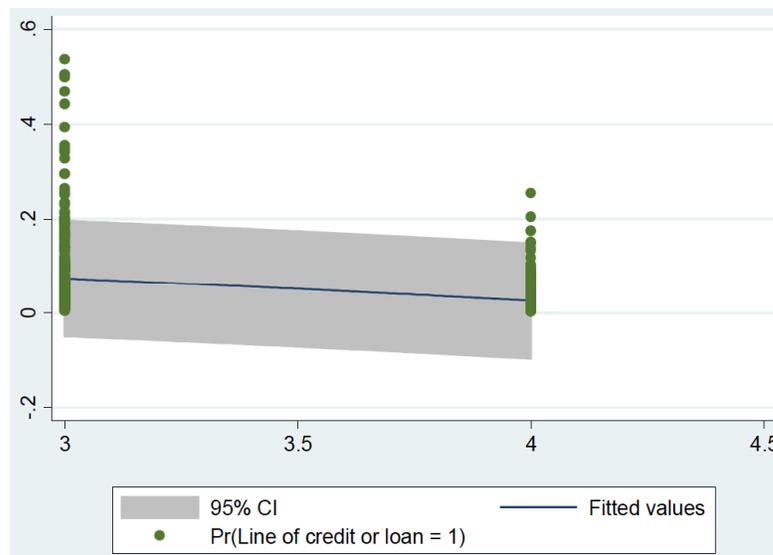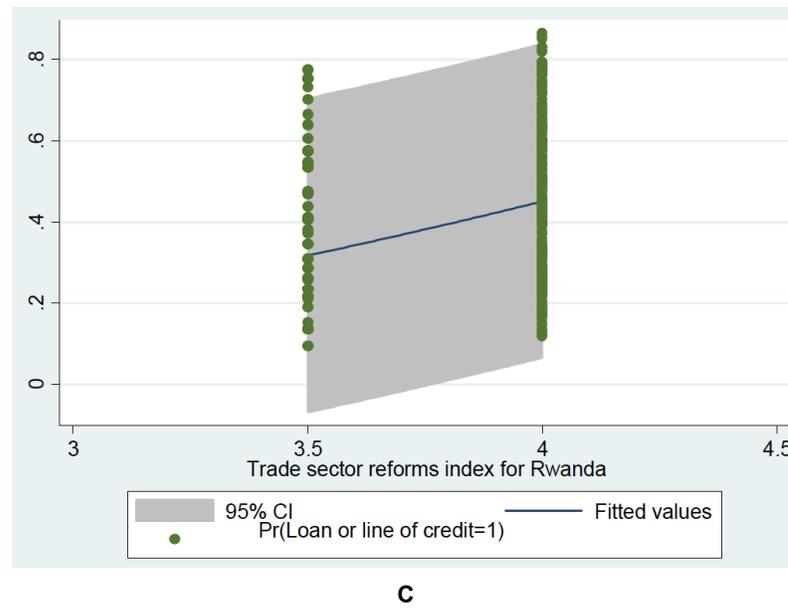
Figure 5: Trade Sector Reforms.

A

B

(Figure 6). Continued.

C

Figure 6: Panel A: Angola. **Panel B**: Democratic Republic of Congo. **Panel C**: Rwanda.

results. From **6A** and **6B** indicate that the marginal effects on access to debt financing for increases in the score in the trade sector are negative for Angola and Democratic Republic of Congo. However, as Figure **6C** shows, the effect is positive for Rwanda.

Table **6** present the marginal effects of the three-way error component model for the derived ordered outcome variable, s*tatus.* As reported, *reform* is statistically significant at 1 percent with a negative sign. The negative coefficient is indicative that progressive structural changes have the potential to ease debt financing constraints facing enterprises. Again, the control variables in the model do not have causal interpretations. Further, the qualitative inference from Table **6** is consistent with the results presented on the *credit* model.

5. ROBUSTNESS CHECKS

One threat to the internal validity of the econometric model is the problem of attrition—the non-responsiveness of a unit in the next wave, in this case, an enterprise, after the first round of data collection. A non-response could be due to the operation shutting down, or a refusal by the business to participate in the survey. It is not possible to tell ahead of time the cause of the non-response. As Baltagi (2012) notes, attrition can potentially distort the random sampling design. If the non-response is not random, inference from the analysis of the population can potentially be misleading as the data may not be representative of the population.

