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SECTOR LENDING CONCENTRATION AND CREDIT RISK: AN EVALUATION OF LENDER PERCEPTIONS IN TANZANIA

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ABSTRACT

This study contributes to the debate on the effect of Lending Concentration (LC) on credit risk. It is based on data from an online survey of 151 employees from 37 lending institutions, employees with diverse experience in the different sections of their institutions. Following a successful three-factor solution on LC based on an Exploratory Factor Analysis, Binary logistic regression models were implemented to determine the Perceived Lending Risk (PLR) based on three types of LC, namely Social Status Lending Concentration (SSLC), Private Sector Lending Concentration (PSLC) and Public Employee Lending Concentration (PELC). It was noted that over-concentration based on social status provided an explanation for the increase in Non-Performing Loans (NPL) risk among both large and small lenders. Since Lending Concentration reverses the effect of macroeconomic variables, such as credit risk management practices (CRMPs), Credit Processing Considerations (CPCs), as

well as collateral types, assessing the degree at which the lender is concentrated across sectors is imperative, prior to any credit risk management initiative. Although LC directly affects lending risks perceptions alongside the traditional and corporate finance theories, the indirect LC effect via CRMPs, CPCs, bank size and originality, as well as the various collateral typologies seems to provide new insights into this area of research.

Keywords: Lending concentration, non-performing loan, credit risk, credit risk management, bank lending and borrowing.

JEL Classification: G21.

INTRODUCTION

Banks and other financial intermediaries exist partly because borrowers often have more information on their respective abilities to finance the loans than lenders (Mol-Gómez-Vázquez, et al., 2018). Borrowers' advantage over information of projects requires monitoring by lenders to ensure that borrowers abstain from acting in their own self-interest (Abu Hussain & Al-Ajmi, 2012). However, lenders may fail to accurately predict the behavior of borrowers, leading to the huge accumulation of Non-Performing Loans (NPL) Ugoani, 2016; URT, 2019; Francisa et al., 2018; Le & Diep, 2020; Berger et al., 2017). As monitoring is also costly, financial intermediaries must rely on Credit Risk Management Practices (CRMPs) to allow credit information production and monitoring (Purda, 2008).

According to the Bank for International Settlements (2006), two forms of LC can be identified; the first is "name concentration", which relates to the imperfect diversification of idiosyncratic risk in the portfolio, either because of its small size or because of large exposures to specific individual obligators (Beck & de Jonghe, 2013); and the second is "sector concentration", which is synonymous to imperfect diversification across systematic components of risk, namely sectoral factors (Simpasa & Pla, 2016). Along these lines, diversification may be associated with relatively higher lending risk, especially when venturing into new and competitive markets (Le & Diep, 2020; Adzobu et al., 2017). Diversification may also induce a higher NPL risk via the reduced incentives to monitor in response

to agency conflict between equity holders and creditors of the lender (Adzobu et al., 2017; Paravisini et al., 2015; Beck & de Jonghe, 2013; Acharya et al., 2006). Beck and de Jonghe (2013) however, suggests that LC causes higher lending risks among Banks. To date there is no consensus despite the acknowledgement that LC increases information at the cost of higher portfolio risk, thus may not necessarily yield overall lower Perceived Lending Risk (PLR) among lenders (Berger et al., 2017).

At least two theoretical perspectives have been used to explain LC risks facing financial institutions. The first pertains to the standpoint of Traditional Portfolio Theory (TPT), which suggests that diversification, whether across lending sectors or name/products, and services, provide an opportunity for lenders to mitigate PLR. From the perspective of the TPT, LC is susceptible to the economic volatility of the sectors of LC than when they are well diversified (Adzobu et al., 2017). The TPT's suggestions are in favor of diversification, principally drawing from Markowitz (1959) and supported by Diamond (1984).

The second theoretical perspective pertains to a tenet of Corporate Finance Theory (CFT) which claims that most of the LC effects accrue from the built-in nurturing of expertise (Francisa et al., 2018). According to the CFT, lenders should specialize by concentrating their activities on specific sectors, or lines of business in order to enjoy the comparative advantage of developing expertise in the areas of their focus (Jensen, 1986; Denis, Denis, & Sarin, 1997; Adzobu et al., 2017). The CFT has suggested that LC can also result in better screening of potential borrowers and loan applications, and there is more efficiency in monitoring, hence leading to a lower NPL risk (Beck & de Jonghe, 2013). LC gives room for experienced expertise to develop, thus facilitating detection of deteriorating businesses early and taking the necessary appropriate measures (Adzobu et al., 2017; Böve et al., 2010). Similarly, it might be possible to prevent risk shifting by borrowers (Beck & de Jonghe, 2013).

This study intends to contribute to the debate on the effect of LC on NPL risks by evaluating lender's perceptions on lending risks and the associated degree of LC. Despite the abundant literature on LC and diversification in the developed world, little is known with regard to developing countries, mainly because of the problem of limited data (Abu Hussain & Al-Ajmi, 2012; Adzobu et al., 2017). For example,

Tanzania experienced a credit crunch and lenders suffered from huge losses as a result of the high NPL rates (Richard et al., 2008). Similarly, lending has been concentrated more on the secondary rather than primary sectors (Kira, 2013), whereby the incorporated companies have more chances of getting loans than the unincorporated ones. With regard to the CRMPs, the Bank of Tanzania (BOT) requires each lending institution to prepare a comprehensive Risk Management Programme (RMP) designed to its needs and circumstances under which it operates (BOT, 2010).

Despite the treatment provided through the CRMPs, the BOT (2019) has reported that the NPLs ratio declined to 9.8 percent from 10.4 percent, which however, was still above the desirable level. Since the Tanzania's lending market has been highly concentrated (IMF, 2018), it is possible that LC could be responsible for the persistently higher NPL rates. Efforts to curb the NPL through the CRMPs and credit considerations in Tanzania seemed to be massive, but the NPL's responses seemed to be very marginal. This study is carried out under the assumption that the NPL does respond to certain specific lending considerations and the CRMPS, but not to all of them despite the fact that all are intended to lower the NPL risk.

LITERATURE REVIEW

Sector Lending Concentration

Sector specific observations in Vietnam and Lithuania have suggested that LC in sectors such as agriculture, manufacturing, transport and communication, construction and real estate and other community-wide sectors (electricity, gas and water) has been associated with higher Perceived Lending Risk (PLR), compared to service sectors such as housing, hotels and restaurants (Le & Diep, 2020; Pham & Lensink, 2008; Skridulytė & Freitakas, 2012). Simpasa & Pla (2016) provided evidence that for sectors where commercial lenders had high LC, i.e., Private Sector Lending Concentration (PSLC), the corresponding NPL risk tended to be lower to reflect monopoly rents accruing from superior information and monitoring efficiency or expertise in a given sector. These observations though contradictory, have pointed to the hypothesis that PLR might be low in the PSLC than in other forms of LC.

Social Status Lending Concentration (SSLC) describes LC in terms of individual characteristics (Hunter & Nixon, 1999). Theoretically, the existence of at least one major customer/borrower who accounts for 10 percent or more of the supplier's induces a high PLR among lenders (Liu et al., 2019). Beck and de Jonghe (2013) observed that individual lender differentiation would contribute to more system-wide risks in the financial system. Under the SSLC, borrowers might transfer a part of their businesses' achieved results to reduce the financial expenses associated with loan repayment (Laib, 2013). Similarly, in some western countries an individual's share of the NPL would be determined by external factors, i.e., institutional quality or lack of adequate CRMPs by lenders, which could contribute further to a higher NPL risk (Hunter & Nixon, 1999; Skridulytė & Freitakas, 2012; Liu et al., 2019). Pham and Lensink (2007) has suggested that in developing countries, an individual's share of the NPL might be linked to informality, whereby formal employment borrowers were more likely to default than their informal counterparts. These notable findings seem to suggest support for the hypothesis that the SSLC could be associated with a high or low PLR depending on the context.

