An application of the Boone indicator to the South African banking sector

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Young Scholars

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Abstract: In this study, I use the Boone indicator to explore competition dynamics in the South African loan market. Using a standard pooled ordinary least squares estimation, I find that competition in the loan market was improving for most of the period between 2006 and 2016. Between 2006 and 2014 the trend was upwards, before reversing between 2014 and 2015 and then normalizing from 2015 onwards. Another important result obtained from the Boone indicator is the strength of the relationship between efficiency and competition. From the results, it is not clear that more efficient firms gain greater market shares. Therefore, I conclude that there are various exogenous factors that inhibit the sector from functioning optimally, namely regulatory, financial, and informational barriers. I recommend overcoming these factors to optimize the functionality of the sector. Recommendations include consolidating regulatory bodies, redesigning penalties, minimizing switching costs, and forcing innovation and interoperability.

1   Introduction

The importance of sound, competitive markets in an emerging market such as South Africa cannot be overstated. Competition encourages innovation, efficiency, and productivity while optimizing consumer welfare. It provides a check on complacency and ultimately helps maintain strong economic growth. Without adequate competition, managers have the incentive to exploit consumers, thereby inadvertently exacerbating some of the socio-economic issues present in the country. As this is an unwelcome prospect, implementing appropriate institutions that discourage this behaviour is imperative to maintain the integrity of the free market. In this paper, the focus is on the banking sector. Given its function in linking many other markets in the economy, it serves as a natural area of research. Within the banking sector, I have decided to focus on the loan market, for two reasons. Firstly, the loan market remains responsible for a large share of banks' profits. Secondly, the loan market, through the interest rate channel, has a natural link to consumer welfare, which policymakers will be concerned about.

To calculate the level of banking competition in South Africa, I employ the indicator recently developed by Boone (2008). The use of the Boone indicator contrasts with previous studies that have employed traditional measures such as the Panzar-Rosse H-statistic, the Bresnahan test, the concentration ratio, and the Herfindahl-Hirschman Index (HHI) (Mlambo and Ncube 2011; Simatele 2015; Simbanegavi et al. 2014). Accordingly, the results obtained from this study are slightly nuanced. For instance, for the period between 2006 and 2014, competition in the loan market is found to be improving. There is a slight reversal that takes place between 2014 and 2015, before the general trend upwards is re-established. The implications of these results for policymaking are discussed in sections 6 and 7. The methodology and data description in sections 3 and 4 precede the results in section 5, while the literature is reviewed in section 2.

2   Literature review

2.1   Prior research on banking competition in South Africa

The literature on competition can be divided into two streams: the structural approach, which emphasizes the importance of concentration to explain competition, and the non-structural approach, which ignores concentration and tries to find alternative explanations for competition. Within each of these strands are schools of thought that influence our methodological choices and contribute to the knowledge and insights present in the current literature. Within the structural stream, Mason (1939) and Bain (1951) are responsible for spreading the structure-conduct-performance (SCP) paradigm, of which the concentration ratio and the HHI also form a part. Less prominent schools of thought within this stream have subsequently challenged the SCP paradigm. These include the oligopoly theory propagated by Bikker and Haaf (2002), and the efficiency hypothesis developed by Demsetz (1973) and Peltzman (1977). The Panzar-Rosse H-statistic, increasingly recognized as the de facto method for measuring competition, forms part of the new empirical industrial organization school of thought (Bikker and Haaf 2002).

Despite the increasing prominence of non-structural measures, both structural and non-structural measures are still being applied extensively in the literature. Where sector-specific non-structural approaches have not been developed, scholars are forced to use structural measures. In other cases, scholars can only rely on structural measures due to data constraints. However, despite the benefit of sector-specific non-structural measures and reliable data, competition literature on the banking

sector remains imperfect. Accordingly, several scholars, such as Boone (2004), have attempted to improve on the existing empirical literature. Of interest is a relatively new multipurpose measure known as the Boone indicator. This measure has the distinct advantage that it provides a theory-backed method for evaluating competition dynamics across various segments. This is an improvement on attempts to modify the concentration ratio to compute competition across different products (Falkena et al. 2004). For policymakers concerned with more effective, targeted measures, this provides a significant improvement on previous measures.

In South Africa, the move away from structural measures has not been immediate. Studies by Okeahalam (2001) and Verhoef (2009) have been supported more recently by Simatele (2015). Verhoef (2009) and Simatele (2015) employ a combination of the standard concentration ratio and the HHI, while Okeahalam (2001) uses the price concentration developed by Berger and Hannan (1989) to measure concentration in the sector. The overwhelming conclusion from these studies is that the South African banking sector is highly concentrated. Moreover, Okeahalam (2001) argues that the highly concentrated nature of the sector has a direct negative impact on the welfare of consumers.

Other scholars also note the welfare costs associated with high levels of concentration. Mirzaei and Moore (2014), who use the Boone indicator for a sample of 146 countries between 1999 and 2011, argue that concentration jeopardizes competitiveness in developing countries. However, for emerging markets such as South Africa, this causal nexus between concentration and competition is absent. This view is partially supported by Clerides et al. (2015), who use the Boone indicator to confirm the increasing convergence in levels of competition across different regions and income groups. Although convincing, this narrative lacks a crucial discussion that is addressed by Delis (2012). Consistent with the new institutional school of thought, the author stresses the influence of institutions across different income groups. Moreover, Delis (2012) seems to suggest that institutional development requires greater concern than market structure (advocated by structural measures) and efficiency (advocated by non-structural measures).

