# Bank competition and Economic growth: Evidence from Indian economy

Madhur Bhatia
Senior Research Scholar, Department of Humanities and Social Sciences, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India, Email: madhureco247@gmail.com

Gaurav Mittal
Senior Research Scholar, Department of Humanities and Social Sciences, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India, Email: gmittal@ma.iitr.ac.in

## Introduction

During the recent years, research on bank competition seeksa plethora of attention from researchers, regulators and policymakers across the world, with primary focus on measuring competitive conditions of banks; investigating the determinants of bank competition and association of bank competition with their stability (Clark et al., 2018). However, the recent strand of literature has initiated focussing on analysing whether the bank competition has any considerable influence over the economic growth of a nation (see for instance, Carbó-valverde et al., 2002; Claessens and Laeven, 2005; Coccorese, 2008; Banya and Biekpe, 2016; among others). The prevailing literature claims that level of financial markets' development and competition has significant repercussions for productivity gains and capital accumulation, and ultimately for economic growth (Levine and Zervos 1998; Beck, Demirgüç-Kunt, and Lozaya 2000; Levine 2005; Loayza and Rancière 2006; Hasan et al. 2009; among others). Nevertheless, theoretical research does not show a consensus over the relation between market power and economic growth. For instance, the conventional theory of economics states that high-interest rates and increased cost of financingcharacetrizes the high market power situation as compared to the situation in the perfect competition (MaudosandGuevara, 2006). It has been argued that financial development, initiating the effective financial intermediation, substantially expedites the growth of an economy through the means of numerous channels like technology transfer, mobilisation of deposits, risk diversification (Levine, 2003; Pradhan et al., 2016). Thus, the monopoly power is associated with the social inefficiency and lesser number of investment projects and thereby, adversely affecting the potential economic growth. But no consensus is reached in the context of the influence of market power on the quantity of lendable funds. For instance, Boot and Thakor (2000) argued that in a non-competitive market, the availability of finance is higher; similarly, Dell'Ariccia and Marquez (2004) stated that higher engagement in relationship banking in monopoly power facilitates the credit availability. On the other hand, the existence of informational monopoly also has the potential of being caught up in 'hold up problem', that might lower the demand for external finance. Thus, the non-consensus over the relation between market power and economic growth has attracted attention from world-wide researchers. But the majority of the studies pertain to developed nations and cross-country context, with few focussing on developing and emerging economies.

Thus, this study aims to explore the nexus between competition among banking firms and economic growth in one of the fastest emerging nation, India which we feel would be significant to consider due to below-mentioned reasons and would have implications for other bank-based economies like Pakistan. First, India has a systematically important bank-based economy. It implies that the entire economy would be adversely affected by the shocks happening in the banking industry (Demirguc-Kunt andLevine,1999). Second, an array of significant reforms has been established during the recent years in Indian banking industry (like Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002; Insolvency and Bankruptcy Code, 2016; strategic debtre structuring (SDR) and the scheme for sustainable structuring of stressed assets (S4A) and recapitalisation of public sector banks)which further enhanced the competitive pressures on the Indian banks. Third, though Indian banking industry has sequestered from the global financial crisis, it triggered the numerous developments that have compelling implications for banks competition, including increased demand for bank credit; and deterioration in profitability, interest margin and off-balance sheet activities of banks. Therefore, these reasons form the primary motivation for addressing the pertinent research question: whether economic growth of India is affected by the level of bank competition? To achieve our research objective, we adopt a two-stage estimating approach. The first stage pertains to the measurement of market power of Indian banks using Learner index, and in the second stage, we estimate the relation between economic growth and market power (as computed in the first stage) by employing panel data estimating approach.