The Public Employee Lending Concentration (PELC) on the other hand, may be considered the safest given the certainty in income flow (Le & Nguyen, 2018; Pham & Lensink, 2008). Liu et al. (2019) and Yang (2017) however observes that, LC is associated with higher interest rate among bondholders to reflect the need to compensate for a higher PLR. Instead of reducing loans, lenders are more likely to increase monitoring through a shorter-term debt when facing a higher PELC (Yang, 2017). Borrowers' occupation in lending (lenders) also reduces default risk (Pham & Lensink, 2008). As such, it is hypothesized that the PELC is associated with a relatively lower PLR, compared to other sectors.

The Macroeconomic Environment

In addition to LC, macroeconomic conditions may contribute to increasing the NPL risk (Beck & de Jonghe, 2013; Trautmann & Vlahu, 2013). The channel through which LC can lead to a higher PLR can be via loan losses and difficulties in managing interest rate risk (Paravisini, Rappoport, & Schnabl, 2015; Beck & de Jonghe, 2013; Le & Diep, 2020). Lassoued (2017) notes that while GDP growth generally reflects higher income flows for small borrowers and an

increase in the profitability of firms, and therefore, better solvency, higher inflation rates constrain households in their consumption freedom. Similarly, both the GDP and inflation experience affect the NPL because of either lost lending relationship in times of low growth (Trautmann & Vlahu, 2013), or weak institutions or repeated crises where the contagious aggravation of crises are through word-of-mouth (Trautmann & Vlahu, 2013; Iyer & Puri, 2012).

In terms of perceptions, psychological studies in the so called 'Pollyanna Principle' (Dember & Penwell, 1980), have well established that even with limited information, better fortunes are often perceived better (overstated) while misfortunes are perceived worse (understated) (de Meza & Southey, 1996). Therefore, a booming economy might signal a higher repayment ability, thus attracting more borrowing even where actual repayment is not guaranteed.

Lender Specific Characteristics

Kira (2013), Al-kayed (2020) and Abu Hussain & Al-Ajmi (2012) have suggested that lender typologies (Islamic and non-Islamic) determine the type and level of credit risk facing a financial institution. Furthermore, relatively larger lenders tend to experience a higher NPL risk from loan loss provisions (Adzobu et al., 2017). However, if a large lender is diversified rather than concentrated, the ability to grab economies of scales is enhanced, leading to a relatively lower PLR than that achieved by smaller lenders (Beck & de Jonghe, 2013). In contrast, Simpasa and Pla (2016) have suggested that there would be a higher NPL risk in response to LC, regardless of a lender's size. In addition, in another study by Lassoued (2017), it was suggested that lender size had an insignificant effect on the PLR. The effect of bank size based on these studies could be either positive or negative, it depended on other factors. Similarly, the experience of the lender might affect risk perceptions. From the viewpoint of institutional memory hypothesis, whereby the less experienced key decision makers are, the higher the likelihood of lending risks underestimation (Burakov, 2014; Berger & Udell, 2004).

Credit Processing Considerations

A number of credit processing considerations may be pivotal in reducing the PLR. The first is existing debt (CDebt), which however, is rarely considered important to Microfinance Institutions (MFIs) and

Small and Medium Enterprises (SMEs) who rely on soft information (Abdulsaleh & Worthington, 2016; DeZoort, Wilkins, & Justice, 2017; Lassoued, 2017; Harif, Hoe, & Zali, 2011; Berger, Minnis, & Sutherland, 2017). The second is income, capacity and savings, all of which captures the ability of the borrower to meet the periodic repayment of the interest and principle (Adzobu et al., 2017; Laib, 2013; Abdulsaleh & Worthington, 2016; Koomson et al., 2016). There were cases however, where these capacity-related considerations had not been significant (Lassoued, 2017). With regard to income (CIncome) the PLR tended to be relatively lower among high-income borrowers than low-income ones, thus providing an explanation for credit refusal among the poor (Le & Nguyen, 2018; Pham & Lensink, 2008; Koomson et al., 2016); and Credit history (CredH) (Abdulsaleh & Worthington, 2016).

Additional considerations included concerns with collaterals (CColla) and business plan (CBplan) (Abdulsaleh & Worthington, 2016). Both of these reflected the applicant's creditworthiness and borrower's character, especially in the context of lending to highly risky sectors, such as the MFIs and SMEs (Abdulsaleh & Worthington, 2016; Laib, 2013; Pham & Lensink, 2007). Other concerns being demographics, such as age whereby, the older are considered less risky (Koomson et al., 2016; Kira, 2013); the number of dependants, i.e., the more the number of dependants, the higher the PLR (Koomson et al., 2016; Pham & Lensink, 2007); and education, thereby those with a vocational or university degree would be associated with a low PLR (Kira, 2013).

Further considerations include the purpose of the loan (LoanPur) and borrower's employment status (CEmploy). Studies by Le and Nguyen (2018), Klyuev (2008) and Harrison et al. (2004) have suggested that the PLR depended on the stability of income and borrowers' business experience. It was found that those with higher business experience were associated with a low PLR (Kira, 2013), though Abdulsaleh and Worthington (2016) noted that if the loan was for a startup, experience was irrelevant.

Credit Risk Management Practices

Lenders mitigate credit risk by using several practices, including the following: Risk-Based Pricing (RBP) to diversify risk when lenders charge a high interest rate on risky borrowers (Wood & Kellman,

2010); impose Different Bank Covenants (DBC) to borrowers to reflect borrowers' creditworthiness (Choppari & Rajeshwar, 2015; Liu et., 2019; Campello and Gao, 2017); use of Credit Insurance for Loan Granted (CILG) to transfer risk from the lender to the seller (insurer) in exchange for payment (Prasad, 2016); the use of Credit Reference Bureau (CRB) to assess credit history of borrowers (Ondabu, 2019); Credit review (Crev) of borrower income to assess current creditworthiness; bank Guarantee to Cover Debt (GCD) in case of default; Unlock loan of potential borrowers upon request (LPB) (Seyram, 2013); transfer of loan to another bank; offer private banking to specific borrowers; and differential consideration of individual borrowers based on their employment status. The last three have however not been investigated with regard to its PLR effect.

Different Collateral Types

Provision of collateral for many lenders is a policy issue, without it the loan application is most likely to be rejected (Abdulsaleh & Worthington, 2016). Different types of collateral are accepted by lenders including the following: real estate, machinery, equipment and vehicles, products and goods (inventory), personal guarantees and accounts receivable (Abdulsaleh & Worthington, 2016). Banks require a collateral in order to address any adverse selection (Chan & Thakor, 1987; Stiglitz & Weiss, 1981), and the moral hazard problem. It is a means to monitor borrowers' behavior and ensure the success of the project for which the loan was granted (Aghion & Bolton, 1992). In rare cases, the collateral may indicate the purpose of the loan, thus increasing the safety margin of the lender (Abdulsaleh & Worthington, 2016). The NPL risk reduction effect of these different types of collateral is however, a matter of empirical observations.

Theoretical Determinants of Perceived Lending Risks

The conceptual model for this study is as provided in Figure 1. Figure 1 shows that enhancing the intensity of the use of the CRMPs have a positive and significant impact on the PLR, while reducing such intensity increases the lender's PLR. LC also shapes the PLR, however, its effect is not direct as LC is moderated by multiple exogenous variables. Thus, enhanced lender's LC in a particular sector leads to significant PLR reduction, only if such LC is also associated with favorable perceptions on the Macroeconomic Environment (ME), Borrower Differentiation (BD) via credit processing considerations and Bank/Lender Characteristics (BC).

