Financial access and productivity of manufacturing firms in the Philippines

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JOMEINO
ISSN:
2522-381X (Print)
2521-7054 (Online)
DOI: 10.31039/jomeino

Received 04 July 2022
Revised 10 August 2022
Accepted 03 September 2022

Citation: Catacutan, Z. M. (2022). Financial access and productivity of manufacturing firms in the Philippines. *Journal of Management, Economics, and Industrial Organization,* 6(3), 47-61.
http://doi.org/10.31039/jomeino.2022.6.3.4

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Abstract

Many scholars examined and immensely found significant causal relationship present between access to finance and firms' productivity. However, limited studies and inconclusive generalizations are still pervasive regarding co-existing nexus between financial access in form of overdraft facilities offered by financial institutions toward productivity of manufacturing firms in the Philippines. In addition, cross-country differences related to business environment, income levels, size and depth of the financial system, financial frictions and legal constraints potentially exposing model estimations to simultaneity issues. Thus, this study extends the empirical examination of finance-led productivity growth assumptions and expands the application of econometric modelling through instrumental variable regression models using an enterprise survey conducted in 2015 by the World Bank among selected manufacturing firms in the Philippines. The main findings revealed the positive and significant impact of financial access through acquisition of overdraft facilities in enhancing manufacturing firms' productivity proxied by real annual sales. Meanwhile, other firm-related factors such as R&D and capital intensities were also found to have significant influence on productivity of manufacturing firms. These results signal practical implications highlighting managers consideration in the inclusion of overdraft facilities as an alternative source of funding for their financing strategies alongside proper resource allocation and management of technology and capital structure, which will provide an avenue for firms to achieve the desired level of productivity growth. However, lack of empirical evidence was found regarding the significant contribution of financial access on productivity when proxied by measures of TFP.

Keywords: Financial access, firm-level productivity, financial services and institutions, switching regression, manufacturing.

JEL Classification Codes: C3, D24, G21, L6, G29.

1. Introduction

Many scholars explained the positive influence of access to finance on productivity. Levine and Warusawitharana (2014) highlighted that sustainability in the productivity levels as a result of augmentation of external financing which were transcended on innovative projects robustly increased productivity growth. In addition, access to credit or external finance like overdraft facilities were found to have positive and significant contribution towards the enhancement of firm-level productivity (Bokpin, Ackah, & Kunawotor, 2018; Giang, Trung, Yoshida, Xuan, & Que, 2019; Khalily & Khaleque, 2013; Han & Shen, 2015). Meanwhile, other empirical results supplemented that lack of access to overdraft facilities and increased financing constraints will most likely decrease and hampered firm level productivity growth even across different classification and sizes of the firms (Bui, Pham, Pham, & Ta, 2021; Onubedo & Yusuf, 2018).

Despite of these notable findings in the literature, mixed findings and inconclusive generalizations were still vastly observed with regards to the underlying effects of wider access to external finance on manufacturing firms' productivity. These issues can be attributed on some factors that affect the external and internal business environment such as cross-country differences in terms of income levels, depth and size of the financial system, legal and financial constraints, and even geographical landscapes (Ezzahid & Elouaourti, 2018). While, firms access to banking system and capital markets varies across industries and firms, some statistical estimations and analyses were highly exposed to simultaneity issues resulting to ambiguity of key findings related to finance-led growth models. Furthermore, the underlying dynamics in productivity growth estimations for firms revealed the varying effects of financial access which also have repercussions in policy formations (Asongu, 2019).

Thus, it is imperative to conduct further studies that will examine the underpinnings and effects of financial access on firms' productivity growth since there is still a paucity of empirical studies conducted on the manufacturing industry in the Philippines. This paper aims to fill this gap by examining the impact of access to overdraft facilities offered by financial institutions as a proxy of access to external financing and some firm-specific factors on firm-level productivity. The contributions of this paper will focus on the empirical analysis of the effects of access to overdraft facilities while taking into account the various measures of firm productivity and addressing endogeneity and bias estimations in the model estimations using two-stage least squares (2SLS) regression.

