3

The Role of the State in Promoting Bank Competition

- *Competition in the banking sector promotes efficiency and financial inclusion, without necessarily undermining financial stability.*

- *Even if the recent crisis is perceived as an episode where competition exacerbated private risk taking and helped destabilize the system, the correct public policy is not to restrict competition. What is needed is a regulatory framework that ensures that private incentives are aligned with public interest.*

- *The state can play a role in enhancing banking competition by designing policies that guarantee market contestability through healthy entry of well-capitalized institutions and timely exit of insolvent ones and by creating a market-friendly informational and institutional framework.*

- *Governments should be mindful of the consequences of their intervention during crises and limit negative consequences on bank competition and risk taking.*

The recent crisis reignited the interest of policy makers and academics in assessing bank competition and rethinking the role of the state in shaping competition policies (that is, policies and laws that affect the extent to which banks compete).[1,2] Some believe that increases in competition and financial innovation in markets such as subprime lending contributed to the recent financial turmoil. Others worry that the crisis and government support of the largest banks increased banking concentration, reducing competition and access to finance, and potentially contributing

to future instability as a result of moral hazard problems associated with too-big-to-fail institutions. Box 3.1 presents a recent debate on the relationship between competition and financial stability.

Another reason why competition matters is related to the changing mandate of central banks and bank regulatory agencies. Although traditionally the primary goal of bank regulators has been to ensure bank stability, this is changing. According to the World Bank's Bank Regulation and Supervision Survey, updated in 2011, 71 percent of

In a recent debate held by *The Economist* magazine, two banking professors expressed contrasting views about the role of bank competition in promoting stability.

According to Franklin Allen, Nippon Life Professor of Finance and Economics, Wharton School, University of Pennsylvania, "more competition does make banking more dangerous." But he also cautions that "competition is only one of the factors contributing to instability." He goes on to say that "the experience of a number of countries in the past and during the recent crisis provides some insights into the relevant issues. Historically, the comparison that has often been made is between the stability of the Canadian banking system compared to the United States' experience. In the late 19th and early 20th century, the United States had many banking crises, while Canada did not. The standard explanation for this is that Canada had a few large banks, while the United States had many small banks. In the recent crisis, the banking system in Canada and also that in Australia were very resilient. Six banks dominate the Canadian financial system, while there are four major banks together with a few small domestic banks in Australia. However, the United Kingdom, whose banking system has a broadly similar structure to Australia's, with four major banks and a few other small domestic and foreign banks, had a very different experience. The lesson of this comparison is that competition is only one of the many factors that are important. In addition to the competitive nature of the industry, funding structure and the institutional and regulatory environments are important. These factors are well illustrated by the recent experience of Canada, Australia, and the United Kingdom. Canadian and Australian banks mainly relied on depositary funding. This funding source proved stable through the crisis. In contrast, British banks increasingly used wholesale funding from financial markets. Canada and Australia also have much more conservative regulatory environments than the UK. For example, in Canada, capital regulation is stricter than the Basel agreements require. Banks' foreign and wholesale activities are limited. The mortgage market is also conservative in terms of the products offered, with less than 3 percent being subprime and less than 30 percent being securitized. In the UK a 'light touch' regulatory framework was implemented. An illustration is that capital ratios were weakened by banks' off balance sheet vehicles, which were used to hold securitized assets."

On the other hand, Thorsten Beck, Professor of Economics and Chairman of the European Banking Center at Tilburg University, argues that "competition in banking is not dangerous per se; it is the regulatory framework in which banks operate and which sets their risk-taking incentives that drives stability or fragility of banking. Competition can be a powerful source of useful innovation and efficiency, ultimately benefitting enterprises and households; competition can also foster stability through improved lending technologies; competition, however, can also endanger stability if mixed with the wrong kind of regulation."

"Risks and dangers in banking arise primarily from a regulatory framework that is not adapted to the market structure. Large financial institutions turn too-big-to-fail because the regulator does not have any means to properly discipline and resolve them. Similarly, competition results in herding and increased fragility risk in the absence of macro-prudential tools to counter asset price and credit booms and take into account co-variation between banks' risk profiles. The experience from the last crisis has led to reform attempts exactly in these two areas: resolution, especially of systemically important financial institutions, and macro-prudential regulation. It is thus not market structure or competition per se, that drives fragility, but a regulatory framework that sets the wrong incentives."