Figure 1

Conceptual Model of Determinants of Lenders' Perceived Lending Risk (PLR)
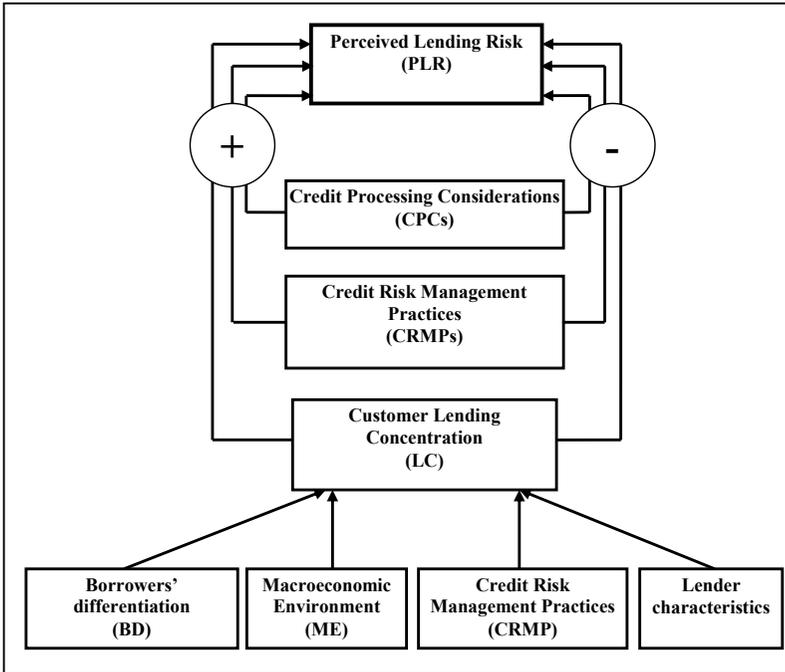
METHODOLOGY

To evaluate the relationships portrayed in Figure 1, an online survey was distributed to lenders via Google forms from August 2020 to March 2021. The contact details of all respondents were obtained based on online social media, specifically LinkedIn and the personal contact details of the authors. The study also utilized a limited secondary data, specifically macroeconomic data from the World Bank Development Indicators to compute the GDP and inflation experience.

Data Description

By 2015, Tanzania had 63 banks and other financial institutions, of which 36 were Commercial banks, 12 were Regional and Co-operative banks, three (3) were financial institutions, three (3) were

Microfinance banks, two (2) were Development Financial institutions, one (1) was the Tanzania Mortgage Refinancing Company, three (3) were Finance Leasing, one (1) was a Representative bank and two (2) were Credit reference bureau1[1]. Major commercial banks, such as the NMB Bank, CRDB Bank Ltd and Akiba Commercial Bank (ACB) have established considerable presence in rural productive sectors such as in agriculture. The TPB Bank has a countrywide network of post offices, which could facilitate savings mobilization and money transfers. In addition to banks and financial institutions, Tanzania also has several MFIs, which are registered by different authorities and legislations2[2].

The total number of employees in these banks, financial intermediaries and Micro-Finance Institutions (MFIs) is however, not determined for the purpose of this study. Hence a convenient sampling strategy was adopted. Similarly, since the focus of this study was on the experience of the lenders' operatives through employees, it was necessary to capture the experience of the employees, given their current and previous employments. In sum, the experience of the respondents in the lending industry was of prime importance in this study.

The questionnaire instrument was divided into four major parts; the first intended to capture basic information about the respondents and lenders, such as their work experience and in which types of employment departments. The second part captured the CRMPs in detail, using a five point Likert scale to gather the associated reasons for practice variation across lenders. The third part paid some specific attention to practices such as the CRB and loan insurance3[3]. The fourth part captured considerations in granting loans, risk mitigation strategies, as well as LC across sectors. The last part captured the collateral types relevant to credit processing.

To maximize the probability of getting new insights into the dynamics of the lending market in Tanzania, this study has shown a preference for more than one respondent per lender, with varying experience, although several non-bank financial institutions had provided only a single response. When the survey was ended, a total of 151 respondents from 36 lending institutions had returned the duly completed questionnaire. Out of the 36 lending institutions, 33 were banks while four were non-bank financial institution. The detailed classification of the sample of financial institutions and the number of

respondents is provided in Appendix 2, while a summary of the data used for this study is provided in Appendix 1.

Data Analysis

The framework in Figure 1 was operationalized through a four-stage analysis:

i)   The preliminary LC and PLR indices were computed based on the mean transformed scores of the Likert scale indicators, and based on equation 1.

$$Index_i = \sum_{i=1}^{I} \frac{AFS_i/MPFS_i}{\sum_{n=1}^{N} AFS_{in}/\sum_{n=1}^{N} MPFS_{in}} \qquad [1]$$

Where

AFS_i is the *Actual factor score i*

$MPFS_i$ is the *Maximum possible score* for indicatoor i

N is the total number of respondents in the sample (max 151)

ii)   In the second stage, Exploratory Factor Analysis (EFA) was used to identify three perceived Lending Concentration (LC) sectors – i.e., SSLC, PSLC and PELC based on responses on a total of 15, five point Likert scale questions on the level for which the loans market was sought to be concentrated along pre-identified areas of economic activities (see Figure 2 & Figure 3).

iii)   In the third stage the significant determinants of the LC were established and dummified (scores above average =1, 0 otherwise) from factors loadings in (ii) based on the three-factor Principle Components (PCs) scores as dependent variables and the independent variables summarized in Figure 1. Using binary logistic regression, four equations have been estimated for this purpose. The binary logistic model for this purpose has been specified as;

$$LC_{is} = ln\left(\frac{\pi_{is}}{1-\pi_{is}}\right) = \beta_0 + \beta_1 ME_j + \beta_2 BD_{ik} + \beta_3 BC_{il} \qquad [2]$$

Where,

$$\pi_{is} = \frac{e^{\beta_0+\beta_1 ME_j+\beta_2 BD_{ik}+\beta_3 BC_{il}}}{1 + e^{\beta_0+\beta_1 ME_j+\beta_2 BD_{ik}+\beta_3 BC_{il}}}$$

π_{is} refers to the probability of LC facing a bank as perceived by lender i;

LC_{is} is the dummy for perceived LC score based on factor loading greater than average for lender i in sectors.

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ME_j refers to the jth measurement of a macroeconomic variable. In this case inflation and growth experience. These two measures were the average for the period under which the respondent i has been in the lending industry. For example, the growth experience ME_{ig} is computed as $ME_{ig} = \frac{1}{G}\sum_{g=1}^{G} G_{ig}$. G_{ig} is the GDP growth rate during the respondents' years of experience from the year of entry $g = 1$ to the current year $g = G$. BD_{ik} being the kth measurement of the borrowers' differentiation variables as perceived by lender i; and BC_{il} being the lth measurement of borrower characteristics, as perceived by lender i.

iv) In the final stage, the sector's prediction of LC in equation 2, for each respondent i who has worked at lender (PLR_{is}^1), were then combined in another set of binary logistic regressions for low (up to 20% NPL) and high risk (over 20% NPL) perceptions (PCRs) as dependent variables. Other levels of the PLR have been included for clarity.

RESULTS

General Observations

At the core of this study is the overall effect of LC on the NPL risk, as presented in Figure 2 and Figure 3. The findings presented thus far, have found support from the study by Pham and Lensink (2008), where the SLC which was in favor of individual establishments had a lower PLR perception, an indicator that the SSLC could be justified as a low-risk lending avenue in Tanzania. The fact that the SSLC accrued a low PLR seemed to suggest that the lending could be along social networks (Pham & Lensink, 2007), which if not trustworthy might plunge the banking sector into serious exposure and could provide the reason for the ever-increasing NPL rates. This observation is however, contrary to western studies which have associated individual lending to a relatively higher PLR than corporate borrowers (Beck & de Jonghe, 2013; Liu et al., 2019; Laib, 2013; Hunter & Nixon, 1999).Figure 3 provides the scores of the various PLR per sector. By comparing it with Figure 2, it is evident that high LC and high PLR sectors include SMEs, CBD businesses and non-partner individual borrowers. The low LC and low PCR sectors were DSM private sector organizations, interbank lending, as well as state corporations.