Testing for attrition follows Verbeek & Nijman (1992). The first step involves creating a dummy variable that takes a value of one if the enterprise is re-interviewed, and zero otherwise. This variable becomes an additional covariate. If the coefficient on the dummy variable has a p-value ≤ 0.05, the conclusion is that there is attrition bias. In the *credit* model, the dummy variable on attrition has a coefficient of -0.01, a standard error of 0.047, and a p-value of 0.830. In the *Status* model, the coefficient is 0.042 with a standard error of 0.026, and a p-value of 0.112. These results are indicative that there is not enough evidence to conclude that there is a problem of attrition in the model. Hence, inferences from the model are valid.

Cage (2013) has questioned the usefulness of the CPIA measures on policy performance. According to Cage, the CPIA policy variables positively correlate with output and are weak predictors of future economic growth. Consequently, to test the robustness of the results, there is a repeat of the analysis, using policy variables on Economic Freedom of the World Index (EFI) from the Fraser Institute, reported by Gwartney, Lawson, & Hall (2013). The following discussion draws heavily from Gwartney, Lawson, & Hall (2013). According to Gwartney, Lawson, & Hall (2013), the building blocks of economic freedom include "personal choice, voluntary exchange, freedom to entering markets and compete, and security of the person and privately owned property." Again, according to Gwartney, Lawson, & Hall (2013), the index depends

Table 6: Random Effects Probit Estimates for the Baseline *Status* Model

Dependent variable: *Status*					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
ln(*reform*)	-0.646***	-0.400***	-0.460***	-0.755***	-0.728***
	(0.103)	(0.108)	(0.112)	(0.160)	(0.160)
Private sector Cr/GDP		-1.171***	-1.180***	-0.975***	-0.813***
		(0.166)	(0.177)	(0.192)	(0.197)
ln(size)			-0.390***	-0.384***	-0.374***
			(0.0371)	(0.0371)	(0.0372)
ln(age)			-0.00856	-0.0104	-0.0106
			(0.0115)	(0.0116)	(0.0116)
Foreign-owned			-0.190***	-0.194***	-0.189***
			(0.0396)	(0.0397)	(0.0397)
Trade credit			-0.279***	-0.282***	-0.282***
			(0.0283)	(0.0283)	(0.0284)
Share traded			-0.182***	-0.198***	-0.233***
			(0.0373)	(0.0378)	(0.0395)
Female Manager			0.0232	0.0157	0.0234
			(0.0402)	(0.0404)	(0.0405)
Retail			-0.0627	-0.0880	-0.0753
			(0.0763)	(0.0771)	(0.0773)
Services			0.0510	0.0181	0.0300
			(0.0746)	(0.0759)	(0.0761)
Manufacturing			0.0940	0.0577	0.0666
			(0.0716)	(0.0731)	(0.0732)
Sole Proprietorship			0.0257	0.0181	0.0159
			(0.0338)	(0.0340)	(0.0340)
Country controls			No	Yes	Yes
Year controls			No	No	Yes
AIC	21069.1	21008.7	18427.3	18421.9	18416.3
BIC	21103.9	21050.4	18537.0	18538.5	18539.7
Observations	7756	7756	7010	7010	7010

Marginal effects; Standard errors in parentheses (d) for discrete change of dummy variable from 0 to 1; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

on 42 subcomponents grouped into five main areas. The five areas include "the size of government including expenditures, taxes, and enterprises; security of property rights; access to sound money; freedom to trade internationally; and regulation of credit, labor, and business." For this study, the last two constitute the relevant primary variables as they correlate with the policy variables from the CPIA reported earlier. The index involves data from the International Monetary Fund, World Bank, and the World Economic Forum. Each component and sub-component are rated on a scale of zero to 10, with ten corresponding to higher freedom.