Furthermore, manufacturing firms will be able to get strategic perspectives on the leverage of greater access to external funding by considering inclusion of overdraft facilities offered by financial institutions in their financing strategies reflected in their respective cash flows, as this

can be a vital piece for sustainable long-term productivity. Likewise, the study's findings are also intended to provide vital information to policymakers in order to aid in the development of related policies and regulations that will boost liquidity in the manufacturing sector through greater access to the banking and financial sectors.

2. Literature Review

2.1. Historical developments on productivity growth in the Philippines

Few studies have been conducted in the Philippines in terms of productivity growth across different sectors and industries. Commonly, total factor productivity (TFP) serves as the key indicator of productivity growth. Moreover, the slumping levels of aggregate output, protectionism-related policies, and idiosyncratic macroeconomic conditions resulted to deflating growth of around 0.4% from 1960 to 1996 which also pushes inflationary pressure in the economy (Austria, 1998). As a matter of fact, drastic decline in the levels of TFP growth were seen in the manufacturing sector due to unsustainable productivity and deterioration of technological progress (Cororaton & Caparas, 1999; Cororaton, Endriga, Ornedo, & Chua, 1995). Furthermore, Cororaton and Cuenca (2001) came to a similar conclusion, demonstrating that political instability, natural catastrophes, energy crises, and even the exceptional Asian financial crisis in 1997 all hindered productivity growth. During the 1980s and early 1990s, the manufacturing industry suffered considerably as reflected by a steep fall in TFP growth (Cororaton et al., 1995; Cororaton & Caparas, 1999). In spite of the slowing productivity growth, the manufacturing sector has remained resilient and has overcome the negative productivity situation.

Meanwhile, the Philippines has drawn international investment in electrical items while building competitiveness in the textile industry. According to Glindro and Amodia (2015) and Llanto (2012), increasing the country's productivity growth demands investments in education, long-term government support and funding for human capital and workforce development, more openness to foreign direct investments, infrastructure development, job creation, innovation and technology enhancement, value and supply chain development, and formidable macroeconomic policies and regulations that will curve negative shocks posed by the volatility of financial and economic indicators both in domestic and international markets. Currently, intra-industry productivity is driving the Philippines' aggregate productivity improvement. This involves reallocating resources to more productive tasks, which results in higher firm-level production.

However, inequalities in the production levels were predominantly seen on small firms compared to medium and large firm categories. The disparities on resource allocation hindered manufacturing firms to invest, innovate, and upscale business operations which on the other hand, hampered firms' productivity. These issues were associated to inadequate access to credit, low

technology adoption and utilization, resource scarcity, knowledge and skill gaps, preferential taxation and access to capital markets, economic shocks, and declining export capacity. Finally, tough competition and emerging technologies in the international markets reduced export participation of these firms as most of the ventured on local operations rather than continuing global operations (World Bank, 2018). Still, silver lining arises as the country at present managed to record an average productivity measured by TFP growth by approximately 1.5 percent. Kim and Loayza (2019) highlighted those prudent investments in innovation and technology, education, infrastructure, and modernizing institutions will sustain the levels of TFP growth at 1.6 percent per annum which will led to sustainable economic growth and firm-level productivity.

2.2. Access to credit and firm-level productivity

A plethora of studies has highlighted the major role of increased credit availability in the long-term sustainability of firm-level TFP growth. Bokpin et al. (2018) found that access to overdraft facilities had incrementally upgraded firms' productivity while controlling for firm-related factors such as firm size, age, location, export orientation, foreign ownership, and international quality certification using panel data derived from the World Bank's Enterprise Survey. Furthermore, Gatti and Love (2006) stressed the essential incremental effect and significant relationship between increasing financial access and firm-level productivity. Having efficient and expanded loan availability enables firms to retain a competitive market position, which has a mutually positive influence on productivity growth (Aghion, Bergeaud, Cette, Lecat, & Maghin, 2019; Gatti & Love, 2006).