Figure 2

Perceived Customer Lending Concentration Across Sectors
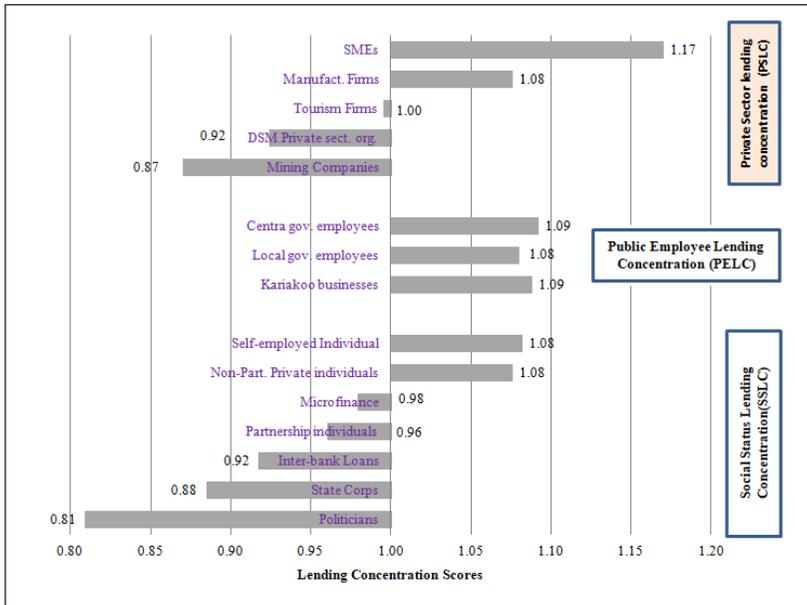
Furthermore, the observations have suggested that sectors where the PLR was relatively high, had included the commercialized sector where expectations based on Simpasa and Pla (2016) were swayed in favor of the low risk. The observations to the contrary have suggested the possibility of a SSLC induced PLR, whereby low risk sectors might be perceived risky if lending concentration exceeded a certain threshold. This study however, did not venture more into the threshold effect of LC. Thus, this research avenue is reserved for future studies. The PSLC is also a better option than the PELC, contrary to the long-enshrined belief that those with employment and permanent income were perceived to be relatively less risky (Le & Nguyen, 2018; Pham & Lensink, 2008; Koomson et al., 2016). In this study however, income was not observed to be an important consideration during loan processing, while employment considerations have induced a relatively high rather than low PLR, contrary to the findings in Le and Nguyen (2018); Klyuev (2008) and Harrison et al. (2004). This was perhaps due to the fact that the government employee lending market could be oversaturated, or that lenders would consider the employment of the borrower only when they believed or faced a high NPL risk.

Figure 3

Perceived Credit Default Risk across Sectors
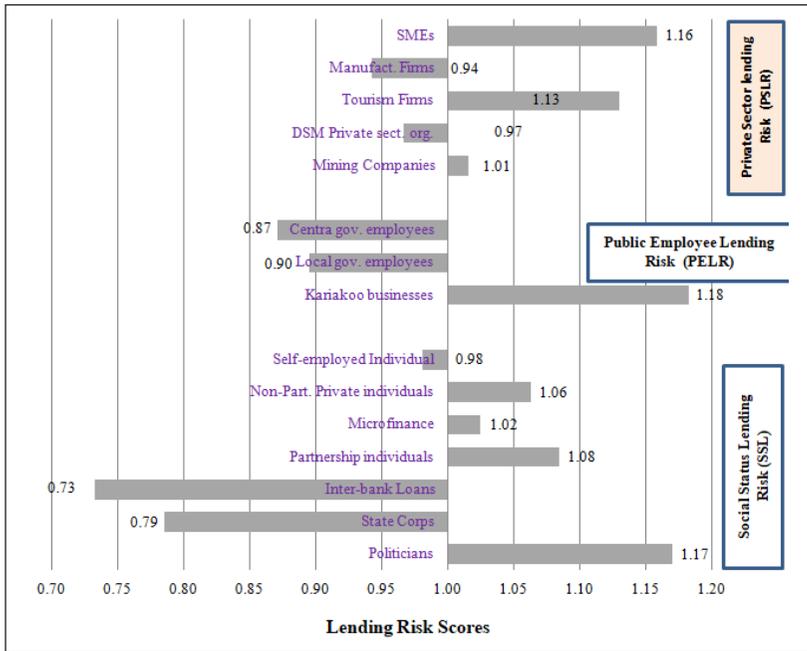
Table 1

Descriptive Statistics for Variables in the Final Models

S	Variable name	N	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
A				Perceived Non-performing loans risk				
A1	below 10%	150	.12	.94	.58	.20	-.11	-.96
A2	between 10 - 20%	133	.00	1.00	.45	.31	.29	-1.18
A3	below 20%	150	.13	.98	.64	.24	-.27	-1.06
A4	20 - 40%	128	.00	1.00	.63	.37	-.55	-1.31
A5	Over 40%	142	.00	1.00	.52	.39	-.16	-1.61
A6	Over 20%	151	.00	1.00	.47	.50	.12	-2.01
B				Lender's/Respondents' Characteristics				
B0	Size large	151	0	1	.47			
B1	Local_large	151	0	1	.36			
B2	Org. Local	134	0	1	.54			
B3	GIANT_2	151	0	1	.15			
B4	GIANT_3	151	0	1	.05			

(continued)

S	Variable name	N	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
B5	GIANT_1	151	0	1	.13			
B6	OIB	151	0	1	.17			
B7	OLB	151	0	1	.13			
B8	Back	151	0	1	.74			
B9	Manage	151	0	1	.22			
B10	Credit	151	0	1	.25			
B11	Administration	151	0	1	.16			
B12	RiskF	151	0	1	.27			
B13	Operations	151	0	1	.56			
B14	Exper	143	1.00	25.00	6.97	4.23	1.37	2.78
C				Macroeconomic Environment (ME)				
C1	Grow_Exper	143	3.45	1.46	5.64	1.68	.65	-.23
C2	Infl_Exper	143	5.62	6.41	6.14	.22	-1.42	.87
D			Lenders application of Credit Risk Management Practices (CRMPs)					
D1	CILG	151	.24	1.21	1.00	.27	-1.20	.56
D2	DCB	151	.00	1.31	1.00	.29	-.85	.40
D3	GCD	151	.30	1.51	1.00	.38	-.27	-.96
D4	Crev	151	.00	1.19	1.00	.28	-1.48	1.65
D5	LPB	151	.00	1.44	1.00	.36	-.60	-.07
D6	PBB	151	.00	1.27	1.00	.30	-.94	.08
D7	RBP	151	.00	1.32	1.00	.31	-.91	.51
E				Considerations in credit processing				
E1	Age	150	.00	1.38	1.01	.40	-.96	.10
E2	BusExp	150	.00	1.30	1.00	.36	-1.43	1.52
E3	CCap	150	.00	1.26	1.01	.34	-1.68	2.35
E4	CDebt	150	.00	1.21	1.01	.31	-2.00	3.76
E5	Cdep	150	.00	1.91	1.01	.55	.06	-.81
E6	Charct	150	.00	1.26	1.01	.37	-1.55	1.39
E7	Collat	150	.00	1.22	1.01	.33	-1.84	2.83
E8	Employ	150	.00	1.32	1.01	.37	-1.27	1.06
E9	Loanpur	150	.00	1.25	1.00	.35	-1.57	1.73
E10	CredH	150	.00	1.18	1.01	.31	-2.13	3.93
F				Lender's use of different collateral types				
F1	Land	150	.00	1.47	1.01	.43	-.73	-.30
F2	PCP	150	.00	1.57	1.01	.39	-.65	.41
F3	CP	150	.00	1.80	1.01	.57	.01	-1.28
F4	BSA	150	.00	1.84	1.01	.60	.03	-1.35
F5	Invent	150	.00	1.61	1.01	.42	-.67	.28
F6	Lien	150	.00	1.61	1.01	.42	-.55	.01
F7	Invoice	150	.00	1.57	1.01	.41	-.64	.12
G				Customer Lending Concentrations (LC)				
G1	SSLC	150	.01	.99	.57	.32	-.39	-1.21
G2	PSLC	142	.00	.99	.56	.29	-.31	-.92
G4	PELC	142	.01	.99	.56	.26	-.27	-.84

Descriptive Statistics

To analyze the relationship between the PLR and LC, it was necessary to first establish a quantitative measure of LC based on the 15 items evaluated in the questionnaire. Factor analysis suggested a three-factor solution, in which their respective principal components were considered as SLC indicators. Prior to further analyses, descriptive statistics have been considered in Table 1. It can be observed that some variables were skewed with a kurtosis value being far away from zero, thus calling for methods other than linear regression in determining the predictors. The dispersion was however not very alarming, as it seemed to suggest some stability.