The study endeavours to contribute to the bank competition literature in two ways. First, the existing studies focusing on banking industry in India primarily relates to measuring the level of competition of banks and its determinants (see, for instance, Li et al., 2019; Arrawatia et al., 2019; Rakshit and Bardhan, 2016; Ansari, 2012; Mishra, 2011; Prasad and Ghosh, 2007). Second, we employ a more robust technique of measuring bank competition, i.e. the learner index. The New Empirical Industrial Organisation (NEIO) based approach of learner index allows us to compute competition level annually and thus offers more accurate results in second stage, related to competition-growth nexus (Guevara and Maudos, 2011). Third, few studies are exploring the relationship between bank competition and economic growth; but the majority of them have focused on cross-country analysis, primarily including developed nations in their analysis. However, due to differences in institutional and regulatory structure of developing and emerging nations, the findings of developed countries cannot be generalised to these nations. Thus, few attempts have been made in recent years to explore this nexus in the context of developing and emerging economies (see, for instance, Banya and Biekpe, 2016 for African countries). Concerning Indian banking industry, the literature on competition of banks is scarce (see, for example, Prasad and Ghosh, 2007; Zhao et al., 2010; Das and Kumbhakar, 2016), with majority of them applying P-R statistic and none of the existing studies have assessed the impact of market power of banks on economic growth of India. Thus this is the novelty of the present study, i.e. to explore the linkages between bank competition (or market power), using NEIO based approach Learner index approach and the economic growth of India for the period from 2008-09 to 2017-18.

The rest of the paper is designed as follows. Reviewofthe extant literature is detailed in section two. Section three describes the empirical methodology, specification of variables and database. The empirical findings are provided in section four,and the final section is concluding in nature.

## Empirical methodology and data

### Method

*Estimating bank competition: Learner's Index*

Following Berger et al., (2009), we compute the bank competition (market power) of Indian banks by Learner index. It measures the market power by marking up the price over the marginal cost of total assets. It is to be noted that the larger difference between price and marginal cost represents higher market power. Thus, larger values of learner index indicate higher market power and lower level of competition among banks.

The following equation is employed to compute the learner index for each bank:

$$learner_{it} = \frac{P(TA)_{it} - MC(TA)_{it}}{P(TA)_{it}} \qquad (1)$$

Where $learner_{it}$ represents the learner index of $i^{th}$ bank in $t^{th}$ time period; $P(TA)_{it}$ is the price of output, measured by the ratio of interest and non-interest income to total assets of $i^{th}$ bank in $t^{th}$ time period; and $MC(TA)_{it}$ is the marginal cost for bank $i$ in a particular year $t$.

The marginal cost is computed using the below-mentioned translog function and obtain $\beta_1$, $\beta_2$ and $\varphi_k$:

$$\ln Cost_{it} = \beta_0 + \beta_1 \ln Q_{it} + \frac{1}{2}\beta_2 \ln Q_{it}^2 + \sum_{k=1}^{2} \gamma_{kt} \ln W_{k,it} + \sum_{k=1}^{2} \varphi_k \ln Q_{it} \ln W_{k,it} + \sum_{k=1}^{2}\sum_{j=1}^{2} \phi_{kj} \ln W_{k,it} \ln W_{j,it} +$$

$$\delta_1 T_t + \delta_2 T_t^2 + \delta_3 T_t \times \ln Q_{it} + \sum_{k=1}^{2} \tau_k T_t \times \ln W_{k,it} + \varepsilon_{it} \qquad (2)$$

Where, $Cost_{it}$ is the total cost of bank $i$ in year $t$; total assets ($Q_{it}$) represents the total output of a bank; $\ln W_{k,it}$ measures the input prices, $w_1$ is the price of labour and capital and $w_2$ is the price of borrowed funds. The price of labour and capital is measured as the ratio of non-interest expenses to total assets (see E. Clark et al., 2018; Bonin et al., 2005; Hasan and Morton, 2003) and price of borrowed funds is computed as the ratio of interest expenses to total deposits (see E. Clark et al., 2018; Berger et la., 2009). Time dummies are introduced in the model to capture the changes in translog function over a period of time, and $\varepsilon_{it}$ is an idiosyncratic error term. The clustered standard errors at bank-level are incorporated to estimate the translog function. And finally, the marginal cost is obtained as follows:

$$MC(TA) = \frac{Cost_{it}}{Q_{it}}\left[\beta_1 + \beta_2 \ln Q_{it} + \sum_{k=1}^{2} \varphi_k \ln W_{k,it} + \delta_3 T_t\right] \qquad (3)$$

The marginal cost thus obtained from equation (3) is substituted in equation (1) and learner index is computed for each bank and then it is included in the estimation of our primary empirical model (discussed in the next sub-section).