Moreover, Lopez (2017) findings highlighted that improving access to credit contributed in the improvement of private credit to GDP ratio in Mexico while gaining TFP growth as a result of better resource allocation. Likewise, Calub (2011) underscored that increasing firms access to capital flows from financial institutions may attract entrepreneurship which positively influenced firms' productivity. Arnold and Flach (2017) on the other hand, supplemented this finding wherein they verified that through improvement in credit accessibility resulted to higher aggregate productivity especially for more productive firms since additional resources were added to their operating capital. Likewise, Giang, et al. (2019) findings from small and medium enterprises in Vietnam using propensity score matching coupled with difference-in-difference approach found that a percentage increase on SMEs access to overdraft facility significantly improved average firm-level TFP by 12.3% and 15.7%, respectively.

In addition, unrestrained credit markets and wider access to loan programs offered by development banks increased investment rate which found to have positive and significant effects on small and medium category firms' productivity (Cavalcanti & Vaz, 2017). Through financial inclusion

achieved by access to overdraft facilities from banks and its positive interaction to financial deepening, firms managed to achieve positive productivity growth (Chauvet & Jacolin, 2015). Meanwhile, affordable and wider access to credit provides firms with additional resources to finance innovative activities that improve production capacity and company growth, resulting in higher levels of aggregate firm productivity (Dabla-Norris, Kersting, & Verdier, 2010; Impullitti, 2022).

Furthermore, other empirical studies bolstered the finance-productivity link at the firm level. As financial development expands, capital accumulation of firms also intensifies resulting in higher levels of productivity growth. (Arizala, Cavallo, & Galindo, 2013; Benhabib & Spiegel, 2000; Guillaumont-Jeanneney, Hua, & Liang, 2006). Moreover, Gatti and Love (2006) underlined the strong positive and significant association between access to credit and firms' productivity. While boosting firm competitiveness through firm participation in financial markets and developing access to financial markets and bank loans, firms' liquidity was extended and business opportunities and optimal investment decisions were created, which improved firms' financial health while harnessing productivity and performance (Fowowe, 2017; Thangavelu & Chongvilaivan, 2013). Lastly, through debt markets, firms also managed to increase their access to external financing which was found to be valuable for sustainable productivity growth as observed both in advanced and emerging economies (Gomis & Khatiwada, 2017; Levine & Warusawitharana, 2014).

However, it is apparent from other related studies the disparities of the impact of financial access towards firm-level TFP growth. Empirical results revealed that slow development in the financial sector negates TFP growth especially for low-income and upper middle-income countries (Ezzahid & Elouaourti, 2018). Limited access to external finance like overdraft facility dampened TFP performance of firms. This can be highly observed in the case of small-category firms (Onubedo & Yusuf, 2018). Uprising financing obstacles and constraints both hampered employment growth and firm productivity found across micro and small firms in South Asia (Bui, et al., 2021). Restricted access to source of external finance lessens firms' availability of funds which can be utilized on venture projects resulting to TFP contraction. Giang, et al. (2019) pointed out that healthy and accessible external financing stimulates firm productivity in the case of a Southeast Asian country like Vietnam. Therefore, it is of high relevance to expand and conduct further studies regarding the effects of access to external finance while taking into account the firm-related factors to broaden explanations regarding its impact on firms' productivity.

3. Data and Methodology

This study used comprehensive firm-level data sourced from the recent World Bank Enterprise Survey conducted among selected firms in the Philippine manufacturing industry. The survey data was represented by approximately a sample size of 731 participating firms selected from the manufacturing industry and were randomly selected across various regions in the country through a series of face-to-face interviews. The data utilized in the econometric analysis was composed of a combination of firm-specific indicators such as financial access proxied by overdraft facilities offered by financial institutions and other firm-related factors such as intensities of R&D, capital expenditures, human capital, and sales generated from direct exports. Meanwhile, the measures of firm-level productivity were measured in two ways. First, productivity as measured by TFP growth was anchored on Cobb-Douglas production function and estimation procedure proposed by Şeker and Saliola (2018). Finally, productivity was proxied by real annual sales generated by manufacturing firms wherein the indicator description was followed in accordance with the variable classification indicated in the World Enterprise Survey spearheaded by the World Bank based on the Philippine manufacturing sector in 2015.

