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Banking sector competitiveness: Does competition for off-balance sheet banking matter?

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ABSTRACT

Despite core banking, banks also engage in off-balance-sheet (OBS) market activities. In many developed banking industries, OBS activities have grown to be significant during the last two decades. This paper provides rather scarce evidence on the competitiveness among banks for OBS activities and its impact on the degree of banking sector competition in Sri Lanka. Panzar-Ross H statistic approach employing in this study to estimate bank competition used a comprehensive set of bank-level data of the whole commercial banking sector in Sri Lanka covering the period 1996-2018. The first-round analysis of the study uncovers substantial differences among banks concerning the OBS activities. EGLS panel estimation procedure applied in this study provides evidence for a lower level of competitiveness among Sri Lankan banks for OBS activities. More interestingly, the findings further reveal that the degree of competitiveness for OBS activities has a significant positive impact on the overall competitiveness of the banking sector in Sri Lanka. These results suggest banking institutions re-visit their business models with greater emphasis on nonconventional banking activities in enhancing bank-level efficiency and hence positively contributing to the overall competitiveness of the banking sector.

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Introduction

Traditionally banks were engaged in providing loans to investors and households and fund them by attracting deposits from savers. However, in recent years, various economic forces have encouraged banks to revisit the traditional role of bank financial intermediation. Diminishing profitability of banks with traditional banking activities and understanding the importance of non-interest income to become more stable in the market have led banks to turn to new non-traditional financial activities (Kohler, 2013). This has also been due to the open market and tough regulation from the central bank (Sun et al, 2017). These efforts include a variety of activities such as issuing various types of guarantees like letters of credit, making future commitments to lend, engaging in derivatives transactions, certain loan commitments, and revolving underwriting facilities which are generally not appearing on the balance sheet. In addition to the purpose of earning additional fee income, banks also engaged in these off-balance sheet activities to increase volatility, hedge risks, avoid regulatory costs and taxes, tailor financial instruments, save capital, avoid reserve requirements as well as to face the reduced competitiveness in traditional activities. Many empirical findings too have explored interactions between noninterest income and business performance (Trivedi, 2015; Senyo et al, 2015).

Despite many studies done on banking sector competition, less attention has been paid to analyzing the nature and intensity of non-price competitiveness of the banking sector. Banks differ from one to another in many ways. It may be product diversification, innovation, service quality, or branch expansion. The effect of branch expansion has been studied by Allen and Gale (2000) and proved how branch network can provide more competitive outcomes. These banking literature suggests that banks need to compete for capturing and retaining their non-interest revenue base to be stable all the time. This greater attention on non-interest income in recent literature motivated the researcher to analyze its importance particularly from a competition point of view in a unique developing country, Sri Lanka.

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The commercial banking sector of Sri Lanka has been developed with some remarkable changes over the last two decades. After the highlights of the influential work of Mackinnon - Shaw (1973), many of the underdeveloped countries including Sri Lanka introduced a series of reforms in the financial sector. These reforms, along with the economic liberalization policies initiated in 1977 and continued thereafter made a positive change in the competitive climate of the banking sector in Sri Lanka. Many aspects of the banking sector thereafter, such as technological advancements, entry of new banks, innovative financial products and services, relaxation of financial regulations have laid the path to the present level of competitiveness and efficiency of the banking sector experienced by Sri Lanka. OBS activities exposure of the banking sector is also noticeable during this period. However, the financial sectors of many developing countries are still functioning in an environment where the most vital prerequisites for such competition are imperfect. Hence, the expected net results of development that take place in financial markets of underdeveloped countries are not fully reached and inadequately uncovered in the prevailing literature. Specifically, competition for OBS activities of banks has not been adequately addressed in recent literature on bank competition. By applying Panzar-Rosse H statistics (1987) to test bank competitiveness, the present paper aims to analyze the degree of competition in the Sri Lankan banking sector and to explore the importance of off-balance sheet activities on such competitiveness during the period 1996-2018.