The gradual shift from structural measures towards non-structural measures can also be evidenced amongst policymakers. In 2004 the National Treasury and the South African Reserve Bank (SARB) conducted a study investigating how concentration affected competition, using some of the structural methods mentioned above. Their study was followed by another by the Competition Commission in 2008, which used a qualitative approach to describe competition in the South African banking sector. In the National Treasury study, the authors provided support for a level of concentration consistent with other emerging markets (Falkena et al. 2004). Furthermore, the introduction of foreign banks in the late 1990s was noted as having been beneficial to the improvement of the cost efficiency of the four biggest banks. Despite this, the overarching conclusion was that the four biggest banks acted as a complex monopoly and should be investigated by the Competition Commission. In their analysis several years later, the Competition Commission made several recommendations, one of the key of which was the recommendation for banks to increase their transparency with the goal of lowering switching costs (Jali et al. 2008). Along with several other recommendations, this is a recommendation I believe will help improve competition in the banking sector. The rest of the recommendations are discussed further in section 6.

A more formal investigation of competition in the banking sector is provided by Mlambo and Ncube (2011). Using the Panzar-Rosse model, the authors find that the banking sector was monopolistically competitive over the period 1999–2008. Their three-step approach, which includes calculating the efficiency of banks in the sector using the data envelopment analysis method, shows that there is a need to improve bank efficiency in South Africa. These results are confirmed by other studies focused on the banking sector in South Africa. Simbanegavi et al.

(2014), who use the Panzar-Rosse model over the period 1998–2008 and the Bresnahan test between 1992 and 2008, find that i) the banking sector is monopolistically competitive, and ii) the null hypothesis of perfect competition cannot be rejected. Similarly, Simatele (2015) applies the Panzar-Rosse model over the period 1997–2014 and finds that the banking sector is indeed monopolistically competitive.

Interestingly, the Panzar-Rosse H-statistics across the various studies differ significantly over similar periods. In some cross-country studies that include South Africa, such as Bikker and van Leuvensteijn (2008), the H-statistic is found to be 0.46 between 1994 and 2004, while Claessens and Laeven (2005) find the H-statistic to be 0.85 between 1994 and 2001. If we use the H-statistic reported by Claessens and Laeven (2005), the South African banking sector ranks as one of the most competitive out of 50 countries selected from around the world. However, the H-statistic calculated by Bikker and Leuvensteijn (2008) suggests the South African banking sector is amongst the least competitive. Although this possibly has implications for the urgency with which banking competition should be addressed, the main lesson is that the banking sector is monopolistically competitive, with clear scope for improvement. This is confirmed in Table 1, which shows a wide range of H-statistics representing varying degrees of competition. An H-statistic between zero and one represents monopolistic competition; an H-statistic below zero represents a joint monopoly; an H-statistic of one represents perfect competition (Claessens and Laeven 2004). The closer the H-statistic is to one, the more competitive the sector is perceived to be.

Table 1: Cross-study H-statistics

Authors	H-statistic	Period
Kasekende et al. (2009)	0.254–0.537	1992–2006
Bikker et al. (2012)	0.46	1994–2004
Mlambo and Ncube (2011)	0.57	1999–2008
Flamini et al. (2009)	0.69	1996–2001
Simbanegavi et al. (2014)	0.69	1998–2008
Simatele (2015)	0.71	1997–2014
Claessens and Laeven (2004)	0.81	1994–2001

Source: author's compilation.

2.2 Novelty of the Boone indicator

The crucial benefit of the Boone indicator lies in its ability to provide a theoretically sound measure of competition. It has the added advantage that it allows us to capture information on various market segments within a given banking sector. Together these advantages allow us to build an economically tractable and replicable model while exploring competition dynamics across market segments in a way that aids policymaking. Despite these two advantages, the Boone indicator regrettably has drawbacks that affect the interpretation of our results. The first is that competition is measured indirectly, since the cost and price data for single banking products is not readily available. The result is that incorrect data significantly biases the results, something that is particularly concerning in small samples. Even though this criticism can be directed at other measures, it remains important to mitigate this drawback as much as possible, as is done in this paper. The other notable drawback is the assumption that banks generally pass on their efficiencies to their clients (van Leuvensteijn et al. 2008). When given the option of converting lower costs

into either higher profits or lower output prices, efficient banks are assumed to choose one of the two extremes (van Leuvensteijn et al. 2008). In reality, more efficient banks might choose a combination of the two in relation to other market-related conditions. This concern becomes important when we recommend policy measures targeted at improving efficiency and competition. Clearly, these measures should be coupled with auxiliary measures that ensure that gains in producer welfare are translated to consumers.

The Panzar-Rosse measure is subject to drawbacks of its own. According to Bikker et al. (2012), it is impossible to infer the degree of competition without information about costs, market equilibrium, and possibly market demand elasticity. This is conceivable, given that the measure was not initially intended to measure competition; rather, it was intended to provide a test against monopoly power (Clerides et al. 2015). If we assume that the Panzar-Rosse model accurately measures competition, a smaller issue exists in that it does not describe how competition evolves over time. It simply provides a less informative average for the entire period.

Amongst the structural measures, the biggest drawback is the inability to appropriately incorporate multifarious efficiencies into the models. The HHI and the concentration ratio, for instance, assume that banks are symmetric Cournot competitors (Beck 2008). Under this structure, banks are naively thought to have identical efficiencies. According to the HHI model, a reduction in entry costs automatically leads to increased competition. However, this effect changes if efficiencies differ. Incumbent firms that are more efficient benefit disproportionally from entry. As the less efficient firms are driven out of the market, the output is relocated to the more efficient incumbents/entrants, with little or no consequence for competition.

Similarly, the price-cost margin (PCM) has different interpretations when efficiencies differ across banks (van Leuvensteijn et al. 2008). Contrary to the standard result where increased competition reduces the PCM of all the banks, the average market PCM may increase if some banks are considerably more efficient than others. Once again, as inefficient firms are replaced by slightly more efficient entrants, more efficient incumbents may experience an improvement in their market share that will allow them to raise their PCM.