Table 1. Definition of variables used for firm productivity derived from Cobb-Douglas estimates

Symbol	Variable Name	Variable Description	Source of Data
Y_i	Firms' total annual output	Represents the firm's annual real sales and value-added output	World Bank Enterprise Surveys
K_i	Cost of capital	Refers to the annual capital expenditures measured based on the net book value accounted to costs related to machineries, equipment, and vehicles	World Bank Enterprise Surveys
L_i	Cost of labour	Refers to the sum of labour costs depicted from wages, salaries, bonuses, and social security payments incurred per annum	World Bank Enterprise Surveys
M_i	Cost of raw materials	Refers to the total costs incurred for raw materials and intermediate goods in an annual basis	World Bank Enterprise Surveys
A_i	TFP term	Indicates the TFP term	World Bank Enterprise Surveys

Note: All of the given variables were transformed in their logarithmic form.
Data Source: The data used in the estimation procedure were gathered from The World Bank official database and website for enterprise surveys (http://www.enterprisesurveys.org).

In detail, to calculate on the productivity of selected manufacturing firms, the Cobb-Douglas production estimation procedure following Şeker and Saliola (2018) from the World Bank was implemented in the analysis. The proxies of productivity are transformed in their logarithmic form.

These include TFP growth as to YAKL (log of TFP from residual component of the production function with predictors consisting of log of annual labour costs and log of cost of capital), TFP growth as to YAKLM (log of TFP from residual component of the production function with the addition of log of raw materials and intermediate goods costs), TFP growth as to YAKLEM (log of TFP from residual component of the production function supplemented by log of energy and electricity costs), and TFP growth as to VAKL (log of TFP from residual component of the production function derived from the difference of annual sales and cost of energy and electricity). The detailed definition of all given variables used in the estimation procedure and analysis were stated in Table 1.

Furthermore, the endogenous variable, on the other hand, includes financial access represented by access to overdraft facilities from financial institutions. The just-identified model specification was followed since the size of the firm only serves as the main instrument. In addition, the exogenous variables composed of intensities of R&D, capital expenditures, human capital, and export performance which indicators' description were discussed in detail under Table 2.

Table 2. Definition of variables used in instrumental variable regression (IV) modelling

Symbol	Variable Name	Variable Description	Source of Data
$lnProd_i$	Firm-level productivity	This indicator is represented by proxies of TFP which were calculated following Seker and Saliola (2018) and real annual sales generated by firms all of which are transformed to their respective logarithmic form;	World Bank Enterprise Surveys
$FinAccess_i$	Financial access	This indicator is a binary data measured by access to overdraft facilities offered by financial institutions (0=No, 1=Yes)	World Bank Enterprise Surveys
$R\&Dintensity_i$	R&D intensity	This indicator represents the ratio of research and development expenditures over real annual sales	World Bank Enterprise Surveys
$Capitalintensity_i$	Capital intensity	This indicator represents the ratio of net book value of assets over sales that are invested in machineries, equipment, and vehicles integrated and utilized in manufacturing operations	World Bank Enterprise Surveys
$Exportintensity_i$	Export intensity	This indicator shows the exact percentage of the firm's annual sales over direct exports	World Bank Enterprise Surveys
$Humancapitalintensity_i$	Human capital intensity	This indicator is measured by the exact percentage of full-time permanent workers who completed secondary school	World Bank Enterprise Surveys

Data Source: The data used in the estimation procedure were gathered from The World Bank official database and website for enterprise surveys (http://www.enterprisesurveys.org).

