

Does bank competition promote financial inclusion?

A cross-country evidence

Tra Pham*, Thai Nguyen#, Kien Nguyen⁺

*Correspondence author; Email: tra.pham@rmit.edu.vn – RMIT Vietnam, 702 Nguyen Van Linh street, District 7, Ho Chi Minh City, Vietnam

#Email: thai.nguyenvuhong@rmit.edu.vn – RMIT Vietnam

⁺Email: kien.ns@vnp.edu.vn – University of Economics Ho Chi Minh City

Running title: Does bank competition promote financial inclusion?

Abstract

The idea of financial inclusion has recently been discussed as one of the key strategies to enhance economic development (World Bank, 2014). We move this discussion forward by examining if bank competition is a crucial component enforcing financial inclusion, which is arguably a finance supply-side driven process. In this study, we compute the financial inclusion index built on Sarma (2008) approach to better reflect banks' willingness and capability to provide financial services. Applying System Generalized Method of Moments to the panel of 93 countries, we find that bank competition promotes financial inclusion.

JEL: *G21, G41, O16*

Key words: *Financial inclusion, Bank competition, SGMM*

Acknowledgement: *This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.01- 2016.21.*

1. Introduction

Financial inclusion has been extensively recognized as a major policy priority, given its significance in fostering economic development. An inclusive financial system will promote an efficient allocation of economic resources, limit the use of informal sources of finance, and enhance access to financial services (Sarma, 2008). Broadly defined, financial inclusion is a process of engaging all social groups and disadvantaged groups in having access to formal financial systems (Sarma, 2008). This definition emphasizes an integral multi-dimensional nature of financial inclusion which includes accessibility, availability and the usage of the financial system. Arguably, accessibility refers to the extent to which financial services are penetrated and accessible amongst potential users, while availability measures the extent to which the services are made available and the usage indicates whether those available and accessible services are in fact utilized (Sarma, 2008). These dimensions cover both sides of a financial system, the desire for financial services by firms and individuals and the willingness and the capability to offer financial services by financial service providers. Amongst a diverse group of financial service providers, commercial banks certainly provide the most basic form of financial services across economies (Sarma, 2008). This gives rise to a natural question as whether a competitive banking sector will promote financial inclusion, as commonly advocated by the World Bank (World Bank, 2014). As bank competition is very much a supply-side factor, one would rationally expect financial inclusion to be driven by finance providers, should the financial inclusion vary with levels of banking competition. While competition theories provide conflicting predictions on how bank competition potentially affects financial inclusion, they do agree on the point that bank competition is a significant factor influencing banks' behaviours in providing financial services (Boot and Thakor, 2000; Berger, Klapper and Turk-Ariss, 2009; Marquez, 2002). Nevertheless, the current empirical literature largely focuses on the relationship between bank competition and the finance usage, which arguably is determined dominantly by demand factors (Carbo-Valverde, Rodriguez-Fernandez and Udell, 2009; Love and Martinez Peria, 2014; and

Chauvet and Jacolin, 2017). Our study overcomes this drawback by examining the impact of bank competition on financial inclusion index initially developed by Sarma (2008), and later expanded by Sarma and Pais (2011), which reflects banks' willingness and capacity in providing financial services. In addition, the study is the first attempt to examine this relationship with System Generalized Method of Moments (SGMM) which can control for potential endogeneity problems and uncover the dynamics of financial inclusion process (Arellano and Bond, 1991; Arellano and Bover, 1995).

The paper has contributions on two fronts. First, the study extends the competition theories to incorporate banks' willingness and capacity in enhancing financial inclusion. Second, the study sheds lights on the empirical evidence on the relationship between bank competition and financial inclusion. The study finds that bank competition promotes financial inclusion.

2. Literature Gap

Theory offers competing views on how bank competition affects the efficiency of the banking sector and hence financial inclusion. The market power hypothesis argues that in a competitive banking system, banks endowed with low profit margins may try to expand their outreach and raise efficiency, and/or to become more client-driven (Boot and Thakor, 2000), thereby enhancing the availability and accessibility of financial services. In addition, competitive banks losing their market power might take excessive risks to increase returns by providing loans to marginal loan applicants (Berger, Klapper and Turk-Ariss, 2009). The quality of the loan portfolio may deteriorate but the outreach increases, improving the take-up rate of credit services. Hence, a more competitive banking sector reaches out more to individuals and firms through promoting different dimensions of financial inclusion. Nevertheless, more competitive markets reduce banking monopoly rents which make banks lower their risk exposure (Berger et al., 2009). Hence, bank competition introduces a hurdle to the accessibility of financial services.