"The challenge is to maintain competition in the market to the benefit of the real economy, while at the same time creating a regulatory framework that minimizes the negative implications that competition can have for stability. Such a framework would include additional capital charges for size, complexity and systemic importance of banks, macro-prudential regulations that take into account the interaction between financial institutions, and—most critically—a resolution framework that allows resolving even the largest financial institutions, thus reducing the perverse incentives stemming from a too-big-to-fail status."

This discussion suggests that both sides share more in common than they disagree with, but see *Economist* 2012 http://www.economist.com/debate/days/view/706 for more.

Source: The Economist 2012 (reprinted with permission).

bank regulators report that their mandate also includes promoting financial inclusion and economic development. Also, 65 percent mention issues of market conduct, and nearly 25 percent mention competition policy. Hence, either directly or indirectly—because competition influences market conduct and access to finance—competition is an important issue for regulators.[3]

This chapter presents measures of bank competition and describes basic trends across economies and over time. By illustrating various approaches to measuring competition and discussing factors that drive it, the chapter seeks to provide guidance to policy makers.

The chapter conveys four main messages:

- Bank competition improves efficiency across banks and enhances access to financial services, while not necessarily eroding the stability of the financial system.
- Policies to address the causes of the recent crisis should not restrict competition. The correct public policy should establish a regulatory framework that supervises and ensures the alignment of private incentives with public interest.
- The state should promote competition both as a regulator and as an enabler of a market-friendly informational and institutional environment. Policies that improve market contestability—through healthy entry of well-capitalized institutions and timely exit of insolvent ones, opportune flow of adequate credit information, and contract enforceability—will enhance competition among banks.
- State interventions during crises may create barriers to exit that permit insolvent and inefficient banks to survive and generate unhealthy competition. Governments should take steps to eliminate distortions in risk taking and limit their negative consequences on bank competition.

The chapter first discusses alternative measures of competition and presents trends across economies and over time, using measures of market concentration, contestability, and bank pricing behavior. It then reviews the evidence on the implications of banking competition for bank efficiency, access to finance, and financial stability. After that, the chapter analyzes the policy drivers of competition and highlights the role of the state as a regulator and enabler of a market-friendly informational and institutional environment. It also examines the impact on competition of government actions during crises. The chapter concludes by summarizing the policy implications.

BANK COMPETITION: MEASUREMENT AND STYLIZED FACTS

There are three main approaches to assessing bank competition: measures of bank concentration under the "structure-conduct-performance" paradigm, regulatory indicators that measure the contestability of the banking sector, and direct measures of bank pricing behavior or market power based on the "new empirical industrial organization" literature.

An alternative approach used by some studies to analyze bank competition is based on interest spread decomposition (box 3.2). But spreads are outcome measures of efficiency, and in addition to the competition environment, cross-country differences in spreads can reflect macroeconomic performance, the extent of taxation on financial intermediation, the quality of the contractual and judicial environment, and bank-specific factors such as scale and risk preferences. So this chapter instead presents direct measures such as the Panzar-Rosse H-statistic, the Lerner index, and the so-called Boone indicator. Box 3.3 summarizes these measures.[4]

Competition may vary within economies and across products (for example, by type of loan, such as corporate or consumer). Ideally, competition should be measured by business line for different markets (box 3.4). But such disaggregated data are often not available, and most measures cannot be computed separately for these submarkets. Accordingly, in what follows, country and regional measures

BOX 3.2   **Decomposing Bank Spreads to Make Inferences about Bank Competition**

Bank interest spreads are frequently used as an indicator of the efficiency of the banking system (Beck and Fuchs 2004; Demirgüç-Kunt and Huizinga 1999; Demirgüç-Kunt, Laeven, and Levine 2004). An accounting decomposition of bank spreads or of interest margins (the value of a bank's net interest income divided by assets) can be derived from a straightforward accounting identity:

Before-tax profits to assets (BTP/TA) = After-tax profits to assets (ATP/TA) + taxes to assets (TA/A)

From a bank's income statement, before-tax profits must satisfy the accounting identity:

BTP/TA = NI/TA + NII/TA − OV/TA − LLP/TA

where NI is net interest income, NII refers to non-interest income, OV stands for overhead costs, and LLP refers to loan loss provisioning. The identities above allow for a decomposition of net interest margins (NI/TA) into its components:

NI/TA = ATP/TA + TA/A − NII/TA + OV/TA + LLP/TA

Demirgüç-Kunt and Huizinga (1999) and Beck and Fuchs (2004) follow the identities above to conduct an accounting decomposition and an economic analysis of the determinants of bank net interest margins using data for 80 countries between 1988–95, in the first case, and focusing on 38 banks in Kenya for the year 2002, in the second case.

To the extent that high spreads are explained by high profit margins, these studies infer that lack of competition could be a factor. In the economic analysis of spreads, Demirgüç-Kunt and Huizinga (1999) regress spreads and profits on measures of concentration (as an indicator of competition) and conclude that, aside from other factors, lack of bank competition drives bank spreads and profits across countries. Similarly, Beck and Fuchs (2004) conclude that the high profit margins that explain part of the high spreads in Kenya are due to lack of competition in the banking sector.

are used to illustrate different approaches to assessing bank competition.

The structure-conduct-performance paradigm assumes that there is a stable, causal relationship between the structure of the banking industry, firm conduct, and performance. It suggests that fewer and larger firms are more likely to engage in anticompetitive behavior. In this framework, competition is negatively related to measures of concentration, such as the share of assets held by the top three or five largest banks and the Herfindahl index.

Figure 3.1 depicts the asset share of the five largest banks (CR5) in developed and developing economies, showing that banking systems are more concentrated in developing than developed economies. Across regions, banking systems in Sub-Saharan Africa and the Gulf Cooperation Council (GCC) countries of the Middle East and North Africa

region have the largest CR5 concentration ratios (figure 3.2).

Concentration measures are not good predictors of competition.[5] The predictive accuracy of concentration measures on banking competition is challenged by the concept of market contestability. The behavior of banks in contestable markets is determined by threat of entry and exit. Banks are pressured to behave competitively in an industry with low entry restrictions on new banks and easy exit conditions for unprofitable institutions—even if the market is concentrated.

Figure 3.3 depicts two (admittedly imperfect) proxies of regulatory indicators that capture entry conditions into the banking industry: an index of barriers to entry and the share of banking licenses denied. These two indicators are from the World Bank's Bank Regulation and Supervision Survey, and they capture entry restrictions into the

BOX 3.3   Measuring Banking Sector Concentration and Competition

Banking concentration can be approximated by the concentration ratio—the share of assets held by the *k* largest banks (typically three or five) in a given economy—or the Herfindahl-Hirschman index (HHI), the sum of the squared market share of each bank in the system. The HHI accounts for the market share of all banks in the system and assigns a larger weight to the biggest banks. Instead, concentration ratios completely ignore the smaller banks in the system. The concentration ratio varies between nearly 0 and 100. The HHI has values up to 10,000. If there is only a single bank that has 100 percent of the market share, the HHI would be 10,000. If there were a large number of market participants with each bank having a market share of almost 0 percent, the HHI would be close to zero.

The Panzar and Rosse (1982, 1987) H-statistic captures the elasticity of bank interest revenues to input prices. The H-statistic is calculated in two steps:

1. Running a regression of the log of gross total revenues (or the log of interest revenues) on log measures of banks' input prices.
2. Adding the estimated coefficients for each input price. Input prices include the price of deposits (commonly measured as the ratio of interest expenses to total deposits), the price of personnel (as captured by the ratio of personnel expenses to assets), and the price of equipment and fixed capital (approximated by the ratio of other operating and administrative expenses to total assets).

Higher values of the H-statistic are associated with more competitive banking systems. Under a monopoly, an increase in input prices results in a rise in marginal costs, a fall in output, and a decline in revenues (because the demand curve is downward sloping), leading to an H-statistic less than or equal to 0. Under perfect competition, an increase in input prices raises both marginal costs and total revenues by the same amount (since the demand curve is perfectly elastic); hence, the H-statistic will equal 1.