The Licensed Commercial Banking sector (LCB) dominates the financial system of Sri Lanka.¹ Also, it is the most prominent single category which remarks the largest asset base and provides the highest volume of financial services to the economy. LCB sector represents 55% of the total financial sector assets and nearly 73% of total banking sector assets as of the end of 2018 (Central Bank Annual Report, 2018). The sector comprises 25 banking institutions of which 12 are foreign banks. Among 13 domestic banks, 6 larger banks are comprising four private banks and two state banks that hold the largest asset share of the banking sector hence are considered systemically important banks. The interest margin ranges between 3.5% and 3.6% during 2014-2018, whereas the Return on Investment of the whole banking sector lies between 1.1% and 1.5%. The interest income of the banking sector stood at 10.1% as a percentage of average assets and this percentage recorded as 1.3 percent from non-interest income in 2018 (Central Bank Annual Report, 2018).

Sri Lanka offers a most interesting and possibly unique setting in which to examine the bank competition for OBS activities for few reasons. *First*, the recent financial and economic crisis has highlighted the crucial position of banks in the economy. While the competitive climate in the banking sector in Sri Lanka has been growing many years, there appears to be no significant study done about the non-conventional activities of the banking sector. However, it is important to identify the kinds of reforms and environments that may help to promote efficiency in the banking systems of low-income countries. From a policy perspective, the information on competition for OBS activities enables policymakers to further understand the nature of present competitive culture and to develop policies to strengthen the financial systems quantitatively and qualitatively. *Second*, the study contributes to the existing theories by way of testing their applicability in the context of developing countries, because, the Sri Lankan financial sector is another unique setting to research as it is characterized by most of the features of emerging economies. Sri Lanka stepped into an open economy after the liberalization policies introduced in 1977. The broad idea of implementing such reforms was to enhance economic growth while improving market efficiencies to generate more benefits to the general public. The process of transition from a closed to an open market economy entails fundamental changes in behavior of enterprises in many countries. The magnitude of such impact would be higher in the context of developing countries. Most of the finance-growth theories have been tested in the U.S. or other Western country context, or in comparing a group of countries. To what extent, these theories are portable across different countries have become increasingly important with the development of financial markets in recent years.

Literature Review

Theoretical Background

Recent theoretical and empirical literature paves the path to the current debate on the economic role of competition in the banking industry. Traditional Industrial Organization models² such as Klein (1971), envisage that restrictive competitive forces create welfare losses. Therefore, increased competition in the financial sector can be vital for access of firms and households to financial services and external financing, in turn affecting bank efficiency and overall economic growth.

Theoretically, bank competition is believed to be good, as it improves efficiency, lowers loan prices, and encourages financial innovation. Banks being the financial intermediaries, maximize allocative efficiency with both the quantity of credit supply as well as their efficient allocation (Guzman, 2000). More efficient banks earn supernormal profits simply because they are more efficient than others (Fu & Heffernan, 2005). Analysis of competitive behavior assumes homogeneous and contestable markets in banking. In these markets competitive efforts certainly create efficient banks by reducing costs and maximizing rents with the improved competition. The contestability features of the banks ensure efficiency to customers through better screening and monitoring, while offering lower loan rates and attractive deposit rates. This proves an apparent causality from competition to efficiency (Schaeck and Cihak, 2014).

¹ The financial system of Sri Lanka consists of four main components. They are financial institutions, financial markets, financial infrastructure and the financial regulatory framework.

² Industrial organization (or industrial economics) is the subject that is concerned with the workings of markets and industries, in particular, the way firms compete with each other.

The literature provides many empirical studies on banking competition. These studies have used different measures to estimate the level of competition in the banking sector. Learner index³ (Lerner, 1934) is a well-known traditional measure of bank competition. It captures the variance between product prices and the marginal cost of production, which indicates the degree of market power. It is a direct measure of bank competition.

The literature also proposes various indirect measurements representing two major streams: structural and nonstructural approaches. Structural methods are based on the Structure – Conduct – Performance (SCP) paradigm, which predicts that more concentrated markets are more collusive. Under this hypothesis, competition is measured by bank concentration such as the Hirfindahl- Hirschman index (HHI) which assumes that market structure affects banks' behavior, and the Boone indicator (Boone (2000, 2004), of which the relationship between relative market shares and relative marginal costs is estimated. Non-structural approaches measuring competitiveness are based on 'New Empirical Industrial Organization' (NEIO) literature.