Another strand of literature grounded in the information hypothesis highlights that bank competition may not favour financial inclusion. Due to information asymmetries, banks need to screen loan applicants for their creditworthiness. A more competitive environment reduces the incentives of banks to screen their loan applicants *ex ante* due to information externality (Marquez, 2002, Hauswald and Marques, 2006). As a result, the

more banks in the credit market, the lower probability that a bank will grant a loan (Marquez, 2002), which adversely affects the actual usage of financial services and hence financial inclusion.

Whilst theory remains inclusive on the role of bank competition on financial inclusion, empirical evidence also provides mixed results. Earlier studies find that firms are more likely to obtain financing when credit markets are more concentrated and information acquisition is more sufficient (Petersen and Rajan, 1995), while others conclude a positive relation between concentration and credit constraints at firm level (Beck et al., 2004; Chong et al., 2012). Recently, Carbo-Valverde et al. (2009) discover that bank competition relieves financing constraints among Spanish firms. Love and Martinez Peria (2014) find that firms' access to finance is improved with bank competition. Chauvet and Jacolin (2017) show that, the positive impact of financial inclusion - measured by the share of firms at the industry level which have access to bank credit - on firm growth is strengthened under a less concentrated bank market. The literature exclusively focuses on access to finance as a proxy for financial inclusion for the country. While access to finance is apparently an important indicator of the actual usage of financial services available, it is confined to reflecting own risk characteristics and financing needs by borrowers. Such an indicator leaves out supply factors such as banks' willingness and ability to expand the accessibility and the availability of financial services. Admittedly, the focus on a single aspect fails to capture the broad extent of financial inclusion (Sarma and Pais, 2011) and also fails to reflect the channels through which bank competition may affect financial inclusion for the country. We address this literature gap by computing the financial inclusion index following Sarma (2008) approach. Sarma and Pais (2011) use the index of Sarma (2008) to empirically associate financial inclusion with country specific development factors proxied by three groups of variables, namely socio-economic factors, infrastructure and the banking sector. For the latter relationship, the authors consider various indicators of the soundness of the banking system such as the non-performing assets, the capital asset ratio, ownership structure and interest rate. Whereas motivated by Sarma and Pais (2011), our study provides further insights on the relationship between the banking sector and financial inclusion by exclusively examining if bank competition is one of the key factors enforcing financial inclusion, given a complex nature of this relationship as predicted by theories. The comprehensive

measurement of financial inclusion index would allow us to capture the bank-driven incentives in providing financial services.

3. Data and Regression Strategy

3.1. Data

We collect data from the Global Financial Development Database by the World Bank for 93 countries over 15 years (2000 – 2014) (the list of countries is provided upon request). Drawn on Sarma (2008), we construct two separate financial inclusion indexes for firms and individuals from three aspects, namely accessibility; availability and the actual usage of financial services. We select two indicators, namely, bank accounts per 1000 adults and account at a formal financial institution to be included in accessibility/penetration; and ATMs per 100,000 adults and bank branches per 100,000 adults to reflect availability. The actual usage of the individual group is measured by two indicators: loan from a financial institution and saving at a financial institution. For firms, the actual usage includes the take up rate of both credit services and deposit services. Whereas Sarma (2008) uses the ratio of credit and deposit to GDP to proxy for the usage dimension for the whole country, our approach allows for a separation between firms and individuals. Each indicator for each economy is measured on the basis of 3-year average values from 2000 – 2014, which provides 5 period values for each indicator. Following Sarma and Pais (2011) and Park and Mercado, Jr. (2015), we argue that period values counter annual fluctuations and allow as many economies as possible to be included in our sample.