3   Methodology

With the above considered, I apply the Boone indicator developed by Boone (2008) and adapted by van Leuvensteijn et al. (2008) to measure competition in the South African loan market. The goal is to map the evolution of competition in the market and use the results to inform policymaking aimed at improving competition. As mentioned, bank efficiencies play an important role in the model, and are used to explain how efficiencies affect the market share of the firms in the banking sector. The rationale is that more efficient firms benefit from their cost advantages by translating them into lower prices, higher markets, and higher profits. In the model, more negative values of β in equation 3 are associated with higher degrees of competition. Below is a description of the structure we impose on the market, along with an exposition of the econometric methods used to obtain the Boone indicator.

Banks in this model face the following demand curve:

$$p\,(q_i, q_{j \neq i}) = a - bq_i - d \sum_{j \neq i} q_j \qquad [1]$$

Each bank i produces one product q_i in a market where competitors produce product q_j. Each bank in this market wants to maximize its profits $\pi = (p_i - mc_i)$ by choosing an optimal q_i, which is defined as:

$$a - 2bq_i - d\sum_{j \neq i} q_j - mc_i = 0 \qquad [2]$$

We assume the banks face constant marginal costs mc_i such that $a > mc_i$ and $0 < d \leq b$. Crucially, profits in this model exclude entry costs ε. This means that banks in this model only enter this market if their profits are greater than or equal to the entry costs ($\pi \geq \varepsilon$).

The Boone indicator (indicated by β in equation 3) is estimated using the following regression:

$$\ln s_i = \alpha + \beta \ln mc_i \qquad [3]$$

In this market, competition can increase in one of two ways (van Leuvensteijn et al. 2008). In the first instance, d asymptotically increases towards b, which describes a situation where the products produced by the banks increasingly become closer substitutes. The other instance, when entry costs ε decline, leads to a larger gap between profits and entry costs. In both instances, more efficient banks experience increases in market share as competition intensifies. Under the log-linear specification, β has a useful and intuitive interpretation. It represents the elasticity of market share relative to marginal changes in the cost structure.

The marginal cost for each bank is derived from a translog cost function. The form of the function is such that it assumes the technology of individual banks can be described using one multiproduct production function. The translog cost function, which is a second-order Taylor expansion, has the following form:

$$ln c_{it} = \alpha_0 + \sum_{t=1,...,(T-1)} \delta_t \, d_t + \sum_{j=1,...,K} \beta_j ln x_{ijt} + \sum_{j=1,...,K} \sum_{k=1,...,K} \gamma_{jk} ln x_{ijt} \, ln x_{ikt} + v_{it} \qquad [4]$$

where c_{it} represents the production costs of bank i ($i = 1, ..., N$) in year t ($t = 1, ..., T$). The variable d_t is a dummy variable which is one in year t and zero otherwise. The explanatory variables x_{ikt} represent three groups of variables ($k = 1, ..., K$). The first group (K_1) contains bank output components such as loans, securities, and other services (proxied by other income). The second group (K_2) includes input prices such as wage rates, deposit rates (as the price of funding), and the price of other expenses (proxied as the ratio of the other expense to fixed assets). Finally, the third group consists of control variables such as the equity ratio.

Furthermore, linearity in input prices and cost exhaustion is imposed on the model according to van Leuvensteijn et al. (2008) and Moyo (2018). The consequence of these two conditions is the following:

$$\beta_1 + \beta_2 + \beta_3 = 1, \gamma_{1,k} + \gamma_{2,k} + \gamma_{3,k} = 0 \text{ for } k = 1, 2, 3 \text{ and } \gamma_{k,1} + \gamma_{k,2} + \gamma_{k,3} = 0 \text{ for } k = 4,...K \qquad [5]$$

The marginal cost of loans for bank i in year t is as follows:

$$mc_{ilt} = \partial c_{it} / \partial x_{ilt} = (c_{it} / x_{ilt}) \, \partial ln c_{it} / \partial ln x_{ilt} \qquad [6]$$

where the term $\partial ln c_{it} / \partial ln x_{ilt}$ is the first derivative of equation 4 of costs to loans.

Using total income and non-interest income as the primary sources of revenue in this model, the estimations are performed using a standard pooled ordinary least squares regression.

4   Data description

The data used in the model is obtained from three different sources: Bloomberg Professional Services, the Bankscope database, and company websites. Represented in the sample are five South African banks over the period 2003–16. Table 2 lists the banks, along with various values of key variables used in the estimations. For the most part, the variables included mimic those in van Leuvensteijn et al. (2008), with the primary exception that this study focuses on a single country rather than comparing various countries over time. In this model, costs are proxied by the sum of interest expenses, personnel expenses, and other non-interest expenses. They account for eight per cent of total assets on average, while loans and securities represent 64 per cent and nine per cent respectively. Other services are proxied by non-interest income, which represents 174 per cent of total income. Wage rates are proxied by personnel expenses, and these represent 1.6 per cent of total assets. Finally, interest rate costs, which are proxied by interest expenses, represent five per cent of the total funding on average. When compared with the cross-country study conducted by van Leuvensteijn et al. (2008), the values in the columns are similar, with two exceptions: the average market share of lending, and the ratio of other services to total income (both are higher in this study). With regard to the market share of lending, this is explained by the highly concentrated nature of the South African banking sector. The anomaly in the ratio of other services to total income might be explained by the evolving nature of banks from pure mediators to investors. The dominance of the four biggest banks is represented by Capitec's significantly smaller share of lending. Table 2 also highlights Capitec's inability to reduce its costs to a level similar to other banks. For example, at 12.69 per cent, total costs account for close to double as much of the total assets as other banks. Similarly, the wage share of total assets is significantly higher than the other banks.