H statistics model was developed by Panzar and Rosse (1987). It is based on empirical analysis of the causality of factor input prices on firm-level revenues. H statistic is estimated by adding the elasticities of total revenue to its factor input prices. Shaffer (1982) reported the first application of the Rosse-Panzar test to banking data, for a sample of banks in New York. His study showed that the $H=1$ for a monopolist bank in a perfectly contestable market and a sales maximizing bank subject to break-even constraints.

Empirical Review

An empirical study of Liyanagamage (2018) reveals that greater competition has a considerable impact on efficiency improvement in the Sri Lankan banking sector and further reveals that this relation is U-shaped in the short run. It is necessary for firms to regularly introduce new technology, new processes, and financial products and reduce costs over time to be dynamically efficient. In this regard, Wonglimpiyarat (2008) studied Thailand banking sector and revealed that the competitive behavior including the strategic direction and the adoption of technology with the development of the banking economy may have positive consequences. This in turn stimulates technological development ultimately affecting dynamic efficiency. Schaeck and Cihak, (2008) used Panzar-Rosse H-statistic to test the competitiveness and found that more competitive banking systems have a lower probability of bank failure and a longer time to the crisis, and therefore are more stable than monopolistic systems. Soedarmono *et al*, (2013), analyzed a sample of 607 commercial banks in 12 Asian countries between 2001 and 2007 and investigated the link between market power in banking, bank risk taking, insolvency risk, and capital ratios. Their results bring to light that a high level of market power in banking is coupled with higher risk-taking, insolvency risk, and capital ratios.

Many subsequent studies (Nathan and Neave, 1989; Molyneux et al, 1994; Staikouras and Fillipaki, 2006) utilize the Rosse-Panzar statistic to assess competitive conditions in various developed and developing economies. The same approach was applied by Fu (2009) during the period of major structural change in the Chinese commercial banking industry (1997-2006) and found that banks in China operate under a system of monopolistic competition in general. Panzar-Ross approach has also been used in cross country studies. For example, Staikouras and Fillipaki (2006) employed this approach for the European Union and their outcome advocates that European banks were operating under conditions of monopolistic competition.

In an African banking analysis, Fosu (2013) found that the banking markets are characterized by monopolistic competition in Africa. In Angola, Barros and Mendes (2016) study found that the banking market was monopolistic. Theoretically, in a monopolistic competitive market, firms have minimum power over the market price. Hence, the banks operating in these markets compete based on product differentiation. Therefore, managers have to adopt strategies such as mergers, acquisitions, enhancing cost efficiencies, diversifying deposits and loans, and increasing non-interest revenue (Andrie and Căpraru 2014). However, the common observation that can be made in the literature is differences across countries concerning composition of the banking sector and bank income. Therefore, to what extent these findings can be generalized among countries is questionable. More precisely, the question of the magnitude of competitiveness among banks for non-interest income and its impact on banking sector competition is essentially empirical.

Research and Methodology

This study employed New Empirical Industrial Organization (NEIO) approach, which measures competition based on banks' actual behavior. Hence, Panzar - Rosse (PR) H-statistic with some modifications is used to measure the degree of bank market competition in this study. The sample covers the whole commercial banking sector of Sri Lanka which consists of 24 banking institutions as of the end of 2018 and the sample period covers 22 years starting from 1996.

The analysis is done in three consecutive steps of which the first and second steps are to measure the intensity of banking sector competition for total revenue and competition for non-interest revenue respectively (Equation 1(a) and 1(b)). In the third step, the expected impact of non-interest revenue competition on total revenue competition is tested by using Equation 2. All three econometric models were developed and tested as a panel data approach.

³ This theory was developed in 1934 by American economist Abba Lerner and is one of the most widely used tools for measuring market power.