A frequently used measure of markups in banking is the Lerner index, defined as the difference between output prices and marginal costs (relative to prices). Prices are calculated as total bank revenue over assets, whereas marginal costs are obtained from an estimated translog cost function with respect to output. Higher values of the Lerner index signal less bank competition.

The Boone indicator measures the effect of efficiency on performance in terms of profits. It is calculated as the elasticity of profits to marginal costs. To calculate this elasticity, the log of a measure of profits (such as return on assets) is regressed against a log measure of marginal costs. The elasticity is captured by the coefficient on log marginal costs, which are typically calculated from the first derivative of a translog cost function. The main idea of the Boone indicator is that more-efficient banks achieve higher profits. The more negative the Boone indicator is, the higher the level of competition is in the market, because the effect of reallocation is stronger.

banking industry. The first indicator, an overall index of barriers to entry, summarizes the information needed to obtain a banking license. Higher index values indicate more stringent requirements for bank entry. The second indicator of contestability is the share of applications for bank licenses that were denied. Regulations concerning entry to the banking sector are, on average, more stringent in developing economies than in developed ones. Between 2001 and 2010, the share of denied banking licenses declined for both groups of countries.

The competitive environment of the banking system can also be affected by the strategic reactions of banks. The new empirical industrial organization literature provides three indicators of banks' pricing behavior.[6]

First, the H-statistic measures the elasticity of banks' revenues relative to input prices (Panzar and Rosse 1982, 1987). Under perfect competition, an increase in input prices raises both marginal costs and total revenues by the same amount, and hence the H-statistic equals 1. Under a monopoly, an increase

FIGURE 3.1   **Five Bank Concentration Ratio (CR5): Developed and Developing Economies**

Median asset share of 5 largest banks, %
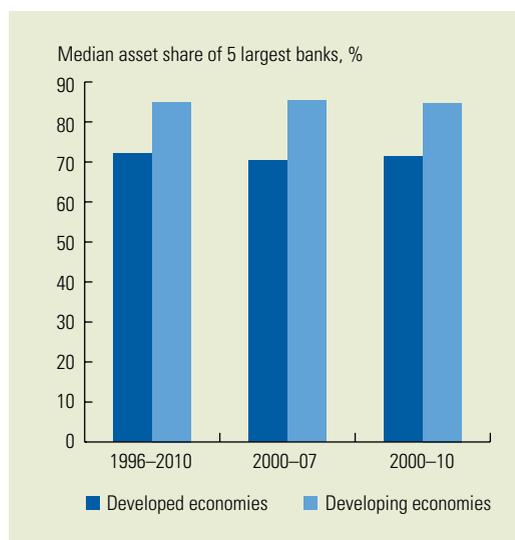
Source: Calculations based on Bankscope (database).

in input prices results in a rise in marginal costs, a fall in output, and a decline in revenues, leading to an H-statistic less than or equal to 0. Panzar and Rosse (1987) show that when H is between 0 and 1, the system operates under monopolistic competition. In general, the H-statistic is interpreted as a measure of the degree of competition in the banking market.[7]

Second, the Lerner index captures the difference between output prices and marginal costs of production—that is, the markup of output prices over marginal costs (Lerner 1934).[8]

Finally, the Boone indicator is based on the association between firm performance and efficiency (Boone 2001; Boone, Griffith, and Harrison 2005; Hay and Liu 1997). See box 3.3 for further details on the calculation