For every country at a given time, a dimension/indicator index, d_i for the i^{th} dimension is derived by Equation (1). Note that the higher value of d_i , the higher achievement in that particular dimension.

$$d_i = \frac{A_i - m_i}{M_i - m_i} \quad (1)$$

where A_i is the actual value of indicator i of the country, m_i is the minimum value of indicator i and M_i is the maximum value of indicator i across countries at the time t . The financial inclusion index for country i across n dimensions/indicators, separate for firms and individuals, is then computed by the normalized inverse of Euclidean distance of point d_i computed in Equation (1) from the ideal point I which is equal to 1. Specifically, the financial inclusion index is computed as follows:

$$FI_i = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \dots + (1-d_n)^2}}{\sqrt{n}} \quad (2)$$

The index is normalized so that the computed values lie between 0 and 1 and the higher values of the index correspond to higher financial inclusion, following Sarma (2008).

3.2. Regression Strategy

We specify the following model to examine the impact of bank competition on financial inclusion:

$$FI_{i,t} = FI_{i,t-1} + Competition_{i,t-1} + Concentration_{i,t-1} + Inefficiency_{i,t-1} + NPL_{i,t-1} + GOV_{i,t-1} + Profitability_{i,t-1} + GDPPC_{i,t-1} + \varepsilon_{i,t-1} \quad (3)$$

Where FI is the financial inclusion index for country i at time t . For bank competition, we opt for the Boone index (2008) and Lerner index (1995) alternatively. Lerner index reflects the difference between output prices and marginal costs, and hence capturing the competition levels as banks with more power are able to set higher prices relative to their costs (Lerner, 1995). Based on that idea, Boone index (2008) further modifies and measures the competition as the ratio of profit elasticity to marginal costs. Lower Boone and Lerner indexes imply stronger competition. Following Sarma and Pais (2011), we control for country-specific level variables, namely bank concentration, bank inefficiency, bank profitability, non-performing loan (NPL) and levels of economic development (GDPPC - real GDP per capita). Bank concentration is measured by the ratio of assets of three largest commercial banks to total commercial banking assets. We use bank overhead costs to total assets to proxy bank inefficiency, while bank profitability is captured by net interest margin. The variable GOV controls for crowding out effect measured as a ratio of credit to government and state owned enterprises to GDP. Data for all control variables are retrieved from the Global Financial Development Database.

Our model is fitted in a SGMM framework, which allows for financial inclusion explained by its lagged values. Lags of independent variables are included to control for reverse causality. Table 1 provides data description. The financial inclusions for firms and individuals range between 0 and 1, with the mean values of 0.617 and 0.625, respectively.

Table 1. Data description

Variable	Obs	Mean	Std. Dev.	Min	Max
FI – Individual	748	0.625	0.310	0.000	1.000
FI – Firm	773	0.617	0.306	0.000	1.000
Competition -Boone	844	-0.070	0.135	-0.909	1.060
Competition - Lerner	654	0.273	0.132	-0.434	0.871
Concentration	786	73.663	19.264	22.634	100.000
Inefficiency	908	3.950	3.282	0.055	48.733
NPL	553	7.044	7.115	0.000	65.550
GOV	857	9.322	10.639	0.016	72.922
Profitability	901	4.795	2.893	0.032	20.341
GDPPC	874	16834.210	19122.330	356.945	153435.000

4. Data Analysis

Table 2 reports the regression results. The dynamics of financial inclusion is confirmed by statistically significant coefficients associated with the lagged value of financial inclusion. With regards to control variables, bank inefficiency and profitability do not have a statistical impact on financial inclusion, while non-performing loans, levels of economic development and crowding-out effect demonstrate significant impacts on financial inclusion. Most importantly, bank competition, proxied by low values of the Boone index and Lerner index, promotes financial inclusion across countries, supporting the market power hypothesis, while bank concentration is not significantly associated with financial inclusion. Our result of the positive impact of bank competition on financial inclusion is robust across the financial inclusion indices for both firms and individuals.