Table 2

Determinants of the Different Levels of PLR (LOW) Models Summary

	Model Fit			Model Classification		
				No	Yes	Overall
NPL <= 10 percent	-2 Log likelihood	149.98	No	30	20	
	Cox & Snell	0.17	Yes	23	55	
	Nagelkerke	0.23	Percent	56.6	73.33	66.41
NPL = 20 - 40 percent	-2 Log likelihood	120.09	No	59	15	
	Cox & Snell	0.36	Yes	10	44	
	Nagelkerke	0.48	Percent	85.51	74.58	80.47
NPL > 40 percent	-2 Log likelihood	131.8	No	23	9	
	Cox & Snell	0.23	Yes	21	75	
	Nagelkerke	0.31	Percent	52.27	89.29	76.56

Determinants of the PLR

Table 2 and Table 3 provide the summary information for "Low" and "High" PLR models respectively. From Table 2, it can be seen that the pseudo R^2s were adequately high and provided an acceptable classification of cases, all being beyond 75 percent for two (2) models. However, the first one was below acceptable standards. This provides an indication of good model fit for the last two (2) models and a justification for further interpretation of the results. On the high NPL, risk perception, the pseudo R^2; i.e., correlation and the classification

table are provided in Table 3. All the models are generally fit and provide at least 85 percent classification accuracy.

Table 3

Determinants of the Different Levels of PLR (HIGH) Models Summary

Model fit			Model Classification			
				No	Yes	Overall
NPL <= 10 percent	-2 Log likelihood	74.71	No	40	5	
	Cox & Snell	0.52	Yes	7	76	
	Nagelkerke	0.71	Percent	85.11	93.83	90.63
NPL = 20 - 40 percent	-2 Log likelihood	85.22	No	52	10	
	Cox & Snell	0.51	Yes	9	57	
	Nagelkerke	0.68	Percent	85.25	85.07	85.16
NPL > 40 percent	-2 Log likelihood	79.94	No	30	6	
	Cox & Snell	0.47	Yes	11	81	
	Nagelkerke	0.65	Percent	73.17	93.1	86.72

The Effect of Lender and Employee Characteristics

With regard to employee characteristics, this study would like to suggest that those in management and those with a relatively broader experience in the banking industry have a higher PLR, an observation which is in line with the experience hypothesis, and which has also been suggested in Dember and Penwell (1980) and de Meza and Southey (1996). A study in URT (2019) has suggested that Tanzania is facing a higher NPL risk and that employees in the credit department are more aware of this. Unexpectedly however, it was further noted that employees in the credit department have suggested a significantly lower NPL risk. It is evident here that risk is overstated by those in management, as they view it as bad to their organization (de Meza & Southey, 1996), while those in operations (credit) understate risk as they prefer being optimistic in order to encourage borrowing. Further analysis among those in the credit department has further suggested that they also understated risk. This was because on average, they had less experience across LCs, which is an expected form of behavior (Burakov, 2014; Berger & Udell, 2004).

Table 4

Binary Logistic Model Results from Determinants of "LOW" PLR

	Less than 10% NPL		Between 10 - 20 % NPL		Below 20% NPL	
	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
Constant	0.53		0.13		0.45	
	(0.70)		(1.32)		(0.77)	
A	Lender/Respondent Characteristics					
OrigLocal(1)			4.03	*		
			(0.81)			
Sizelarge(1)			14.89	***		
			(0.93)			
Local_large(1)			0.03	***		
			(1.27)			
GIANT_3(1)			19.17	**		
			(1.40)			
Operations(1)	2.10	*				
	(0.42)					
RiskF(1)	3.36	**	5.26	***	4.66	***
	(0.50)		(0.63)		(0.56)	
Credit(1)			3.64	**	2.60	*
			(0.57)		(0.56)	
C	Lender Application of Credit Risk Management Practices (CRMPs)					
RPAI_CILG			0.05	***		
			(1.15)			
RPAI_LPB			6.19	**		
			(0.88)			
RPAI_RBP			31.15	**		
			(1.45)			
RPAI_DBC			0.01	***		
			(1.47)			
D	Considerations in Credit Processing					
RCC_loanpur			11.74	***		
			(0.88)			

(continued)

	Less than 10% NPL		Between 10 - 20 % NPL		Below 20% NPL	
	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
RCC_CCap					9.47	***
					(0.70)	
RCC_Charct	4.30	**				
	(0.59)					
E	Lender Use of Different Collateral Types					
RAI_BSA	0.30	***	0.21	***	0.13	***
	(0.37)		(0.50)		(0.47)	
RAI_Invent			0.07	***		
			(0.93)			
RAI_Lien			14.70	***		
			(0.89)			
F	Customer Lending Concentrations (LC)					
SSLC			7.57	**	3.65	*
			(0.84)		(0.72)	

As reflected in the data displayed in Table 4 and Figure 4, it can be seen that this study points to at least three main observations with regard to the employees of the three lending giants in Tanzania. The first relates to employees of GIANT_3, where the PLR was generally low and this has been enhanced by having most of its loans alongside the SSLC, which seemed to provide an additional advantage in terms of soft information (Pham & Lensink, 2008). It was found to have a relatively high PLR with regard to the PELC and the PSLC. As a result, the ability of GIANT_3 to generate useful credit information from these sectors was lower, in line with the TPT paradigm (Diamond, 1984; Markowitz, 1959). Thus, both public employees and the private sector are not for GIANT_1 an avenue for the SLC. The lender would be better-off diversifying across sectors if lending on this market.

Like GIANT_3's employees, the ones in GIANT_1 will also be able to achieve a lower PLR if the SSLC dominates and when it is against the PELC. It appears that the SSLC can provide important perceived shock absorbers to address the PLR among employees of this Lender. However, unlike GIANT_3's employees GIANT_1's employees seemed to associate the PSLC with high risk, an observation that was contrary to the previous observation that LC to commercialized sectors, such agriculture, manufacturing, transport and communication,

construction and real estate would have a relatively lower PLR (Le & Diep, 2020; Pham & Lensink, 2008; Skridulytė & Freitakas, 2012). This observation could be linked to the relatively lower ability of GIANT_1 to channel monopoly rents from superior information and monitoring efficiency expertise into the private sector (Simpasa & Pla, 2016).