Table 2: Mean values of key variables for the period 2003–16

Bank	Total costs as a share of total assets	Average market share of lending	Loans as a share of total assets	Securities as a share of total assets	Other services as a share of total income	Other expenses as a share of fixed assets	Wages as a share of total assets	Interest expenses as a share of total funding
Standard Bank	4.39	29.31	44.80	4.55	190.97	129.62	0.73	5.05
Nedbank	6.74	21.97	74.83	7.98	177.87	154.94	0.91	5.72
Capitec	12.69	0.70	67.71	4.60	213.87	219.62	3.77	5.29
Absa	6.85	24.19	68.06	11.58	162.58	161.73	1.07	6.90
FNB	7.08	23.83	62.60	18.13	125.62	197.81	1.73	3.88
Average	*7.55*	*20.00*	*63.60*	*9.37*	*174.18*	*172.74*	*1.64*	*5.37*

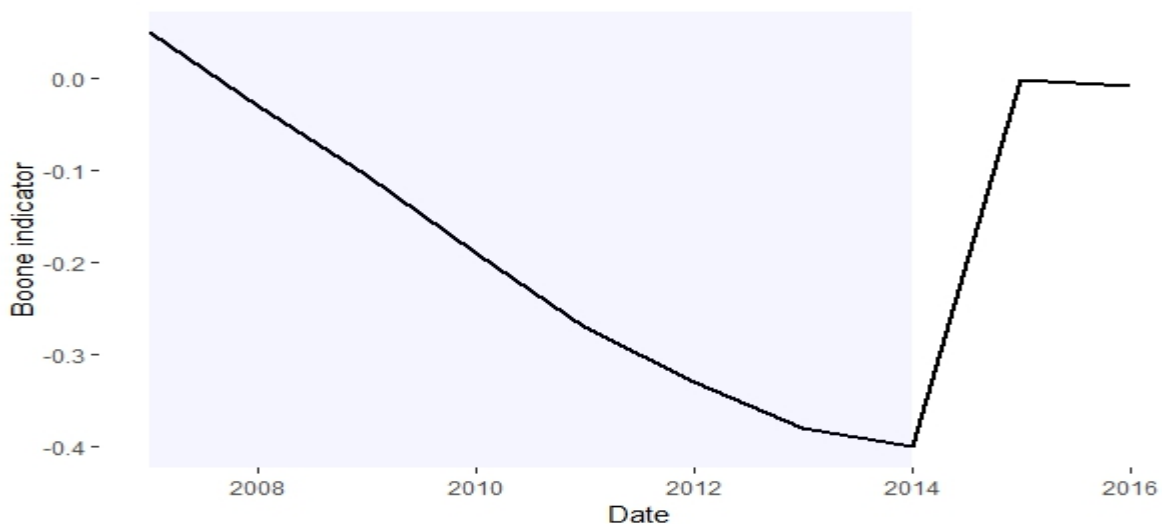Source: author's compilation based on data from Bloomberg Professional Services.

5   Results

The Boone indicator confirms some of the assertions of previous studies. Competition is found to generally be on the rise, with the last couple of years being the exception. Banks in the sector experience differences in efficiencies over time, with minimal gains in market share being extended. This is seen in Figure 1, which displays the Boone indicator between 2006 and 2016. Initially, the Boone indicator slopes downwards (representing intensifying competition), before rising sharply just after 2014. From 2015 onwards it shows signs of declining further, albeit at a slower pace than before. It is not clear why the trend reverses sharply between 2014 and 2015, but possible factors include the rise in interest rates during that period and a change in sentiment amidst a volatile political and economic environment.

Over this same period, FNB and Capitec seem to be the most efficient banks, and by extension the most competitive banks. Standard Bank and Absa, according to this model, seem to be the least competitive banks. This can be seen in Figure 2, which maps the evolution of the market share of the different banks over time. An illustration of the evolving efficiency is also provided in Figure 3, which aggregates the marginal costs of the five retail banks included in this study.
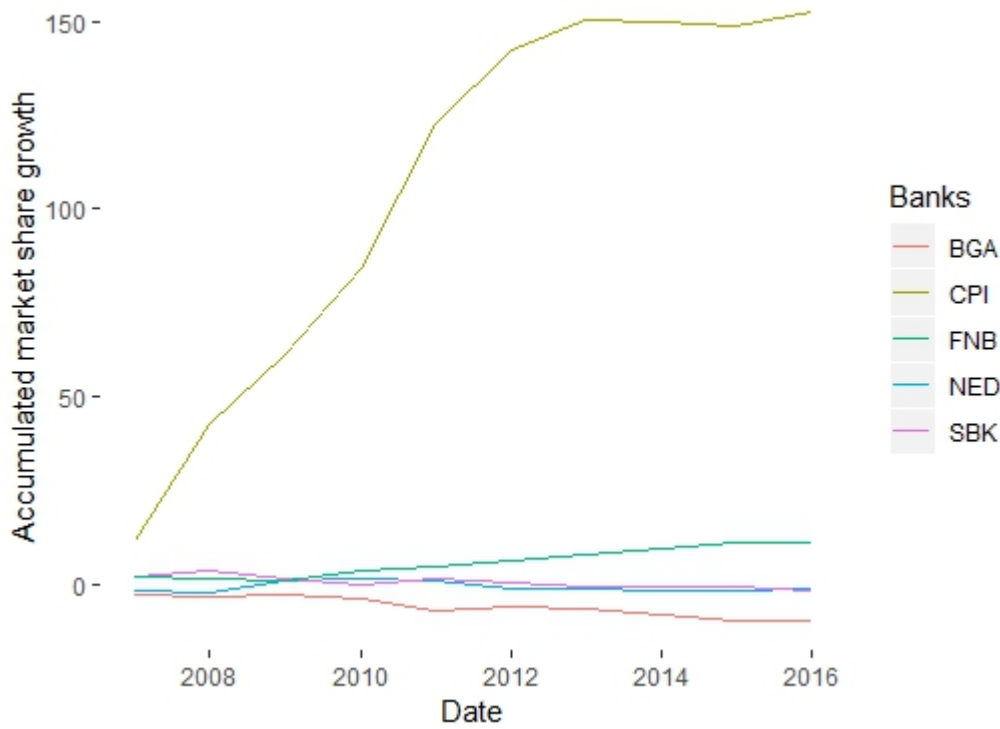
We note that the size of the sample might be an important factor in the determination of our results. Along with the relatively short period that we analyse, the inferential power of our tests may be far more limited than it seems. However, we can be reasonably confident in the results, for at least two reasons. Firstly, the model is supported by a strong theoretical background. Secondly, some of the studies in the South African banking literature use samples of similar size. Consequently, this provides encouragement that our recommendations for policymakers are adequately backed by economic theory.