The econometric model equation incorporating instrumental variable regression (IV) is shown as follows:

$$lnProd_i = \alpha_i FinAccess_i + \beta_0 + \beta_1 R\&Dintensity_i + \beta_2 Capitalintensity_i + \beta_3 HumanCapital\ intensity_i + \beta_4 Exportintensity_i + u_i \quad (1)$$

In Equation 1, $lnProd_i$ represents the outcome variable measured in terms of firm productivity. This indicator is proxied by measures of TFP growth or real annual sales generated by firms were transformed in natural log form. Moreover, firm-related factors which are presented in ratios denominated over real annual sales and direct exports, and percentages based on the level of educations composed of indicators related to R&D, capital investment, human capital aspect, and export performance served as the independent/exogenous variables in the analysis. In Equation 2, these exogenous variables (x's) were examined along with the endogenous variable, $FinAccess_i$, to make sure that issues of multicollinearity don't exists in the model. In addition, firm's size served as the instrument (z_i) included in the equation. Lastly, the endogenous variable will be regressed to exogenous variables which are uncorrelated with the instrument and error terms in order to test independence of observations. The robust standard errors were utilized in the model equation for model robustness. The second equation was presented as follows:

$$FinAccess_i = \sigma_0 + \sigma_1 x_1 + \sigma_2 x_2 + \ldots + \sigma_k x_k + \sigma_{k+1} z_i + \ldots + \sigma_{k+1} z_i + \varepsilon_i \quad (2)$$

4. Results and Discussion

The preliminary investigation focused on firm-level productivity was anchored on Seker and Saliola (2018) TFP model estimation. The logarithmic forms of firm productivity as to measures of TFP (YAKL, YAKLM, YAKLEM, VAKL) and real annual sales generated by selected manufacturing are shown in Table 3. According to the empirical evidence, there are differences in average levels of productivity across selected manufacturing firms. While the empirical results were found to be consisted with manufacturing firms' productivity in Southeast Asia (Seker & Saliola, 2018).

Table 3. Descriptive results on the average manufacturing firms' productivity

Productivity Indicators	Mean	Std. Dev.
TFP (YAKL)	0.775	0.445
TFP (YAKLM)	0.669	0.281
TFP (YAKLEM)	0.703	0.266
TFP (VAKL)	0.445	0.428
Sales Productivity	7.720	0.925

Note: Based on author's calculation and analysis. All of the given measures of productivity were calculated using Seker and Saliola (2018) modified Cobb-Douglas equation. TFP refers to total factor productivity.
Data Source: The data used in the estimation procedure were gathered from The World Bank official database and website for enterprise surveys (http://www.enterprisesurveys.org).

The descriptive results in Table 4, on the other hand, revealed that the majority of manufacturing firms (89.46 percent) did not rely totally in the subscription and usage of overdraft facilities provided by financial institutions, while the remaining 10.54 percent maximized this type of external financing as an alternative source of external funds used for their financing endeavors. These findings validated the lack of reliance on external financing in the form of overdraft facilities by most of the manufacturing firms.

Table 4. Number of manufacturing firms that utilized overdraft facilities from financial institutions

	Actual Response	Frequency	Percentage
Did the establishment apply for for any lines of credit or loans	No	297	89.46
	Yes	35	10.54
	Total	332	100

Note: Based on author's calculation and analysis; Number of observations = 332.
Data Source: The data used in the estimation procedure were gathered from The World Bank official database and website for enterprise surveys (http://www.enterprisesurveys.org).

Furthermore, empirical evidence shown in Table 5 demonstrated that the influence of financial access through overdraft facilities on firm-level productivity using TFP proxies was statistically non-significant. These findings were reinforced by Ezzahid and Elouaourti (2018), who discovered that increasing financial access through the development of financial sector was inconsequential in upper middle-income countries. Meanwhile, it can be seen that the majority of firms chose not to avail themselves of the overdraft facilities offered by financial institutions. These findings can be linked to financial frictions that deter firms from seeking external financing, such as higher transaction fees, banks' prejudices and bias on large firms, collateral requirements, information asymmetries, and capital reallocation, all of which have a greater impact on future productivity growth (Chen & Song, 2013; Ezzahid & Elouaourti, 2018).