FIGURE 3.2   **Five Bank Concentration Ratio (CR5): Developing Regions, Median Values, 1996–2010**
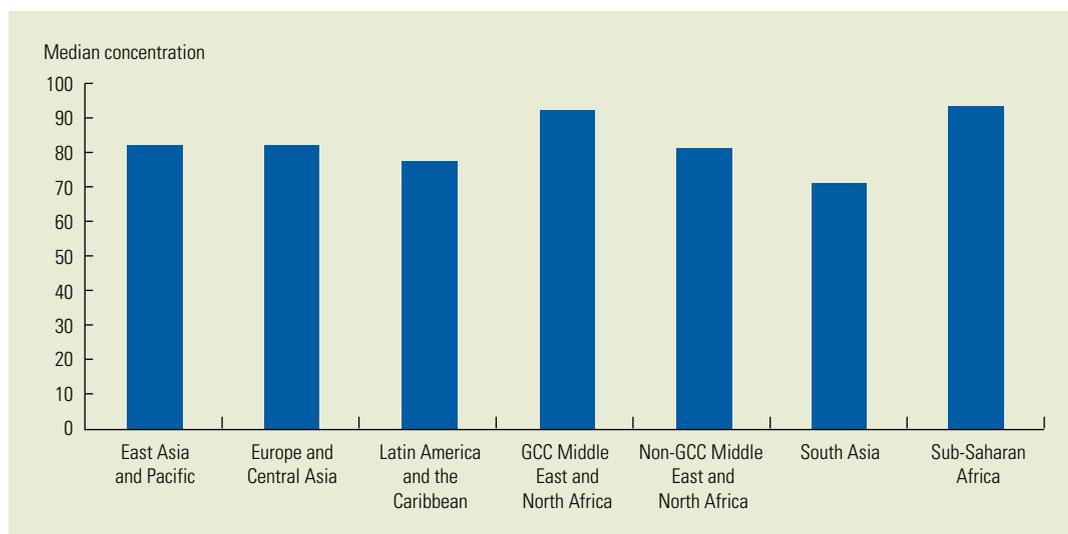
Source: Calculations based on Bankscope (database).

of these pricing indicators of banking competition.

Figure 3.4 depicts the H-statistic for developed and developing economies. Bank pricing behavior was more sensitive to changes in the price of inputs among developed compared with developing economies in 1996–2007, indicating that banking systems in developed economies behave more competitively. But bank competition declined in 2008–10 for developed economies, while it improved for developing economies. It can be argued that the declining trend in developed economies may be attributed to the implications on industry structure and competitive conduct of the recent systemic banking crisis and its associated large-scale policy responses.

Figure 3.5 examines the competitive behavior of banking systems across developing regions. Latin America has the systems with the highest sensitivity of output to input prices, whereas those in the Middle East and North Africa appear to be the least competitive (see box 3.5 for further details).

Figure 3.6 shows the evolution of the Lerner index, a measure of market power that compares output pricing and marginal costs (that is, markup), as well as the Boone indicator, a measure of the effect of efficiency on performance in terms of profits. An increase in the Lerner index or the Boone indicator indicates a deterioration of the competitive conduct of financial intermediaries. Banking competition in developed economies deteriorated initially (1996–2003), increased in the run-up to the global financial crisis (2004–08), and worsened afterward (2009–10). The initial deterioration could be associated with the drop in competition observed in the euro area after the adoption of the European Monetary Union (Sun 2011) and in line with findings of less competitive behavior of banks in large and integrated financial markets (Bikker and Spierdijk 2008).[9]

It is important to note that the simple observation that competition increased before the crisis does not necessarily suggest that greater competition in itself spurred the crisis. Recent studies suggest the problem was that the increase in competition occurred in an environment where regulation and supervision were too lax and incentives for adequate risk management were missing (Barth, Caprio, and Levine 2012; Caprio, Demirgüç-Kunt, and Kane 2010).