Figure 4

Lending Giants NPL Risk in Relation to Lending Concentration

(a) GIANT_1's PLR in relation to SSLC

(b) GIANT_1's PLR in relation to PSLC

(c) GIANT_1's PLR in relation to PELC

(a) GIANT_2's PLR in relation to SSLC

(b) GIANT_2's PLR in relation to PSLC

(c) GIANT_2's PLR in relation to PELC
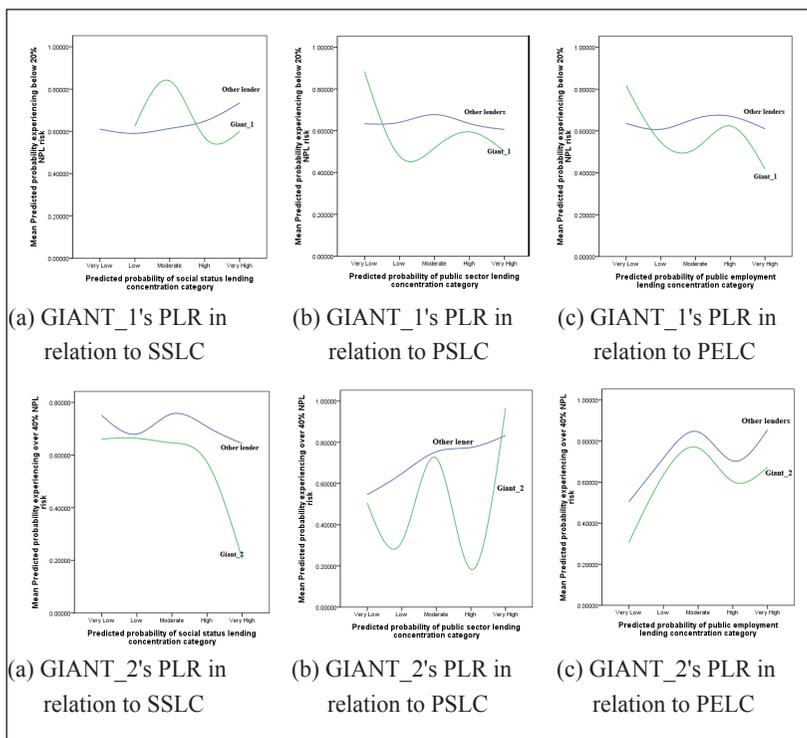
Lastly, there is ample evidence in this study that GIANT_2's employees are unlikely to perceive a high NPL risk regardless of the SLC, an indication that GIANT_2 has proven to be a lower/stable NPL risk avenue. Employees from this lending giant have suggested that a declining PLR in response to the SSLC is an indicator of the strong reliance on social relationship in their operatives, just like the other banks while it is an increasing function of the PELC as an indicator of SLC saturation.

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Figure 5

NPL Risk in Relation to Lending Concentration in Relation to Originality and Size of Lender

(a) PLR across lender's origin in relation to SSLC

(b) PLR across lender's origin in relation to PSLC

(c) PLR across lender's origin in relation to PELC

(d) PLR across lender's size in relation to SSLC

(e) PLR across lender's size in relation to PSLC

(f) PLR across lender's size in relation to PELC
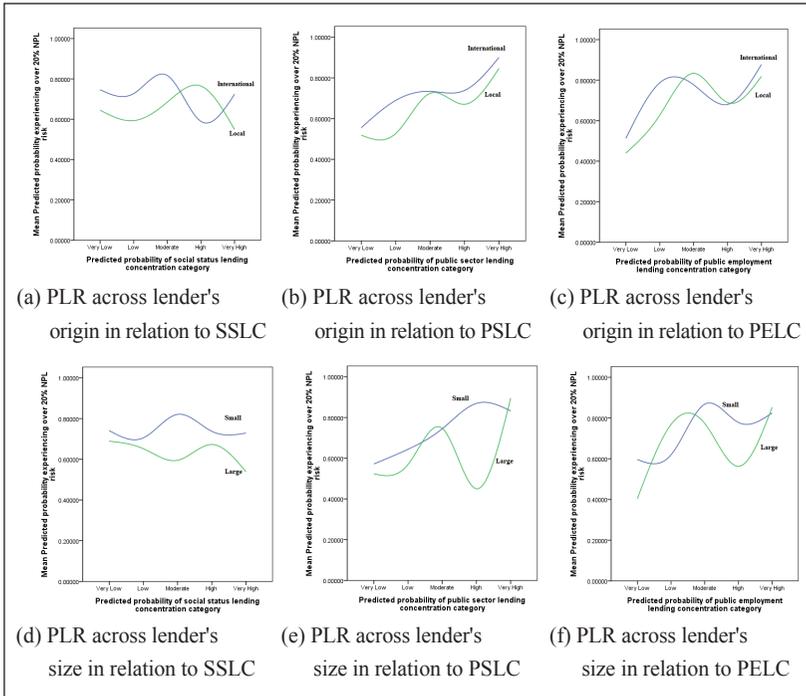
This study further notes a relatively lower PLR in favor of lenders with local origin than those originating elsewhere, suggesting some typological effect in the PLR (Abu Hussain & Al-Ajmi, 2012; Kira, 2013). However, SLC in favor of social status or public employees modifies this effect by suggesting that if local lenders' SLC is in favor of social status or government employees, it will end-up with a relatively high PLR among its employees. It is evident that the effect of origin of bank is stable only when a lender is focused on the private sector. The panels (a) – (d) in Figure 5 provide additional information on the moderating effect of LC on the effect of lender size on the PLR. There is evidence to the effect that local large banks are unlikely to fall prey to the higher PLR among its employees, to reflect a higher ability to grab economies of scale (Beck & de Jonghe, 2013), but high levels of the PLR among international large lenders who may be unable to benefit from the same, if most such economies emanates from social networks.

Effect of the Macroeconomic Environment

This study also examined the Macroeconomic Environment (ME) in relation to the PLR and it became evident that both long lived inflationary and growth experiences were unlikely to increase the probability of a relatively higher PLR. Evaluations of the moderations of LC Panels (a) – (c) of Figure 6 seems to suggest that LC in favor of both the SSLC and the PSLC does not modify the effect of inflation experience. High inflation experience is associated with lower PLR across LC levels only if such LC has been in favor of social status, or private sector firms. This observation suggests that a significant LC based on social status and private sectors may cushion the lender from the negative effect of unprecedented inflationary experience on the NPL. Although the inflationary environment could restraint the household and spending behavior firms (Trautmann & Vlahu, 2013), both the private sector and individuals were relatively more flexible to re-adjust their earnings and expenditure to reflect changes in prices. However, with LC in favor of government employees, the lender is likely to suffer a higher NPL risk, since the earnings of borrowers (employees' salary) are hardly adjustable in the short-run.

This study also analyzed the effect of the GDP growth as experienced by lenders throughout their lending career. The observations suggest that although the high GDP growth experience is generally unlikely to be associated with a high PLR, the higher SLC in favor of social status induces a higher PLR in response to the higher GDP growth. As noted in Le and Diep (2020), the channel of effect could be loan loss provisions and difficulties in managing interest rate risk. Lenders operating during boom are not expected to fall prey to a high PLR, as repayment is guaranteed by the certainty of income flow (Lassoued, 2017). However, if the lender is under the SSLC, see Figure 6 (d), then a reversal of LC effect may be anticipated. This is despite the generalization that LC has a lower PLR, a booming economy might cast a negative shadow on the SSLC, leading to a high PLR.

The Effect of Credit Risk Management

Based on the results displayed in Table 4, three CRMPs appeared in this study to provide intuitive explanations with regard to the PLR. The application of the RBP to mitigate credit risk is unquestionable in as long as LC is in favor of private sector firms, as well as government employees (Wood & Kellman, 2010). However, this study did not

find any significant effect when LC favors social status. For a lender who has not been concentrated in any sector, unlocking the loans of a potential borrower (LBP) would provide an effective mechanism to lower the PLR, as was suggested by Seyram (2013). Thus, the effectiveness of the, LBP as a tool to mitigate credit risk is higher when lenders are against LC in its entirety.