Access to overdraft facilities, on the other hand, was found to have a substantial positive influence on firm-level productivity (only on proxy of real annual sales), as illustrated in Table 5. This finding explains that increasing the proportion of external funding sourced from overdraft facilities offered by financial institutions will result in 6.94 times improvements in productivity growth. As a result, enhancing firms' access to overdraft facilities will lead to more efficient and optimum productivity growth. In line with Giang et al., (2019), this empirical finding supports empirical evidence that stresses larger and unrestricted access to external finance by manufacturing firms as favourable and advantageous in boosting firm-level productivity. Meanwhile, Table 5 shows that other firm-related factors were found to be consistently statistically significant and have huge

impact on firm-level productivity. R&D intensity was found to have negative effects in all proxies of productivity (except for real annual sales). These contrasting results can be attributed on less R&D investments placed by manufacturing firms especially those firms that experienced constraints in access to external financing which in return resulted to a low conversion in annual sales output (Jin, Zhao, & Kumbhakar, 2018). Still, manufacturing firms must be able to invest in R&D since innovative activities associated with it may also affect productivity growth in the long-run (Kim & Park, 2018; Satpathy, Chatterjee, & Mahakud, 2017).

Table 5. Instrumental variables (IV) regression results

	TFP as to YAKL (1)	TFP as to YAKLM (2)	TFP as to YAKLEM (3)	TFP as to VAKL (4)	Sales Productivity (5)
Overdraft facilities	-0.09	0.21	0.00	-0.01	6.94***
	(0.36)	(0.27)	(0.24)	(0.36)	(2.21)
R&D intensity	-0.29***	-0.21***	-0.22***	-0.30***	0.45
	(0.04)	(0.03)	(0.02)	(0.03)	(0.38)
Capital intensity	-0.09***	-0.04***	-0.02***	-0.08***	-0.20***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.06)
Human capital intensity	0.31***	0.07	0.04	0.19*	0.65
	(0.08)	(0.07)	(0.06)	(0.01)	(0.53)
Export intensity	0.02	0.06	0.05	0.03	0.29
	(0.07)	(0.05)	(0.05)	(0.06)	(0.34)
Cons	0.58***	0.61***	0.68***	0.40***	6.52***
	(0.09)	(0.04)	(0.06)	(0.10)	(0.48)
F-statistic	15.64***	14.77***	26.18***	21.94***	6.59***
R-squared	0.81	0.85	0.88	0.58	0.92
Root MSE	[0.398]	[0.281]	[0.260]	[0.399]	[2.165]

Note: Based on author's calculation and analysis; Number of observations: 332; The numerical values in parentheses are robust standard errors (below indicator's coefficients) The Root MSE values are shown in squared brackets. P-values significance level are presented in asterisks with *** p<0.01, ** p<0.05, * p<0.1.

Table 5 likewise shows that capital intensity also found to have statistically significant and negative effect on firm-level productivity. An increase in the ratio of capital expenditures over sales will most likely decrease the levels of firm productivity. This finding contradicts with previous studies emphasizing on the positive influence of this indicator in productivity (Yasar & Paul, 2007, and Segarra & Teruel, 2011). This can be attributed on the low investment of firms toward machineries and other equipment which necessitates additional capital allocation which on the other hand, resulted to lower productivity gains. Moreover, human capital intensity found to have positive impact on productivity (only for TFP growth). This result conforms with previous studies that underscored increased percentage on employees with higher educational qualification will translate to higher levels of productivity (Botrić, Božić, & Broz, 2017; Liu & Bi, 2019).

However, the empirical results in this study, found lack of evidence to support the significant contribution of export performance in improving levels of firm productivity. This can be a manifestation of low percentage of annual sales and revenues generated by firms over direct exports. This also attest the findings of the World Bank (2018), which emphasized on firms' decreasing export capacity due to high levels of competition in the international markets. As a result, these firms decided just to penetrate the domestic market wherein competition can be manageable and profitable at their end (Table 5).