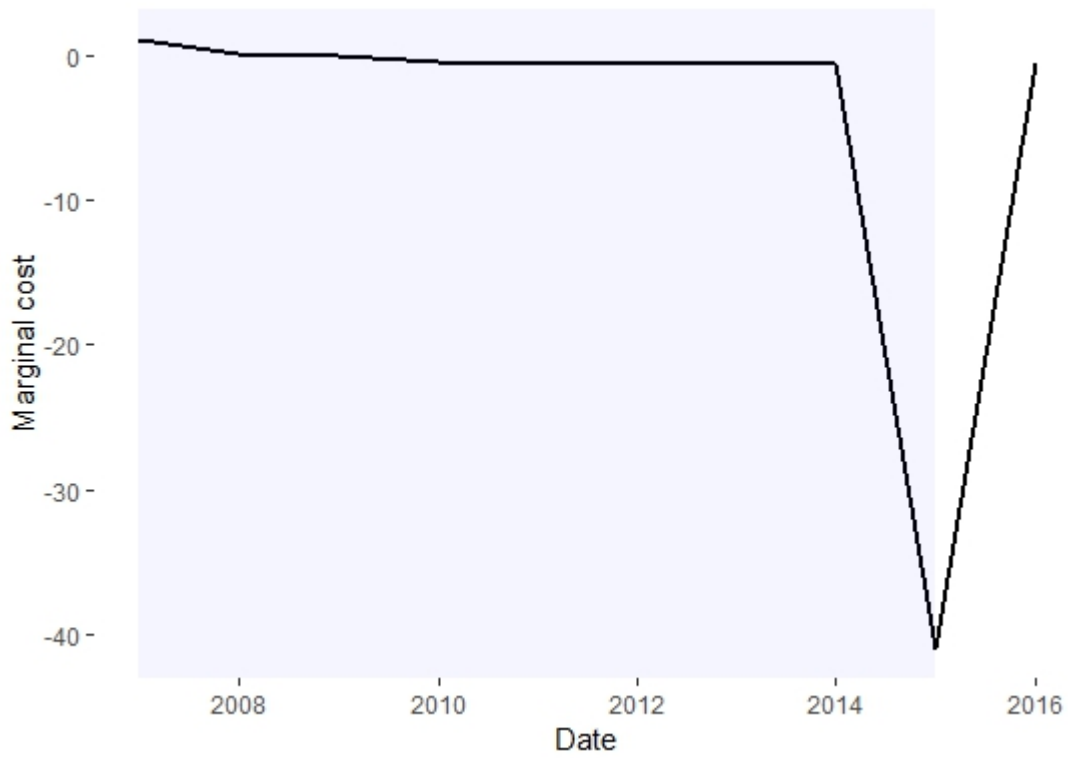Figure 1: Boone indicator for the five banks between 2006 and 2016

Source: author's calculations based on data from Bloomberg Professional Services.

Figure 2: Accumulated market share growth

Source: author's calculations based on data from Bloomberg Professional Services.

Figure 3: Marginal costs for the five banks between 2006 and 2016

Source: author's calculations based on data from Bloomberg Professional Services.

When compared with other measures commonly employed in the banking literature, the Boone indicator has two clear advantages. First, we are able to describe how competition has evolved over time. There are clearly periods when competition is strong, and other periods when it is not. Given appropriate diagnostic testing (not included in this study), it is conceivable that changes in competitiveness might carefully be ascribed to various events. In South Africa, meaningful events include the passing of the National Credit Act, and the global financial crisis. Reference to the literature, however, gives us a clue about the evolution of the Boone indicator (and competition) between 2006 and 2016. According to Clerides et al. (2015), efficiency (and competition) increases during the upward phase of the business cycle. This claim is partly confirmed by data showing that the South African business cycle experienced a 50-month upward phase between 2009 and 2013. The positive impact of the National Credit Act is confirmed by Makhaya and Nhundu (2016), who report that Capitec experienced the Act as an aid to the expansion of its business.

The other clear advantage is our ability to focus on a single market. Therefore, even if the sector is monopolistically competitive as suggested in the literature, it may be only a few markets that skew this result. I would argue, upon analysing Figure 1, that the loan market in South Africa is reasonably competitive, and that the monopolistic influence stems from a different market. The savings market is a natural option, and the investigation of competition in this market may prove useful. Once again, it is necessary to stress the importance of understanding competition at a micro level. Given the complex nature of banks, targeted policy is undoubtedly required, and this kind of analysis is crucial to creating stable and competitive banking systems.

6   Policy measures to improve competition

Although the banking sector has become more competitive over time, it is yet to reach the theoretically desired level of perfect competition. According to the studies mentioned in section 1, the sector remains monopolistically competitive, highly concentrated, and unable to adequately translate gains in efficiency into market share. Along with the weak relationship between competition, efficiency, and welfare, competition dynamics in the sector seem to be influenced by exogenous factors. For instance, in theory, if banks improve their efficiency—i.e. reduce costs—they should be able to increase their competitiveness by offering lower prices. If this improvement in efficiencies is adequately transferred to consumers, consumer welfare will increase along with disposable incomes. The appropriate enabling measure in this case would be to simply encourage banks to be more efficient and subsequently pass on those efficiencies to consumers. Other things being equal, this solution would provide the desired result. However, this does not happen. There are three exogenous factors that I identify as problematic for competition: regulatory, financial, and informational barriers. I believe the impact of each of these factors can be reduced, and I provide recommendations that may help policymakers.