Figure 6

NPL Risk in Relation to Lending Concentration, Originality and Size of Lender

(a) PLR across lender's origin in relation to SSLC

(b) PLR across lender's origin in relation to PSLC

(c) PLR across lender's origin in relation to PELC

(d) PLR across lender's size in relation to SSLC

(e) PLR across lender's size in relation to PSLC

(f) PLR across lender's size in relation to PELC
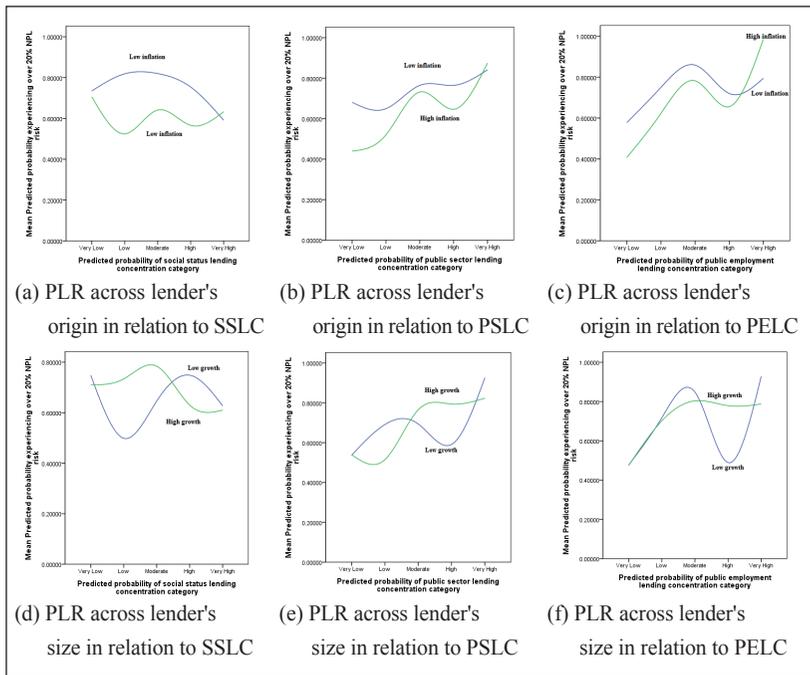
With moderate SSLC and with either very low or very high PSLC, the lender Guarantee to Cover Debt (GCD) works to lower the PLR. A very low LC into the private sector seemed to suggest that more lending was in favor of other criteria, which could entail a strong use of the GCD to avoid the associated PLR, especially from government employees, as well as individuals. When LC is within the private sector, the GCD is also very relevant; this is because concentration may be associated with a high degree of uncertainty and thus, the lender may require a cushion against the NPL risk in the form of the GCD.

The Effect of Considerations in Credit Processing

In terms of considerations in credit processing, the data in Table 4 seem to suggest that assessment of character emerged as the unequivocal consideration, an observation well supported in the literature (Abdulsaleh & Worthington, 2016; Laib, 2013). Regardless of LC, lenders ought to consider borrowers' character, as such a consideration yields relatively lower PLR. These observations are however, contrary to the findings in Pham and Lensink (2008), who observed a limited correlation between character and the PLR. Though the consideration of loan purpose is seen as relevant, this study has noted that such consideration makes sense in reducing the PLR only if the different types of LC are either very low or very high. On the lowest extreme of the SLC, lenders do consider the purpose of the loan as an important criterion in granting loans; this is because borrowers are from diverse sectors for which the lender have limited knowledge (Beck & de Jonghe, 2013; Francisaet al., 2018).

Therefore, detailed information on the purpose of the loan would facilitate the lender in getting some insights on the kind of business and the probability of repayment of the loan from the general behavior of the different purposes of loans (Adzobuet et al., 2017; Böve et al., 2010). At the highest end, the lender is concentrated and faces the risk of putting "all eggs in one basket" alongside the TPT postulates (Le & Diep, 2020). Although the lenders are now more knowledgeable about borrower behavior, they still require information in the appropriate basket – the one which lending should be concentrated. As such, details on the loan purpose will provide a mechanism for the lender to identify the best lending option among the many that exists.

The observations from this study also seem to suggest that the effect of capital consideration is dependent on both the type and level of LC. To achieve lower PLR in response to capital consideration, as suggested in the literature (Richard et al., 2008; Adzobu et al., 2017; Koomson et al., 2016), both the lower and very high SSLC and PSLC can be targeted. The SLC in favor of social status, as well as LC for private firms both would require capital to achieve a lower PLR, because such borrowers would often have capital to declare. At low levels of such SLC, the lender has limited knowledge of the borrower and capital provision to the lender should provide a guarantee to the lender on the ability of individual borrowers, as well as firms to recover the

advanced loan from its assets in case of default. At high SLC, the lender is knowledgeable of the borrower, but capital adequacy is still needed to address moral hazard problems and motivate the borrower to honor its obligation. In terms of SLC to government employees, capital adequacy is unnecessary, as has been suggested by Lassoued (2017), but when availed it can provide mechanisms to address the PLR by ironing out the moral hazards in the borrower's mind (Aghion & Bolton, 1992).

The Effect of Collateral Types

Lastly, this study points to the effect of two collateral types on the PLR. The first is the use of the Business Savings Account (BSA), which was seen as inducing a high PLR perception, contrary to expectations (Koomson et al., 2016). However, a high PSLC reverses such an effect. The use of the BSA can be a useful tool to mitigate the PLR only if the lender LC is in favor of the private sector. In this market, business accounts are more prevalent and having one induces a comfort zone to lenders. Similarly, inventories as collateral can reduce the PLR when LC is either very low or when it is very high for all LC typologies. In either case inventories operate in the same manner as capital (Richard et al., 2008; Adzobu et al., 2017): at the lowest level of the SLC, inventories address the information gap (Chan & Thakor, 1987; Stiglitz & Weiss, 1981), while at the highest the SLC provide a cushion against moral hazard behavior among lenders (Aghion & Bolton, 1992).

CONCLUSION

The findings of this study, based on the contradictory observations in Tanzania that intensive credit crunch via the CRMPs seemed to provide a marginal outcome in terms of lowering the NPL risk, could be explained by the fact that there had been lending over-concentration based on social status across large and small lenders. Furthermore, it is evident that lending concentration reverses the effect of the macroeconomic variables, credit risk management practices (CRMPs), Credit Processing Considerations (CPCs), as well as collateral types. It is evident that only the intensification of "character", "capital" and "inventory" scrutiny during loan processing has had a direct NPL risk-reducing effect, while all other

considerations or CRMPs were dependent on the degree of lending concentration. Therefore, assessing the degree of lender LC across customers or sectors is imperative prior to any credit risk management initiative. Furthermore, it is notable that although LC has directly affected the PLR, as predicted by the traditional and corporate finance theories, the indirect LC effect via CRMPs, CPCs, bank size and originality, as well as the various collateral typologies has provided some new insights into this area of research.

In terms of policy implications, it would be advisable that the Central Bank (BOT), instead of requiring lenders to have in place a holistic credit management program, should demand for the adoption of flexible lending policies to reflect the macroeconomic environment, as well as the respective magnitude and direction of LC. Restrictions should be placed on lenders with a SSLC, i.e., lending based on the characteristics of borrowers to the effect that they refrain from excessively expanding loans during high economic growth, and unless they re-direct such loans in favor of other criteria, especially employment and productivity of enterprises.

Such restrictions may also extend to specific CRMPs. For example, the findings of this study have suggested that the RBP is an effective strategy to militate against the NPL risk, only if the lending favors the PSLC or the PELC, while the LBP is effective for lenders who are balanced in their lending behavior. Similarly, loan guarantees are effective only when the SSLC and the PSLC are low, while a business savings account scrutiny during loan processing works to reduce the PLR under high PSLC. A policy to restrict or control the use of the RBP should be advocated only in an environment where the lending concentration is not well guided. It should apply only to lenders whose lending is biased in favor of the SSLC, or the use of the LBP by lenders who are heavily concentrated, or the use of a loan guarantee to a lender who faces the PELC.

ACKNOWLEDGMENT

ENDNOTES

[1]   For the updated list of financial institutions in Tanzania visit https://www.bot.go.tz/BankSupervision/Institutions

[2]   Such legislations include Business Registration and Licensing Agency; the National Payment Systems Act, 2015, Cooperative Societies Act, 2013; Companies Act 2002; Societies Act Cap 337 of 1954; NGO Act 2002; Trustees' Incorporation Act 2002 (Cap 318).

[3]   This data was however, not the subject of the current study.