On the other hand, the financial crisis—and the subsequent policy responses by

FIGURE 3.3   Regulatory Indicators of Market Contestability

**a. Entry barriers:
Developed versus developing economies**

Average of region

**b. Share of denied licenses:
Developed versus developing economies**

Average of region, %

c. Entry barriers across developing regions

Average of region

d. Share of denied licenses across developing regions

Average of region, %
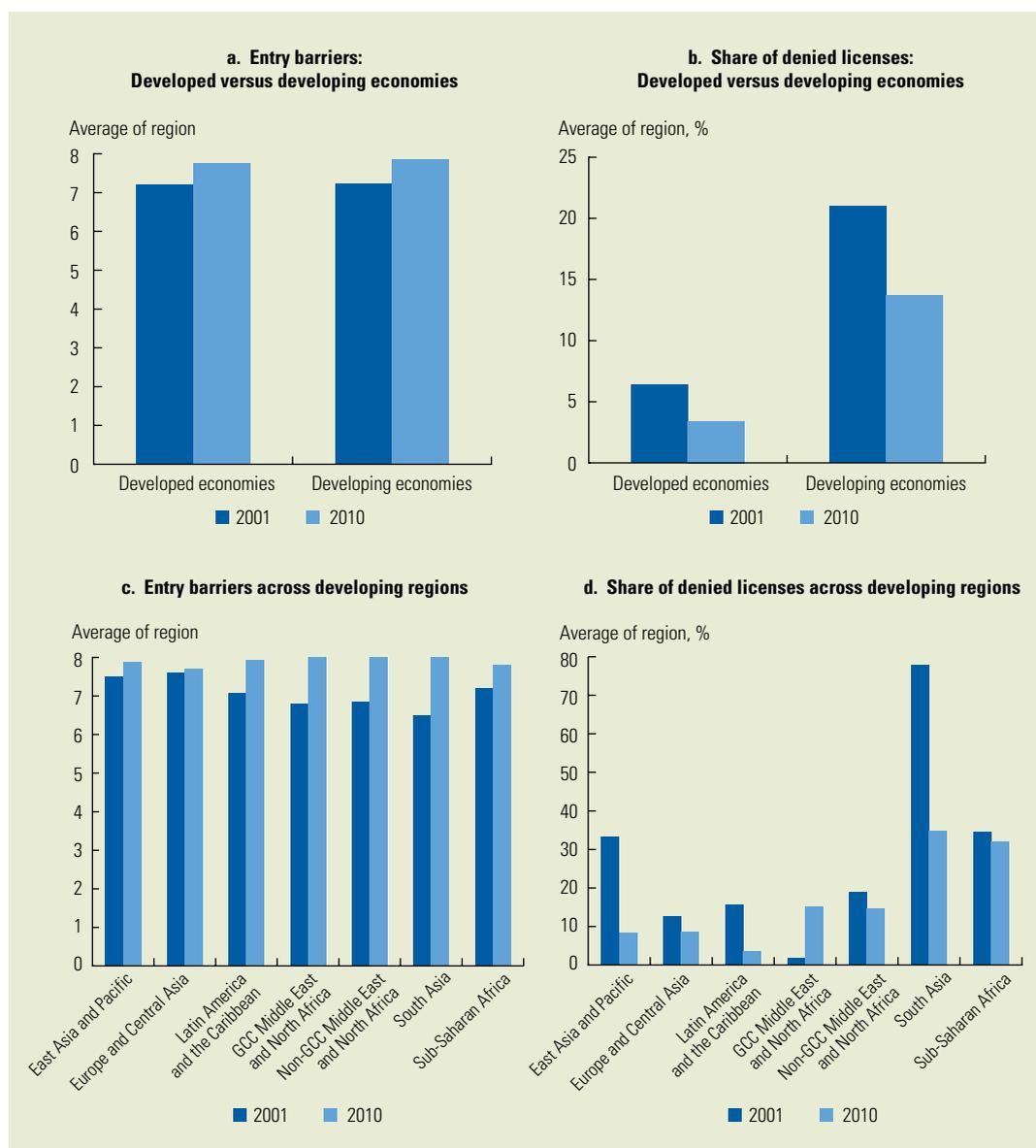
Sources: Calculations based on Bank Regulation and Supervision Survey (database), World Bank, 2007 data; Barth, Caprio, and Levine 2001, 2004, 2006; Čihák and others 2012.
Note: The index of entry into banking requirements captures whether various types of legal submissions are required to obtain a banking license. Higher scores indicate greater restrictions on entry into banking. On the other hand, the share of denied licenses is the ratio of denied to total license requests.

governments—may have affected the competitive conduct of financial intermediaries in developed economies.[10] Sun (2011) finds that bank competition in developed economies deteriorated during this period, especially in countries that had large credit and housing booms (such as the United States and Spain). The Lerner index and the Boone indicator for developing economies evolve in a similar fashion, with a smoother trend in the Boone indicator than the Lerner index. Deterioration of bank competition may have taken place in spite of financial reforms across developing economies—especially in