6.1   Overcoming regulatory barriers

Included in the list of regulatory barriers are two issues related to size and consistency. The first is the number of regulatory requirements, which induces significant due-diligence-related costs. The second is the lack of consistency across regulatory bodies, which inhibits the speedy implementation of bank-specific decisions. Since every retail bank in South Africa is subject to several statutes—which include the Banks Act, the National Credit Act, the Competition Act, the Consumer Protection Act, and the Basel requirements—these burdensome requirements might deter possible entrants. Therefore, regulations should allow an effective vetting system that still encourages entry and competition. This can be done by streamlining some of the objectives and powers of the various supervisory bodies. If the objective is to facilitate companies such as Capitec

to meaningfully compete against established participants, the consistency and certainty of regulations is also imperative (Makhaya and Nhundu 2016).

In addition to improving consistency across the different regulators, policymakers should encourage foreign entry and reduce activity restrictions. According to Claessens and Laeven (2004), fewer activity restrictions boost competition, while Barth et al. (2004) argue that greater openness to foreign entry increases stability. These views are supported by Delis (2012), who advocates liberal policies towards foreign bank involvement with domestic institutions. Rather than simply improving competition and stability, Delis (2012) believes this policy will result in an improvement in efficiency. Understandably, these recommendations should be considered with caution. Results from these studies are Eurocentric and might easily prove untranslatable to the current South African situation, for a variety of reasons. The clear message, however, is that policymakers should remain open-minded about foreign participation in the banking sector. Where foreign banks can compete more aggressively, the environment should facilitate entry, without too much concern for competition, efficiency, or stability.

6.2 Overcoming financial barriers

Notable financial barriers in the banking sector include the cost of acquiring the relevant capital to operate and of maintaining the minimum capital requirements. The capital costs represent sunk costs that go beyond the purview of policymakers, but changes to capital requirements could help banks to engage in increased profit-making activities. Potential entrants who would have been discouraged by limited profits may enter, while incumbents will use their new profits to invest in new technologies capable of competing with the entrants. While potentially beneficial for competition and efficiency in the sector, it is not clear whether capital requirement changes would have a detrimental impact on the stability of the sector. Beyond the capital requirements, policymakers ought to ensure that the fees and fines they impose are appropriate for the banks given their varied sizes and conduct. Imposing penalties at flat rates, for instance, may unduly disadvantage smaller banks with smaller reserves.

6.3 Overcoming informational barriers

Finally, informational barriers such as switching costs and interoperability need to be addressed. According to the 2015 FinScope consumer survey, only six per cent of customers surveyed switched banks in 2015, and only 43 per cent stated that they understood the differences between the banks as well as their products (FinMark 2015). This result is confirmed by Jali et al. (2008), who note that banks intentionally compete through differentiated products and complicated pricing, rather than through price competition. Consequently, customers attempting to switch banks are often unable to make a comprehensive comparison of prices in a way that meaningfully informs their decision. Incumbent banks are then able to benefit more profoundly from network effects, which are created by both the novelty of their products and the switching costs. If the banking sector is to become more competitive, policymakers will have to ensure that switching costs become negligible. To this end, in keeping with Makhaya and Nhundu (2016), I recommend instituting a process whereby consumers are not liable for fees or other charges incurred when switching bank accounts. This information should be clear to consumers, and any misconduct on the part of the banks should be closely monitored and strictly punished by SARB.

In addition to switching costs, establishing interoperability amongst banks presents another informational barrier. Since banks are required to enter into various bilateral or multilateral agreements, competition between them relies on a high degree of cooperation. Naturally, this limits the potential for the unilateral innovations that are essential for driving sector-wide efficiency and competition. In the absence of unilateral innovations, established banks also have a greater

incentive to maintain the status quo and not be innovative. Using older technologies, they can offer the same products and services while maintaining their competitive advantage along with the older technologies used to foster it. Consequently, as competition intensifies and established banks are placed under pressure to be efficient and innovative, it becomes expedient to limit cross-bank activities. Therefore, incentives should be created for laggards to keep innovating and adapting. Where banks are reluctant to adapt, the Payments Association of South Africa and SARB should strictly enforce measures aimed at deterring such behaviour in the future.

7   Impact of competition on banking sector stability

While competition generally brings with it gains in welfare for consumers, this relationship is not always as clear in the banking sector. Since the success of each bank is inextricably linked to the success of others in the sector, the failure of a single bank can debilitate the entire system and harm consumers. Therefore, policymakers have the double-edged task of trying to encourage competition in a free market while also safeguarding the success of all the banks. If a bank is considered too big to fail, SARB is required to act as the lender of last resort. It is, however, not clear how much SARB should intervene in the system in the lead-up to failure. According to the competition-fragility view, regulators might want to limit competition up to a certain point to avoid banks being debilitated by market forces. This contrasts with the competition-stability view, which suggests that regulators should not be required to intervene in response to increasing competition. Since competition has little impact on stability, banks should be encouraged to enter and compete as much as possible. These two views are discussed in turn.

7.1   Competition-fragility view

Beck (2008), for instance, notes—consistent with Peterson and Rajan (1995)—that monopolistic rents might give incumbents greater incentive to invest in relationships with a select group of borrowers. In the presence of competition, the argument is that banks avoid overinvesting in new customers at the risk of losing them to competitors later. This view is shared by Marcus (1984), Chan et al. (1986), and Keeley (1990), who believe that concentrated sectors enable banks to build larger buffers that protect them against market fragility. In these cases, banks are less likely to undertake excessively risky behaviour, since their profits are guaranteed. As competition intensifies, Allen and Gale (2001) also note that the potential for devious behaviour amongst banks might increase concomitantly. To weaken competitors, banks might refuse to provide liquidity to a peer facing a shortage and risk weakening the financial system (Allen and Gale 2001). According to Boyd and De Nicoló (2005), the level of inflation might also have an impact on the stability of the market. In periods of lower inflation, concentrated banking systems are believed to face a higher probability of failure. Once again, this would have adverse effects on the stability of the entire banking system. On a non-theoretical level, the benefit of fewer banks is that they require fewer supervision resources. Regulatory authorities have more time and resources to identify and mitigate potential risks in the banking system.