*3.1.2 Estimating relation between bank competition and economic growth*

To investigate the impact of bank competition on the economic growth of India, we adopt the following econometric model:

$$Growth_{it} = \alpha + \beta learner_{it} + \gamma controls_{it} + \varepsilon_{it} \qquad (4)$$

$Growth_{it}$ represents the economic growth of the Indian economy, measured by GPD growth rate; $learner$ is the learner index (computed using the above methodology) and $controls_{it}$ are the macro-economic variables, including inflation and trade openness. Inflation is included to control for the macro-economic stability and is calculated as an annual growth rate of consumer price index.Further, we control for the trade openness of the economy, measured as trade ratio (see Banya and Biekpe, 2016). We estimate the above model using the panel method approach. The choice between fixed effects and random effects is made using a Hausman test. The robust standard errors clustered at bank level are employed to avoid the problem of heteroscedasticity and autocorrelation[1].

**Data**

The study is based on a balanced panel of 40 Indian banks, operating during the period from 2008-09 to 2017-18. The dependent variable in our research is the growth rate of real per capital GDP. The bank competition is our primary independent variable, which is measured by Learner index (as illustrated in the above section). The required data on bank-specific variables and macro-variables are collected from the Statistical Table Relating to Banks in India, a publication of Reserve Bank of India and World Development Indicators, provided by World Bank.

**Empirical results**

**Estimation of bank competition**

This section briefs the estimates of bank competition as measured by Learner index. The translog cost estimation function is estimated to compute the marginal cost, which is then used to determine the learner index. The average learner index value is shown in Table 1. The value has increased from 21.94% in 2009 to 24.17% in 2018. The

findings reflect that during the initial period of analyses, i.e. from 2009 to 2012, the market power of Indian banks has increased, as depicted by a rise in learner index. The increase in the index might be due to the consolidation of Indian banks, owing to the restructuring of weak banks (Sensarma and Jayadev 2007). However, from 2012 to 2015, the market power has shown a considerable decline, thereby indicating an improvement in the competitive condition of Indian banks. Further, the recent policies of bank mergers and amalgamations have been reflected in the increasing value of learner index, thereby leading to an increase in the market power of Indian banks.

Table 1: Marginal costs and the Learner index

| Year | MC | LI |
|---|---|---|
| 2009 | 0.071 | 0.219 |
| 2010 | 0.064 | 0.226 |
| 2011 | 0.061 | 0.240 |
| 2012 | 0.072 | 0.223 |
| 2013 | 0.073 | 0.220 |
| 2014 | 0.073 | 0.216 |
| 2015 | 0.074 | 0.217 |
| 2016 | 0.072 | 0.211 |
| 2017 | 0.068 | 0.237 |
| 2018 | 0.063 | 0.242 |

Source: Authors' calculations.

**Estimates of association between market power and economic growth**

This section presents the findings of regression examining the relationship between bank competition (market power) and economic growth. Our primary estimation technique is a random effects panel model (reported in Panel A), and the estimates from the fixed-effects model. It provides us with the robustness of our findings, as indicated by the consistent direction and significance level of coefficients across both the models. The results suggest that market power has a negative and significant impact on economic growth. It depicts that a 1% increase in the market power reduces the growth of an economy by 41% during the period of study. Thus, we find that higher competitiveness of the Indian banking industry is associated with the higher growth of an economy.

Further, the trade openness, as measured by trade ratio, also negatively and significantly affects the growth of the economy. This might owe to the volatile nature of the exchange rate that could adversely affect the investment and economic growth rate (Bleaney and Greenaway, 2001). The finding is consistent with those of Banya and Biekpe (2016) concluding an inverse relation between trade openness and economic growth for African countries during the period from 2005 to 2012. Inflation rate is also observed to affect the economic growth of India significantly. It indicates that a 1% increase in the rate of inflation, the economic growth rate increase by approx. 28% during the sample period. And finally, the ratio of equity to total assets is associated with a lower growth rate.