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APPENDICES

Appendix 1: Description of the Variables

S/N	Variables Name	Abbrev.	Description and Measurement
A	Perceived Non-performing loans risk	PLR	A dummy constructed from the probability of experiencing each of the NPL rates/ range and converted into dummies for each range of NPL rate i.e. below 10%, 10 -20%, 20 – 40% and above 40%
B	Lender's/Respondents' Characteristics		
B0	Lender size is large	Sizelarge	A dummy for large lender taking a value of 1 if TRUE and 0 Otherwise
B1	Lender is local and large	Local_large	A dummy for large local lender taking a value of 1 if TRUE and 0 Otherwise
B2	Lender's origin is local	OrgLocal	A dummy for local lender taking a value of 1 if TRUE and 0 Otherwise
B3	Works at GIANT_2 bank	GIANT_2	A dummy for GIANT_2 Bank taking a value of 1 if TRUE and 0 Otherwise
B4	Works at GIANT_3 bank	GIANT_3	A dummy for GIANT_3 Bank taking a value of 1 if TRUE and 0 Otherwise
B5	Works at GIANT_1 bank	GIANT_1	A dummy for GIANT_1 Bank taking a value of 1 if TRUE and 0 Otherwise
B6	Works at other International lender	OIB	A dummy for an International lender other than major Banks taking a value of 1 if TRUE and 0 Otherwise
B7	Works at other local bank	OLB	A dummy for an local lender other than major Banks taking a value of 1 if TRUE and 0 Otherwise
B8	Work at back office operation	Back	A dummy for work in back-office operations taking a value of 1 if TRUE and 0 Otherwise
B9	Work as a manager	Manage	A dummy for work as manager taking a value of 1 if TRUE and 0 Otherwise
B10	Works in the credit department	Credit	A dummy for employed in the credit department taking a value of 1 if TRUE and 0 Otherwise
B11	Works in the general administration department	Administration	A dummy for employed in the general administration department taking a value of 1 if TRUE and 0 Otherwise
B12	Risk and/ or finance departments	RiskF	A dummy for employed in the Finance and/or risk department taking a value of 1 if TRUE and 0 Otherwise
B13	Work in the operations department	Operations	A dummy for work as supervisor taking a value of 1 if TRUE and 0 Otherwise

(continued)

S/N	Variables Name	Abbrev.	Description and Measurement
B14	Work Experience	Exper	Experience in lending business in years
C	Macroeconomic Environment (ME)		
C1	Experienced growth	Grow_Exper	Average growth rate over the lending experience years based on GDP growth from WDI
C2	Experienced inflation	Infl_Exper	Average inflation rate over the lending experience years based on CPI from WDI
D	Lenders application of Credit Risk Management Practices (CRMPs)		
D1	Credit insurance to loans granted	CILG	An index of the level at which lenders apply credit insurance to loan granted as specified borrowers as computed based on eq. 1
D2	Apply apply different bank covenants to loans granted	DCB	An index of the level at which lenders apply apply different bank covenants to loans granted as computed based on eq. 1
D3	Apply bank guarantee to loans granted	GCD	An index of the level at which lenders apply guarantee to loans granted as computed based on eq. 1
D4	apply credit review before granting loans	Crev	An index of the level at which lenders apply credit review before granting loans as computed based on eq. 1
D5	unlock loans of potential borrowers	LPB	An index of the level at which lenders unlock loans of potential borrowers as computed based on eq. 1
D6	Apply premium lending to specified borrowers	PBB	An index of the level at which lenders apply premium lending to specified borrowers as computed based on eq. 1
D7	apply risk based pricing to loans granted	RBP	An index of the level at which lenders apply risk based pricing to loans granted as computed based on eq. 1
E	Considerations in credit processing		
E1	Age	Age	An index of the level at which lenders consider age of the borrower when processing loans applications as computed based on eq. 1
E2	Business experience	BusExp	An index of the level at which lenders consider business experience of the borrower when processing loans applications as computed based on eq. 1

(continued)

S/N	Variables Name	Abbrev.	Description and Measurement
E3	Current capital	CCap	An index of the level at which lenders consider current capita of the borrower when processing loans applications as computed based on eq. 1
E4	Existing debt	CDebt	An index of the level at which lenders consider current debt of the borrower when processing loans applications as computed based on eq. 1
E5	Current number of dependants	Cdep	An index of the level at which lenders consider current dependants of the borrower when processing loans applications as computed based on eq. 1
E6	Character	Charct	An index of the level at which lenders consider character of the borrower when processing loans applications as computed based on eq. 1
E7	Collateral	Collat	An index of the level at which lenders consider collateral of the borrower when processing loans applications as computed based on eq. 1
E8	Employment	Employ	An index of the level at which lenders consider employment of the borrower when processing loans applications as computed based on eq. 1
E9	Income	Income	An index of the level at which lenders consider income of the borrower when processing loans applications as computed based on eq. 1
E10	Loan purpose	Loanpur	An index of the level at which lenders consider borrower's loan purchase when processing loans applications as computed based on eq. 1
	Credit History	CredH	An index of the level at which lenders consider borrower's credit history when processing loans applications as computed based on eq. 1
F	Lender's use of different collateral types		
F1	Land Plot	Land	An index of the level at which lenders use land plots as collateral as computed based on eq. 1

(continued)

S/N	Variables Name	Abbrev.	Description and Measurement
F2	Partially completed property	PCP	An index of the level at which lenders use incomplete property as collateral as computed based on eq. 1
F3	Completed property	CP	An index of the level at which lenders use completed property as collateral as computed based on eq. 1
F4	Business Saving Account	BSA	An index of the level at which lenders use borrower saving account as collateral as computed based on eq. 1
F5	Inventory	Invent	An index of the level at which lenders use inventory as collateral as computed based on eq. 1
F6	Lien	Lien	An index of the level at which lenders use land plots as collateral as computed based on eq. 1
F7	Invoice	Invoice	An index of the level at which lenders use invoice as collateral as computed based on eq. 1
G	Customer Lending Concentrations (LC)		
G1	Social Status Lending Concentration	SSLC	Probability of lending to individuals from the household sector as computed based on eq. 2
G2	Private Sector Lending Concentration	PSLC	Probability of lending to incorporated private sector borrowers as computed based on eq. 2
G4	Public Employee Lending Concentration	PELC	Probability of lending to government employee borrowers as computed based on eq. 2

Appendix 2: Number of respondents from different lender institutions

	Bank origin and size				Total
	Local & large	Local & small	International & large	International & small	
Bank Financial Institutions (Lenders)					
CRDB Bank Plc	23	0	0	0	**23**
NMB Bank Plc	20	0	0	0	**20**
National Bank of Commerce Ltd	7	0	0	0	**7**
TIB Development Bank	2	0	0	0	**2**
Tanzania Agricultural Development Bank	2	0	0	0	**2**
Bank of Tanzania (BOT)	1	0	0	0	**1**
TPB Bank Plc	0	6	0	0	**6**
Azania Bank ltd	0	2	0	0	**2**
Maendeleo Bank Plc	0	2	0	0	**2**
BPZ Bank	0	1	0	0	**1**
CANARA Bank Tanzania Ltd	0	1	0	0	**1**
DCB	0	1	0	0	**1**
I & M bank	0	1	0	0	**1**
Mwalimu Commercial Bank	0	1	0	0	**1**
Absa Bank Tanzania	0	0	8	0	**8**
Standard Chartered Bank Ltd	0	0	4	0	**4**
Stanbic Bank Tanzania Ltd	0	0	2	0	**2**
Banc ABC Bank	0	0	1	0	**1**
Citibank	0	0	1	0	**1**

(continued)

	Bank origin and size				Total
	Local & large	Local & small	International & large	International & small	
Equity Bank Tanzania Ltd	0	0	0	9	**9**
Access Bank Tanzania Ltd	0	0	0	7	**7**
Bank of Africa (Tanzania) Ltd	0	0	0	5	**5**
Exim Bank Tanzania Ltd	0	0	0	5	**5**
United Bank for Africa (Tanzania) Ltd	0	0	0	4	**4**
DTB	0	0	0	3	**3**
NCBA Bank Tanzania Limited	0	0	0	3	**3**
China Bank	0	0	0	1	**1**
Ecobank Tanzania	0	0	0	1	**1**
FBL	0	0	0	1	**1**
FNB	0	0	0	1	**1**
Guaranty Trust Bank Tanzania	0	0	0	1	**1**
ICB	0	0	0	1	**1**
FINCA Microfinance Bank	0	0	0	2	**2**
Non-Bank Financial Institutions (Lenders)					
Vision Fund Tanzania	0	0	0	1	**1**
BANKABLE - Financial Services Intermediary	0	1	0	0	**1**
Ambroce France Shirima	0	1	0	0	**1**
Bumaco Insurance	0	1	0	0	**1**
Not mentioned	0	0	0	17	**17**
	54	**19**	**17**	**61**	**151**