Furthermore, the results of the diagnostic tests used to validate the model are shown in Table 6. The results show that the assumptions for model fitting for the two-stage least squares model of financial access and proxies of firm-level TFP were achieved, as evidenced by the given statistic values. The diagnostic findings showed that the models were resistant to model misspecifications such as under-identification and weak identification. Specifically, Kleibergen-Paap rk LM statistic values indicated high level of statistical significance stating the robustness of all models to under-identification. On the other hand, Kleibergen-Paap rk F statistic signifies robustness of the models with weak identification as the values are greater than 10. The overdraft facilities indicator was also found to be identically suitable as the endogenous regressor as revealed and proven by a high degree of statistical significance and high value in the Chi-square statistic. Lastly, the heteroskedasticity test revealed homoscedastic or consistent variation across levels of productivity in all model specifications (Table 6).

Table 6. Model diagnostic test results

	TFP as to YAKL (1)	TFP as to YAKLM (2)	TFP as to YAKLEM (3)	TFP as to VAKL (4)	Sales Productivity (5)
LM statistic	10.147***	10.147***	10.147***	10.147***	10.147***
Wald/F statistic	10.574	10.574	10.574	10.574	10.574
Chi-square statistic	0.007	0.847	0.004	0.002	53.293***
Heteroskedasticity test statistic	3.735	1.270	0.534	0.472	6.794

Note: Based on author's calculation and analysis; For model diagnostic testing, Kleibergen-Paap rk LM statistic and Wald F statistic were used for under-identification test and weak identification test, respectively; Chi-square statistic for endogeneity test of endogenous regressors; and Pagan-Hall general test statistic for heteroskedasticity test. The significance levels are presented in asterisks with *** p<0.01, ** p<0.05, * p<0.1.

5. Conclusion and Suggestions

Previous studies examined the effects of financial access by using access to credit facilities from financial institutions as a proxy indicator towards firms' productivity. However, it is noteworthy that there are still limited studies and unclear understanding about the impact of financial access through the acquisition of overdraft facilities as an alternative source of external financing in enhancing manufacturing firms' productivity in the context of a developing country like the

Philippines. As a result of cross-country differences related to business environment, income levels, size and depth of the financial system, financial frictions and legal constraints along with financial and non-financial indicators, simultaneity issues arise in the estimation process which poses robustness of the estimated models affirming potential impact of access to finance on manufacturing firms' productivity. Thus, it is necessary to further examine the underlying effects of financial access, proxied by access to overdraft facilities and other firm-specific factors such as the level of intensity of R&D, capital accumulation, human resources, and export participation, on firm-level productivity while addressing endogeneity and bias errors in the estimation process using an instrumental variables (IV) regression model that also integrates robust standard errors.

To accomplish this, comprehensive cross-sectional data of selected manufacturing firms were obtained from the enterprise survey facilitated and commissioned by the World Bank in year 2015. These data were utilized in the econometric analysis of this study. Firm-related factors composed of R&D, capital expenditures, human capital, and export performance, which were all denominated over the firm's annual generated sales, were used as exogenous variables. While financial access, as proxied by overdraft facilities obtained from financial institutions, served as the endogenous variable, and firm size was used as an instrument to account for endogeneity and bias errors. The findings indicated that financial access by manufacturing firms through the acquisition of overdraft facilities from financial institutions positively and significantly influenced manufacturing firm productivity (only in terms of sales productivity), despite the fact that the majority of manufacturing firms did not use this type of external financing. The findings implied that expanding and strengthening policies that help, promote, and assist manufacturing firms in the process of acquiring external funds through loans from financial institutions will enable them to boost capital funds that can be invested in projects that enhance and sustain productivity growth.

However, there is a paucity of empirical support for the direct effects of financial access via overdraft facilities on firm productivity when proxied by firm-level TFP. This conclusion contradicts the majority of empirical studies that support finance-led growth theories. Unexplained factors associated with both financial and non-financial indicators that deter firms' decision to acquire external financing, such as information asymmetries related to banks' financial offerings in terms of loan rates, maturities, and amortization schedule, application process and collateral requirements, access to technology, form of ownership and capital structure, and low income margins, may serve as major considerations for firms' non-utilization of this credit facility offered by financial institutions. Thus, future researches may delve on these uncovered issues since these may stretch deeper explanations on firms' likelihood to acquire overdraft facilities and other channels that grant external financing which may have substantial impact on long-run sustainable firm-level productivity growth.

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