Concerning *freedom to trade internationally*, the object is to measure the extent to which goods and services and financial assets can move across borders without impediments. The barriers take the form of tariffs, quotas, and capital controls. A country with low import tariffs and fewer capital controls gets a high rating. Within the sub-component on import tariffs, countries with no import taxes get a score of ten. However, countries with import taxes greater than 15percent get a zero rating. The *credit market and business regulations* component focus on the extent to which the regulatory environment constraints freedom of exchange in the credit, labor and goods markets.

Table 7:   Random Effects Estimates for Credit Model using EFW

Dependent variable: *credit*			
	(1)	**(2)**	**(3)**
ln(Freedom to trade)	-0.677***	-0.959***	-1.088***
	(0.117)	(0.147)	(0.151)
ln(Business environment)	1.622***	0.880***	0.787***
	(0.152)	(0.190)	(0.191)
Private sector Cr/GDP		1.857***	1.633***
		(0.290)	(0.293)
ln(size)		0.518***	0.493***
		(0.0636)	(0.0631)
ln(age)		0.110***	0.117***
		(0.0188)	(0.0193)
Foreign-owned		-0.170**	-0.176**
		(0.0614)	(0.0616)
Trade credit		0.606***	0.612***
		(0.0581)	(0.0585)
Share traded		0.0456	0.128
		(0.0609)	(0.0655)
Female Manager		0.126	0.114
		(0.0655)	(0.0653)
Retail		-0.311*	-0.357*
		(0.156)	(0.159)
Services		-0.246	-0.290
		(0.153)	(0.156)
Manufacturing		-0.213	-0.256
		(0.151)	(0.153)
Sole Proprietorship		-0.214***	-0.211***
		(0.0549)	(0.0549)
Country controls		-0.124**	-0.139**
Year controls		(0.0430)	(0.0436)
AIC	9802.4	7083.7	7072.2
BIC	9831.0	7195.0	7190.4
Observations	9366	7754	7754

Marginal effects; Standard errors in parentheses (d) for discrete change of dummy variable from 0 to 1; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

According to Gwartney, Lawson, & Hall (2013), countries with privately held deposits greater than 95 percent receive a score of ten. Countries with private deposits of between 75 percent and 95 percent get a rating of 8; between 40 percent and 75 percent get a score of 5; those between 10 percent and 40 percent, get a score of 2; those with private deposits of less than 10 percent get a score of zero. Also, concerning the labor market, countries that permit the forces of demand and supply in the labour market to determine

wages receive higher rating than those that do not. The subcomponent on the goods market is concerned with the ease or otherwise of entry and exit into an industry. Countries with regulations that facilitate entry and exit into an industry receive a high rating.

Table **7** presents the results for the *credit* model. The coefficient on the variable *freedom to trade internationally,* which is comparable to *trade sector reforms* in the CPIA is statistically significant at 1
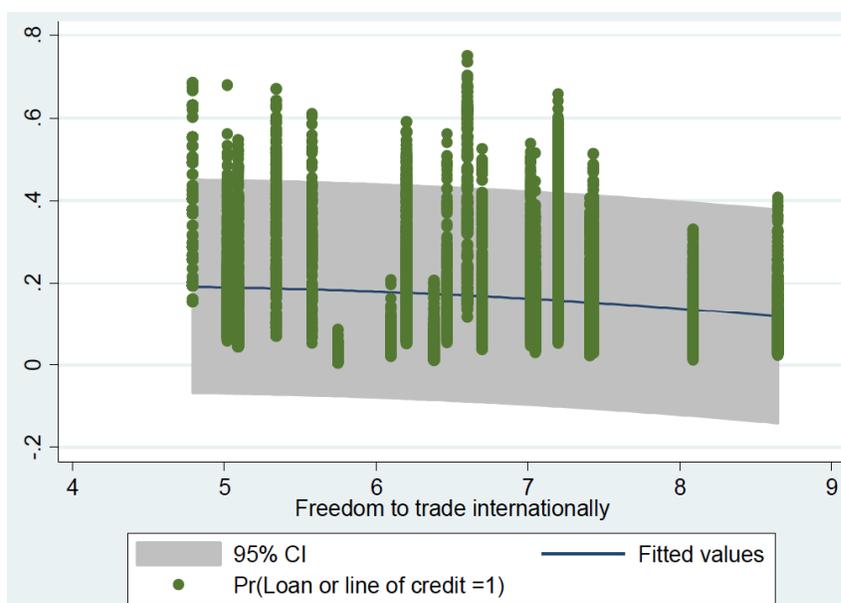
Figure 7: Freedom to Trade Internationally.