**Table 2: Competition and Economic Growth: estimates of panel model**
**Dependent variable: GDP growth rate**

| | Panel A: Random effects | | Panel B: Fixed effects | |
|---|---|---|---|---|
| Independent variables | Coefficient | Robust SE | Coefficient | Robust SE |
| LI | -0.417*** | 0.145 | 1.483** | 0.642 |
| Z-score | 0.0009 | 0.00005 | 0.00001 | 0.00008 |
| Trade | -0.238*** | 0.0007 | 0.281*** | 0.002 |
| INF | 0.283*** | 0.001 | -0.237*** | 0.0.001 |
| Constant | 16.368*** | 0.046 | 16.578*** | 0.135 |
| NONIT | 0.020 | 0.053 | 0.025 | 0.057 |
| EQTA | -0.031*** | 0.011 | -0.033** | 0.015 |

Notes: *,**,*** shows statistical significance at 10, 5 and 1 per cent levels, respectively; LI is Learner Index; NONIT is ratio of non-interest income to total income; EQTA is ratio of equity to total assets; Z-score is the measure of risk; Trade is trade openness, measured by trade ratio; INF is the annual growth rate of consumer price index.

Source: Authors' calculations.

## Conclusion

The study investigates the nexus between bank competition (or market power) and economic growth in the Indian banking industry using the sample of 40 banks during the period from 2008-09 to 2017-18. We performed our analysis in two-steps, whereby in the first stage, we measure the level of bank completion in Indian banking industry using NEIO based approach Learner index approach. The findings reflect that during the initial period of analyses, i.e. from 2009 to 2012, the market power of Indian banks has increased, owing to the consolidation of Indian banks, owing to the restructuring of weak banks. However, from 2012 to 2015, the market power has shown a considerable decline, thereby indicating an amelioration in the competitive condition of banks. And finally, the recent policies of bank mergers and amalgamations initiated by regulators have been reflected in the increasing value of learner index, thereby leading to an increase in their market power. At the second stage, we employ the random effects panel model to investigate the influence of bank completion (or market power) on the growth of an economy. The estimates indicate an inverse and significant relation between market power and economic growth. The result shows that a 1% increase in the market power (i.e. indicated by learner index) leads to a 41% decline in economic growth. Further, the control variables like inflation, trade openness and EQTA are also to be significantly affecting the growth rate. '

Thus, based on our findings, our studyadvocates that bank competition matter for the overall growth of an Indian economy. It indicates that higher completion among banks is associated with higher growth of an economy. Our result is significant for other emerging economies as well, which have a bank-based economy like Pakistan. The outcomes of our study have policy implications for regulators, specifically in the light of recent reforms in banking sector related to mergers and amalgamations. The latest bank mergers have led to an increase in market power with the banks and thus reduced the bank competition, as indicated by a rise in learner index during the last three years of study. Accordingly, based on our findings, we suggest that policymakers should initiate such policies that target to enhance the competitive environment among banks. This would ultimately posit a potential affirmative impact on economic growth.

## References


Arrawatia, R., Misra, A., Dawar, V.and Maitra, D. (2019). Bank Competition in India: Some New Evidence Using Risk-Adjusted Lerner Index Approach. Risks, 7(2), 44.

Banya, R. M., and Biekpe, N. (2017). Bank competition and economic growth: empirical evidence from selected frontier African countries. Journal of Economic Studies, 44(2), 245-265.

Beck, T., A. Demirgüç-Kunt and N. Lozaya. 2000. Finance and sources of growth. Journal of Financial Economics 58 (1–2), 261–300.

Berger, A.N., Hasan, I. and Zhou, M. (2009), Bank ownership and efficiency in China: what will happen in the world's largest nation, Journal of Banking and Finance, 33 (C), 113-130.

Bleaney, M. and Greenaway, D. (2001), The impact of terms of trade and real exchange rate on investment and growth in Sub-Saharan Africa, Journal of Development Economics, 65 (C), 491-500.