Table 2. Impacts of bank competition on financial inclusion (FI)

Dependent variable: FI	Boone Index		Lerner Index	
	Firm	Individual	Firm	Individual
FI (lag 1)	0.44*** (0.035)	0.175*** (0.048)	0.369*** (0.031)	-0.068 (0.046)
Competition (lag 1)	-0.206*** (0.039)	-0.326*** (0.051)	-0.642*** (0.078)	-0.229*** (0.084)
Concentration (lag 1)	000 (0.000)	0.001* (0.001)	0.001 (0.001)	0.002*** (0.001)
Inefficiency (lag 1)	000 (0.006)	0.01 (0.008)	-0.039*** (0.007)	-0.002 (0.007)
NPL (lag 1)	0.009*** (0.001)	0.004*** (0.001)	0.009*** (0.001)	0.003*** (0.001)
GOV (lag 1)	-0.003*** (0.001)	0.002 (0.001)	-0.001 (0.001)	0.003*** (0.001)
Profitability (lag 1)	-0.007 (0.005)	0.005 (0.007)	0.049*** (0.006)	0.027*** (0.006)
GDPPC (lag 1)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Number of observations	257	242	237	223
Number of groups	93	93	85	85
Number of instruments	79	75	79	74
P-value for Arellano-Bond test AR(1)	0.029	0.000	0.028	0.001
P-value for Arellano-Bond test AR(2)	0.294	0.217	0.415	0.346
P-value for Hansen test	0.455	0.238	0.376	0.212

***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

5. Conclusion

This study examines the impact of bank competition on financial inclusion which is argued to be driven by banks' willingness and capability that previous studies fail to differentiate between demand versus supply factors. The study documents evidence in support of the market power hypothesis, which suggests that bank competition encourages financial inclusion across 93 countries. This finding suggests that promoting banking competition should be considered as a promising agenda to relieve constraints in finance accessibility, availability and usage.

Reference

- Arellano, M., and Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2), 277–297.
- Arellano, M., and Bover, O. (1995). Another look at the instrumental variables estimation of error components models, *Journal of Econometrics*, 68(1), 29-51.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit and Banking*, 627-648.
- Berger, A. N., Klapper, L. F., & Turk-Ariss, R. (2009). Bank competition and financial stability. *Journal of Financial Services Research*, 35(2), 99-118.
- Boone, J. (2008). A new way to measure competition. *The Economic Journal*, 118(531), 1245-1261.
- Boot, A. W., & Thakor, A. V. (2000). Can relationship banking survive competition? *The journal of Finance*, 55(2), 679-713.
- Carbó-Valverde, S., Rodríguez-Fernandez, F., & Udell, G. F. (2009). Bank market power and SME financing constraints. *Review of Finance*, 13(2), 309-340.
- Chauvet, L., & Jacolin, L. (2017). Financial Inclusion, Bank Concentration, and Firm Performance. *World Development*, 97, 1-13.
- Chong, T. T., Lu, L., & Ongena, S. (2012). *Does Banking Competition Alleviate or Worsen Credit Constraints Faced by Small and Medium Enterprises? Evidence from China (Replaces CentER DP 2011-006)* (No. 2012-013).
- Hauswald, R., & Marquez, R. (2006). Competition and strategic information acquisition in credit markets. *The Review of Financial Studies*, 19(3), 967-1000.
- Lerner, A. (1995). The concept of monopoly and the measurement of monopoly power. In *Essential Readings in Economics* (pp. 55-76). Macmillan Education UK.
- Love, I., & Martínez Pería, M. S. (2014). How bank competition affects firms' access to finance. *The World Bank Economic Review*, 29(3), 413-448.
- Marquez, R. (2002). Competition, adverse selection, and information dispersion in the banking industry. *The Review of Financial Studies*, 15(3), 901-926.
- Park, C. Y., & Mercado, R. (2015). *Financial Inclusion, Poverty, and Income Inequality in Developing Asia* (No. 426). Asian Development Bank Economics Working Paper Series.

- Petersen, M. A., & Rajan, R. G. (1995). The effect of credit market competition on lending relationships. *The Quarterly Journal of Economics*, 110(2), 407-443.
- Sarma M. 2008. Index of financial inclusion. *ICRIER Working Paper No 215, June 2008*.
- Sarma, M., & Pais, J. (2011). Financial inclusion and development. *Journal of international development*, 23(5), 613-628.
- World Bank. 2014. *Global Financial Development Report 2014: Financial Inclusion*. Washington, DC.