7.2   Competition-stability view

On the other hand, a highly concentrated market poses risks of its own. Since banks with monopoly power can charge high loan rates to businesses and pay lower rates of return to depositors, their actions might distort the market and reduce overall welfare (Boyd and De Nicoló 2005; Cetorelli 2001). Some of the consequences of these actions are identified as i) the destabilization of the credit market, stemming from increased risk-taking on the part of

entrepreneurs, ii) a reduction in research and development, and iii) slower capital accumulation resulting from the increasing cost of investment.

The positive relationship between competition and stability has also been researched in South Africa. Moyo (2018) finds no conclusive evidence suggesting that competition has led to greater instability in the South African banking system. Instead, Moyo (2018) finds that competition has a positive effect on efficiency. Furthermore, competition actually enhances bank soundness. This result is supported by cross-country evidence from Staikouras and Wood (2000), Schaeck et al. (2009), Beck et al. (2013), and Zigraiova and Havranek (2015).

More than providing stability, it could be argued that increased competition gives banks the ability to translate technological edge into lower costs and better services for consumers. As lower costs get translated into lower prices for consumers, the welfare of both banks and consumers should improve. In response to more affordable banking services, the large unbanked population will gain access to the banking system. At the same time, bank profits will benefit from a larger client base. Moreover, portfolios will benefit from increased diversification of their borrowers, thereby ensuring the banks are sounder.

Regardless of the view taken on the relationship between competition and stability, it has become clearer, following the global financial crisis, that minimum capital requirements and complacent supervision are not enough to protect the system. Innovation in the financial sector will continue, and regulators will need to be creative about maintaining the competition-stability balance. Furthermore, as financial technology critically reduces the cost of capital, more banks will enter the sector. Along with their improvements in efficiency, these banks will create a more complicated system containing banks interconnected in a variety of ways. Naturally, this will require regulators to increase the resources available to them for supervision. Expanding their workforces and leveraging the power of technology will be imperative.

8   Conclusion

Building on the banking competition literature in South Africa, I employ a relatively new measure of competition to the banking sector. The Boone indicator, developed by Boone (2008), shows that competition within the banking sector has generally been improving. Between 2006 and 2014 competition intensified, before reversing between 2014 and 2015. From 2015 competition seemed to return to the previous trend. Part of this improvement in competition over time is explained by the introduction of Capitec into the South African banking sector. Helped by the National Credit Act, the company has been able to establish itself in a highly concentrated sector. Another possible reason for the significant improvement in competition is given by Clerides et al. (2015). The authors note that upward phases of business cycles typically coincide, as witnessed in this study, with a period of improving competition. Despite a clear improvement in competition over time, other results suggest that gains in efficiency are not fully translated into gains in market power as expected. For instance, while FNB and Capitec remain the most efficient banks, their advantage is not fully translated into significantly greater market power. The reason for this, I argue, is that the sector remains vulnerable to exogenous factors that influence competition dynamics. The three exogenous factors that I identify are regulatory, financial, and informational barriers which allow incumbents to maintain their power. Consequently, my recommendation for policymakers trying to improve competition is for them to tackle each of these barriers individually. For instance, regulatory barriers should be tackled by consolidating the power and reach of regulators to ensure that entrants can enter the market easily. Reducing activity restrictions and allowing more foreign entry to the point that stability is maintained is another possible solution. With regard to financial

barriers, policymakers ought to make the costs and fees charged to banks more commensurate with their size. Where flat fees are imposed, the fee should not disadvantage smaller banks compared with big banks. Finally, to tackle informational barriers, I suggest eliminating switching costs. It is equally important to ensure that interoperability between banks is maintained and encouraged. Incumbent banks should be forced to continually innovate and stay abreast of the technological innovations that might be introduced by entrants. Finally, I recommend consideration of the possible impact of increased competition on bank stability. My view is that the biggest strain on stability will come in the form of supervisory resources. If regulators are not able to monitor market participants effectively, there will be another opportunity for financial innovations to weaken the system. Therefore, a necessary step for policymakers will be to proactively equip their workforce with the skills and knowledge to monitor financial technology developments. Clearly, there remains an opportunity to increase the competitiveness and stability of the banking system; the commitment towards achieving this is the prerogative of the stakeholders involved.

References

Allen, F., and D. Gale (2001). *Comparing Financial Systems*. Cambridge, MA: MIT Press.

Bain, J. (1951). 'Relation of Profit Rate to Industry Concentration: American Manufacturing 1936–1940'. *Quarterly Journal of Economics*, 65(3): 293–324.

Barth, J., G. Caprio, and R. Levine (2004). 'Bank Regulation and Supervision: What Works Best?' *Journal of Financial Intermediation*, 13(2): 205–48.

Beck, T. (2008). 'Bank Competition and Financial Stability: Friends or Foes?' Washington, DC: World Bank, Development Research Group.

Beck, T., O. De Jonghe, and G. Schepens (2013). 'Bank Competition and Stability: Cross-Country Heterogeneity'. *Journal of Financial Intermediation*, 22(2): 218–44.

Berger, A., and T. Hannan (1989). 'The Price-Concentration Relationship in Banking'. *Review of Economics and Statistics*, 71(2): 291–99.

Bikker, J., and K. Haaf (2002). 'Measures of Competition and Concentration in the Banking Industry: A Review of the Literature'. *Journal of Banking and Finance*, 26(11): 2191–214.

Bikker, J., and M. van Leuvensteijn (2008). 'Competition and Efficiency in the Dutch Life Insurance Industry'. *Applied Economics*, 40(16): 2063–84.