The H statistics is estimated as the summation of elasticities of a bank's revenue to input prices in the reduced form panel equation presented in Equation 1(a).

$$\log TR_{it} = \alpha + \beta_1 \log IPL_{it} + \beta_2 \log IPF_{it} + \beta_3 \log IPC_{it} + \lambda_1 \log TA_{it} + \lambda_2 \log NPL_{it} + e_{it} \dots \dots \dots (1a)$$

This study estimates the PR model with the assumption that banks use three factors of input to produce a single output (total revenue).

In Equation 1(a), TR_{it} is the ratio of total revenue to total assets, while IPL_{it} , IPF_{it} , and IPC_{it} are the ratio of staff expenses to total assets (input price of labor), the ratio of interest expenses to total deposits (input price of deposits), and the ratio of other capital expenses to total assets (input price capital) respectively. Equation 1(a) also includes two bank variables that may shift the revenue schedule particularly due to the nature of the Sri Lankan banking system. They are bank size and nonperforming loans. TA_{it} (bank size) which incorporated to control for potential effects of bank size on bank's revenue. NPL_{it} was incorporated to control the differences in bank abilities to earn interest if resources are locked up in the non-performing assets. The measurement of NPL_{it} of this study is the ratio of non-performing loans to gross loans of the bank.

$H = \sum_{i=1}^n \beta_i$ reflects the competitive level of the market. To test the bank competitiveness for OBS activities, H statistics were re-estimated by taking non-interest revenue as the dependent variable.

$$\log NIR_{it} = \alpha + \beta_1 \log IPL_{it} + \beta_2 \log IPF_{it} + \beta_3 \log IPC_{it} + \lambda_1 \log TA_{it} + \lambda_2 \log NPL_{it} + e_{it} \dots \dots \dots (1b)$$

When estimating panel Equation 1 (a) and (b), application of Ordinary Least Squares (OLS) is not effective due to the natural correlation that exists in a time series with its past and future values in bank revenues. Therefore, this study employed Estimated Generalized Least-Squares (EGLS) procedure for the estimation.

Finally, to test the impact of the competitiveness of OBS on overall bank competition, a simple Ordinary Least Squares regression depicted in Equation 2 is estimated.

$$Com_{it} = \alpha + \beta_1 Com_{non-int} + e_t \dots \dots \dots (2)$$

In Equation 2, Com_{it} is the degree of competition for total revenue whereas $Com_{non-int}$ is the degree of competitiveness among banks for non-interest revenue.

Findings and discussion

Despite core banking, Sri Lankan banks also engage in off-balance sheet (OBS) market activities and reflect them in the non-interest income category. Before going to calculating competition scores for banks, it is worth having a closer look at summary statistics of interest and non-interest income of the Sri Lankan banking sector.

Table 1: Summary statistics of banks' interest and non-interest income

	Interest Income		Non-interest Income	
	Mean	St Dev	Mean	St Dev
1996	1381	2541	382	678
1997	1518	2757	425	706
1998	1511	2589	450	647
1999	1870	3129	474	653
2000	2162	3574	602	898
2001	3077	5127	691	1041
2002	2620	4144	712	965
2003	2277	3186	805	1043
2004	2219	3040	939	1095
2005	2982	4101	1101	1276
2006	4273	5545	1241	1430
2007	6864	9343	1486	1718
2008	8903	11824	1818	2060
2009	9038	12591	1946	2226
2010	6834	10100	2268	2606
2011	8139	10352	2278	2209
2012	11286	10980	2040	1889

Table cont'd				
2013	13474	11008	2652	2435
2014	12813	9854	2924	2223
2015	13474	10042	3332	2650
2016	17259	14237	3298	2991
2017	22161	17965	3502	3007
2018	25285	16538	4148	3205

Note: All values are in Rupees Millions: Source: Calculations by the author based on banks' Annual Reports

Figure 1: Composition of bank income

As depicted in Table 1 and Figure 1, the average values of interest and non-interest income show a general gradual increasing pattern over the sample period. However, one of the noticeable features in summary statistics of the sample is that the increased standard deviation of income, indicating a widening gap among the banks about income generation. The income from OBS activities (which are shown under non-interest income) also shows an increasing pattern during the sample period.