percent and with a negative sign, as expected. A 10 percent increase in the index on *freedom to trade internationally* reduces the probability of access to a line of credit or loan by 0.11. Numerically, the decrease of 0.11 from this result is different from the 0.33 reduction obtained from the policy variables from the CPIA, but the conclusion is the same: Reforms in the trade sector do not necessarily make it easier for enterprises to access debt finance. Figure **7** illustrates the results. Also, the coefficient on the variable *credit market and business regulations* is statistically significant at 1 percent with a positive sign. Again, qualitatively, this result is consistent with the results from the main model. A 10 percent increase in the variable *credit market and business regulations* increases the probability of access to debt finance by 0.08. The previous result using the policy variable from the CPIA is 0.05.

6. DISCUSSION AND CONCLUSIONS

The study examines the question: Are the structural policy reforms, supported by the World Bank effective in reducing debt financing constraints facing formal sector enterprises? Structural policy index (*reform)*, as defined by the World Bank, constitute the primary explanatory variable. It is an index consisting of the trade sector, financial sector, and reforms in the business regulatory environment. The results are indicative that taken together; structural policy reforms reduce debt financing constraints facing enterprises, at least, as it pertains to their working capital needs. There is heterogeneity in the results. Changes in the

business regulatory environment benefit large firms more than small ones. Financial sector reforms affect enterprises of all sizes relatively equally. There is additional heterogeneity in the consequences of trade sector reforms. For all the twelve countries, together, trade sector reforms initially increase the likelihood of debt financing by 20 percent until a policy score of 3.5. Beyond a score of 3.5, progressive reforms in the trade sector reduce the probability by as much as 13 percent, thereby negating the gains from the initial improvements. Also, not all countries experience the same effects from trade sector reforms. Improvements in the score on trade sector reforms have adverse effects on the probability of access to debt finance by enterprises in Angola and Democratic Republic of Congo, for instance. However, the effect is positive for Rwanda.

The problem is, the reforms prescribed by the World Bank in most of the countries in sub-Saharan Africa are uniform. As demonstrated, the reforms supported by the World Bank are not making the anticipated impact, at least in the credit market and the effects are not uniform across countries. The results on the impact of trade sector reforms provide an opportunity to rethink some of the policies promoted in developing countries. For instance, according to the guidelines for the CPIA rating on trade sector reforms, a country gets a score of one if the average most favored nation (MFN) tariff in addition to all other import taxes is above 20 percent, and with peaks above 50 percent. A country gets a score of three out of six if the average MFN in addition to all other import taxes is between 15-20 percent, and

receives a rating of four out of six if the import tax is between 10 and 15 percent. A country gets a score of six if the average MFN tariff in addition to import taxes is 5 percent. The results of the study are indicative that, reducing the average most favored nation tariff in addition to all other import taxes below 15 percent could negatively affect local enterprises due to the potential competition from imports. The competition makes the balance sheets of the local businesses worse, thereby making it harder to attract debt financing.

On the other hand, there is empirical support for continuous reforms in the business regulatory environment and the financial sector. Reforms in the financial sector could involve expansion of credit to the private sector, encouraging the expansion of branch networks of financial institutions. The changes could also mean opening up of capital markets for international investment, and enacting laws that promote diversification of financial markets. Reforms could also include improvements in records on information about credit history and property registration. Further changes could mean promoting competition in the banking sector to avoid bank concentration, and discouraging the tendency of commercial banks to hold government debt instead of lending to private enterprises. Potential reforms could involve promoting competition in the industry, and changes that cut the cost and time of doing business, which also includes the cost of starting one. These changes are essential to reducing poverty and promoting economic growth in developing countries.

As a result of the identification strategy adopted, the study had some limitations. The analyses involve panel data models. However, there were only two data points (T = 2) for each enterprise in the sample. For instance, for enterprises in Tanzania, the first data collection occurred in 2006, while the second took place in 2013. The study could have benefited a lot from more data points. However, notwithstanding this limitation on the data, the results are empirically robust.

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