Bikker, J., S. Shaffer, and L. Spierdijk (2012). 'Assessing Competition with the Panzar-Rosse Model: The Role of Scale, Costs, and Equilibrium'. *Review of Economics and Statistics*, 94(4): 1025–44.

Boone, J. (2004). 'A New Way to Measure Competition'. Discussion Paper 4330. London: CEPR

Boone, J. (2008). 'A New Way to Measure Competition'. *Economic Journal*, 118: 1245–61.

Boyd, J., and G. De Nicoló (2005). 'The Theory of Bank Risk Taking and Competition Revisited'. *Journal of Finance*, 60(3): 1329–43.

Cetorelli, N. (2001). 'Competition Among Banks: Good or Bad?' *Economic Perspectives*, 25(2): 38–48.

Chan, Y., S. Greenbaum, and A. Thakor (1986). 'Information Reusability, Competition and Bank Asset Quality'. *Journal of Banking and Finance*, 10(2): 243–53.

Claessens, S., and L. Laeven (2004). 'What Drives Bank Competition? Some International Evidence'. *Journal of Money, Credit, and Banking*, 36(3b): 563–83.

Claessens, S., and L. Laeven (2005). 'Financial Dependence, Banking Sector Competition, and Economic Growth'. *Journal of the European Economic Association*, 3(1): 179–207.

Clerides, S., M. Delis, and S. Kokas (2015). 'A New Data Set on Competition in National Banking Markets'. *Financial Markets, Institutions and Instruments*, 24(2-3): 267–311.

Delis, M.D. (2012). 'Bank Competition, Financial Reform, and Institutions: The Importance of Being Developed'. *Journal of Development Economics*, 97: 450–65.

Demsetz, H. (1973). 'Industry Structure, Market Rivalry, and Public Policy'. *Journal of Law and Economics*, 16(1): 1–9.

Falkena, H., G. Davel, P. Hawkins, D. Llewellyn, C. Luus, E. Masilela, G. Parr, J. Pienaar, and H. Shaw (2004). 'Competition in South African Banking: Task Group Report'. Pretoria: National Treasury and SARB.

FinMark (2015). 'FinScope South Africa 2015'. Johannesburg: FinMark. Available at: www.finmark.org.za/wp-content/uploads/2015/11/PRES_FSSA2015_Consumersurvey _Launch.pdf (accessed 11 January 2019).

Flamini, V., L. Schumacher, and C. McDonald (2009). 'The Determinants of Commercial Bank Profitability in Sub-Saharan Africa'. Working Paper 09/15. Washington, DC: IMF.

Jali, T., H. Nyasulu, O. Bodibe, and R. Petersen (2008). 'Banking Enquiry'. Pretoria: Competition Commission of South Africa.

Kasekende, L., K. Mlambo, V. Murinde, and T. Zhao (2009). 'Restructuring for Competitiveness: The Financial Services Sector in Africa's Four Largest Economies'. In World Economic Forum, World Bank, and African Development Bank (eds), *African Competitiveness Report 2009*. Geneva: World Economic Forum.

Keeley, M. (1990). 'Deposit Insurance, Risk and Market Power in Banking'. *American Economic Review*, 80: 1183–200.

Makhaya, T., and N. Nhundu (2016). 'Competition, Barriers to Entry and Inclusive Growth in Retail Banking: Capitec Case Study'. *African Journal of Information and Communication*, 17: 111–37.

Marcus, A. (1984). 'Deregulation and Bank Financial Policy'. *Journal of Banking and Finance*, 8(4): 557–65.

Mason, E. (1939). 'Price and Production Policies of Large-Scale Enterprise'. *American Economic Review*, 29(1): 61–74.

Mirzaei, A., and T. Moore (2014). 'What are the Driving Forces of Bank Competition Across Different Income Groups of Countries?' *Journal of International Financial Markets, Institutions and Money*, 32: 38–71.

Mlambo, K., and M. Ncube (2011). 'Competition and Efficiency in the Banking Sector in South Africa'. *African Development Review*, 23(1): 4–15.

Moyo, B. (2018). 'An Analysis of Competition, Efficiency and Soundness in the South African Banking Sector'. *South African Journal of Economic and Management Sciences*, 21(1): a2291.

Okeahalam, C. (2001). 'Structure and Conduct in the Commercial Banking Sector of South Africa'. Available at: www.tips.org.za/files/499.pdf (accessed 14 December 2018).

Peltzman, S. (1977). 'The Gains and Losses from Industrial Concentration'. *Journal of Law and Economics*, 20: 229–63.

Petersen, M., and R. Rajan (1995). 'The Effect of Credit Market Competition on Lending Relationships'. *Quarterly Journal of Economics*, 110(2): 407–43.

Schaeck, K., M. Cihak, and S. Wolfe (2009). 'Are Competitive Banking Systems More Stable?' *Journal of Money, Credit and Banking*, 41(4): 711–34.

Simatele, M. (2015). 'Market Structure and Competition in the South African Banking Sector'. *Procedia Economics and Finance*, 30: 825–35.

Simbanegavi, W., J. Greenberg, and T. Gwatidzo (2014). 'Testing for Competition in the South African Banking Sector'. *Journal of African Economies*, 24(3): 303–24.

Staikouras, C., and G. Wood (2000). 'Competition and Banking Stability in the Euro Area: The Cases of Greece and Spain'. *Journal of International Banking Regulation*, 2: 7–24.

van Leuvensteijn, M., J. Bikker, A. van Rixtel, and C. Sørensen (2011). 'A New Approach to Measuring Competition in the Loan Markets of the Euro Area'. *Applied Economics*, 43(23): 3155–67.

Verhoef, G. (2009). 'Concentration and Competition: The Changing Landscape of the Banking Sector in South Africa 1970–2007'. *South African Journal of Economic History*, 24(2): 157–97.

Zigraiova, D., and T. Havranek (2015). 'Bank Competition and Financial Stability: Much Ado About Nothing?' *Journal of Economic Surveys*, 30(5): 944–81.