Then the PR H statistics for the total revenue was estimated by using the reduced form revenue equation stated above as Equation 1(a) and results are presented in Table 2. The sum of the elasticities of Equation 1(a), that is the estimated H - statistic for the sample horizon was 0.58 for the sample period. This value does not lend support for a perfectly competitive banking market in Sri Lanka, as the estimated H statistic considerably differs from 1. And, it is far from zero, suggesting no confirmation for a monopolistic condition in the banking Sri Lankan banking market. The results imply that for the observed sample period, the Sri Lankan banking sector is exemplified by a moderate level of competition for all banking activities as per the PR classification. This signifies that a raise in input prices will rise the total revenue less than proportionately. This happens due to the inelastic demand for banking services of Sri Lankan banks. As this value is in the range between 0.5 and 1, the estimated H statistic supports evidence for a moderately competitive market as far as the total revenue in the Sri Lankan banking industry is concerned. This result is quite similar to the H statistic estimated by Bikker et al (2006a).

Table 2: Estimation output of H statistics

$$\text{Log } TIR_{it} = -0.462 + 0.21 \text{ IPL}_{it} + 0.36 \text{ IPF}_{it} + 0.008 \text{ IPC}_{it} + 0.02 \text{ TA}_{it} + 0.004 \text{ NPL}_{it}$$

$$(-5.56)^{***} \quad (10.76)^{***} \quad (20.09)^{***} \quad (1.78)^{**} \quad (2.19)^{***} \quad (1.15)^{*}$$

$$R^2 = 0.75 \quad \text{F-statistics} = 213.47^{***}$$

$$\text{Durbin-Watson stat for serial correlation} = 1.99$$

$$H = \sum_{i=1}^n \beta_i$$

$$H = \beta_1 + \beta_2 + \beta_3$$

$$H = 0.21 + 0.36 + 0.008$$

$$H = 0.58$$

Notes : TIR is the dependent variable measured with the gross interest revenue to total assets.

In addition to panel regression above, time series estimates of the H statistic from 1996 to 2018 were generated by EGLS regressions of equation 1(a) to assess the change of H statistic over the sample period.

Figure 2: Degree of Bank Competition of Sri Lankan banks 1996-2018; Source: Calculations by the author

The degree of competition in the Sri Lankan banking sector during the last two decades depicts an unpredictable pattern. It has been lying around the mean throughout the sample period even though there are some ups and down along the way. One noticeable drop in the degree of bank competitiveness can be observed during the period 2007-2009. The financial crisis and the economic downturn that arose with the peak time of the civil war could be the reasons for such remarkable drops. A further analysis was carried out to investigate the non-price competition in the Sri Lankan banking sector. In the Sri Lankan banking market, the non-interest income shows high deviations across the sample period. Hence, H statistics were re-estimated by taking noninterest income as the dependent variable to understand any differences exist between price competition and non-price competition in the Sri Lankan banking sector.

The estimations of the total revenue and noninterest revenue models yield some different but interesting results. The mean H statistics for noninterest revenue for the sample period was estimated as 0.41 denoting a lower level of competition among Sri Lankan commercial banks for off-balance sheet banking. Figure 3 plots H statistics corresponding to EGLS estimations of total revenue and noninterest revenue models to investigate such interesting differences in detail. The H statistics estimated for non-interest income for the first few years of the sample period had been high and thereafter continuously lower than the competition for total revenue. The lowest level reaches during 2007-2008 where the financial crisis began. Noteworthy, H statistics for both total and non-interest revenue started rising again after 2007.

Figure 3: H Statistics: Non-interest Revenue Vs Total Revenue 1996-2018; Source: Calculations by the author