Bonin, J.P., Hasan, I.and Wachtel, P., (2005). Bank performance, efficiency and ownership in transition countries. J. Bank. Finance 29 (C), 31–53.

Boot, A.W.A. and A.V. Thakor (2000), Can relationship banking survive competition?, Journal of Finance, 55(2), 679–713.

Carbó-valverde, S.,Gardener, E.P.M. and Williams, J.(2002), Efficiency in banking: empirical evidence from the savings banks sector, Manchester School, 70 (2), 204-228.

Cetorelli, N. and Gambera, M. (2001), Banking market structure, financial dependence and growth: international evidence from industry data, Journal of Finance, 56 (C), 617-648.

Claessens, S. and Laeven, L. (2005), Financial dependence, banking sector competition, and economic growth, Journal of the European Economic Association, 3(C), 179-207.

Clark, E., Radić, N.and Sharipova, A. (2018). Bank competition and stability in the CIS markets. Journal of International Financial Markets, Institutions and Money, 54 (C), 190-203.

Coccorese, P. (2008), An investigation on the causal relationships between banking concentration and economic growth, International Review of Financial Analysis, Vol. 17 No. 3, pp. 557-570.

Dell'Ariccia, G., and Marquez, R. (2004). Information and bank credit allocation. Journal of Financial Economics 72 (1), 185–214.

de Guevara, J. F.and Maudos, J. (2011). Banking competition and economic growth: cross-country

evidence. The European Journal of Finance, 17(8), 739-764.

Hasan, I., Koetter, M. and Wedow, M.(2009). Regional growth and finance in Europe: Is there a quality effect of bank efficiency? Journal of Banking and Finance 33 (8), 1413–22

Hasan, I.and Marton, K. (2003). Development and efficiency of the banking sector in a transitional economy: Hungarian experience. Journal of Banking & Finance, 27(12), 2249-2271.

Li, Z., Liu, S., Meng, F.and Sathye, M. (2019). Competition in the Indian Banking Sector: A Panel Data Approach. Journal of Risk and Financial Management, 12(3), 136.

Levine, R. (2003). More on finance and growth: more finance, more growth?. Review-Federal Reserve Bank of Saint Louis, 85(4), 31-46.

Levine, R. (2005). Finance and growth: Theory, evidence and mechanisms. In Handbook of economic growth, ed. Phillipe Aghion and Steven Durlauf, Chapter 12, 865–934. Amsterdam, The Netherlands: North-Holland Elsevier Publishers.

Levine, R. and Zervos, S. (1998). Stock markets, banks, and economic growth. American Economic Review 88 (C), 537–58.

Loayza, N. and Rancière, R.(2006). Financial development, financial fragility, and growth. Journal of Money, Credit and Banking 38 (4), 1051–76.

Maudos, J. and de Guevara, J. F.(2006). Banking competition, financial dependence and economic growth. MPRA Paper No. 15254

Misra, A. K. (2011). Competition in Banking: The Indian Experience. In International Conference on Economics and Finance Research.

Pradhan, R. P., Arvin, M. B.and Hall, J. H. (2016). Economic growth, development of telecommunications infrastructure, and financial development in Asia, 1991–2012. The Quarterly Review of Economics and Finance, 59 (C), 25-38.

Prasad, A. and Ghosh, S.(2007). Competition in Indian Banking: An Empirical Evaluation. South Asia Economic Journal 8 (2), 265–284.

Rakshit and Bardhan (2019) Bank Competition and its Determinants: Evidence from Indian Banking, International Journal of the Economics of Business, 26 (2), 283-313,

Sensarma, R. and Jayadev, M.(2007). Mergers in Indian Banking: An Analysis. South Asian Journal of Management, 14 (4), 20–49.

Tianshu, Z., Casu, B. and Ferrari, A. (2010). The impact of regulatory reforms on cost structure, ownership and competition in Indian banking. Journal of Banking & Finance 34 (C), 246–54.

**Endnotes:**

1. We perform two pre-estimation tests i.e. the Wooldridge test for autocorrelation and Breusch Pagan test for testing heterescedasticity in our dataset.