These results reveal that the competitive condition for off-balance sheet activities has been intensifying during the first few years of the sample period. This says that competition for some non-interest-bearing products has increased while competition for interest-bearing products has decreased during this period. The reason for rising competition for some products and worsening for other products can be justified by the mechanism of ‘bundling’ (Matthews et al, 2007). In this marketing mechanism, bank customers are encouraged to buy a bundle of products making it conditional to purchase some secondary products when they purchase their primary financial products. For example, a bank offering the customer a credit insurance policy with a leased facility can be mentioned. This may stop the bank customers from searching for the best for some individual product. This may be particularly true in the Sri Lankan context. Because in late 1990s domestic banks adjusted their business strategies by putting more emphasis on developing and promoting their off-balance-sheet activities in to compete with the gradually developing foreign banks. That is, banks expanded into new, non-traditional areas such as agent services, which primarily include collecting and paying household bills on customer’s behalf and acting as an agent for securities and insurance firms, etc. However, gradually banks tend to sell these non-core bank products as one product of a bundle. This has been done by giving concessions and priority to banks’ own account holders. This discouraged banks to compete for such products and from customers’ point of view, this prevents them from searching for the best individual products. Macrolevel inquiry into the patterns of banking sector competition for total revenue and noninterest revenue is also worthwhile to highlight here. While noninterest income plays an important role in banking revenues in the developed world, its contribution to the total income of most of the developing markets is very low. And hence, the competition for non-core business activities is less. In Sri Lanka, the bank competition for non-interest revenue has been significantly declining after 1999. The increasing trend in net interest margins and credit growth of commercial banks during this period might have discouraged banks to compete in the market for non-core activities. However, competition for non-core business activities of commercial banks has started

to increase after 2007. A decline in net interest margins and credit growth also observable during this period. One interesting finding is evolved with this analysis. That is, the 2007-2010 financial crises queried the essential role of financial intermediaries' stability in reinforcing a smooth transmission of credit to borrowers. While results before the crisis repeatedly doubtful on the power of the bank lending channel, more recent studies show that banks' non-core income probably have a big impact on the competitiveness in the banking sector.

Finally, the results of the OLS estimator of Equation 2 reveal a significant positive influence of competition for off-balance sheet activities on the degree of bank competition. The results are presented in Table 3.

Table 3: Results of the regression analysis Equation 3.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.372607	0.062404	5.970874	0.0000
Com _{non-int}	0.314683	0.142301	2.211394	0.0382
R-squared	0.277096	Mean dependent var		0.502174
Adjusted R-squared	0.242672	S.D. dependent var		0.072673
S.E. of regression	0.063244			
Sum squared resid	0.083995			
F-statistic	8.049513	Durbin-Watson stat		1.255172
Prob(F-statistic)	0.009870			

Note: The dependent variable is Com_{it} H statistic for Total Revenue, where $Com_{non-Int}$ is the H statistic for non-interest income.

The estimated regression coefficient for H statistics of non-interest revenue is 0.31 and it is significant at a 5% level of significance. This further stress the importance of OBS activities on the competitiveness of the banking sector. The competition for OBS activities explains about 24% of the total variation of competitiveness of the Sri Lankan banking industry as revealed in the adjusted R squared value. The F statistic and its significance also indicate that the above model better fits the observed data.

Conclusion

The empirical analysis carries out in this paper reveals that the competitiveness of Sri Lankan banks for non-interest income is at a lower level. Further, this paper provides relatively scares and strong evidence on the effect of OBS activities on the competitiveness of the Sri Lankan banking sector during the period 1996-2018. The moderate level of H statistic found in this analysis points out room for further enhancing the competitiveness among commercial banks in Sri Lanka. The findings of this paper suggest banks' active rivalry on OBS activities to pushing the degree of bank competitiveness of Sri Lanka a step forward.

The customer base of the Sri Lankan banking industry is comparatively small. Thus, all banks are competing to capture the same customers resulting in having to slash down the rate of interest to retain them. On the other hand, the high cost incurred in managing the portfolios, human capital, and overheads have become challenges to the banking sector of Sri Lanka in the recent past. Thus, the outcomes of this paper point out the need for all banks including state banks to change their operating environment significantly for making the banking industry more competitive.

Bank competition is sometimes assumed to focus only on price (interest income). However, banks as suppliers of financial services can also compete in various other ways, to increase their total income. As in most instances the interest rate depends on government policies, competition in the Sri Lankan banking sector is mostly 'non-price'. That means, to be sustainable in the future, banks need to continually act in response to market needs and should continually align their strategy to change their business model to compete for non-price. These would be the foremost challenge to reach a higher level competitive climate in the banking industry in the future.

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