FIGURE 3.4   **Bank Competition: Developed vs. Developing Economies**
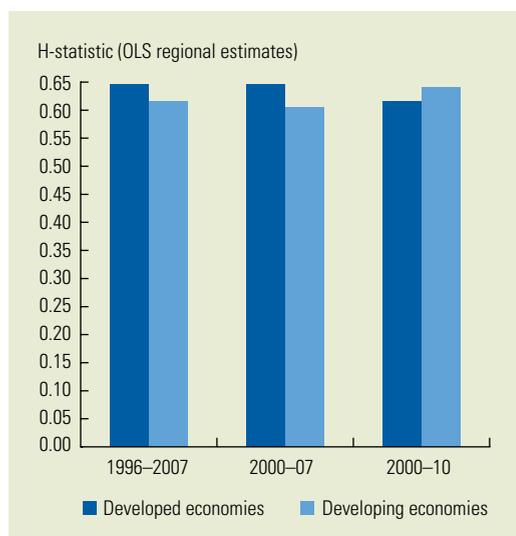
Source: World Bank staff, based on Bankscope (database).
Note: OLS = ordinary least squares.

countries with weak institutions (low bureaucratic quality and low transparency) and low levels of economic development (Delis 2012).

The Lerner index and Boone indicator in developing country regions mimic the average for developing economies—although with variability across geographical regions (figure 3.7). Though GCC countries in the Middle East and North Africa display the least competitive banking systems, Latin American banking systems have the most competitive systems in developing regions.

THE IMPACT OF COMPETITION ON THE BANKING SYSTEM

Competition affects the banking industry along three dimensions: efficiency, access to finance, and stability.

Competition and banking efficiency

There are two views on the direction of causality between competition and efficiency. The "quiet life" hypothesis argues that monopoly power allows banks to relax their efforts and increases their costs, predicting a positive link from competition to efficiency (Hicks 1935). Alternatively, the "efficient structure" hypothesis predicts a negative relationship between competition and efficiency, where causality runs from efficiency to competition (Demsetz 1973). According to this view, better managed, more efficient firms can secure the largest market shares,

FIGURE 3.5   **Bank Competition across Developing Regions, 1996–2007**
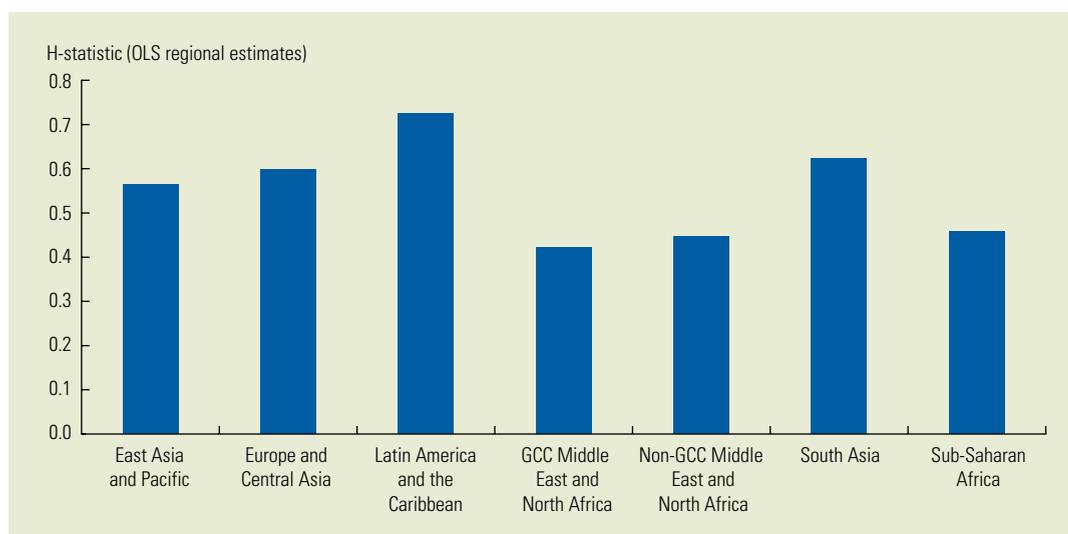
Source: Calculations based on Bankscope (database).
Note: H-statistic figures are calculated following the methodology described in Demirgüç-Kunt and Martínez Pería 2010.

BOX 3.5   Banking Competition in the Middle East and North Africa

Banking sectors in the Middle East and North Africa region (MENA) are among the deepest in the developing world (see table B3.5), but are they competitive?

Anzoategui, Martínez Pería, and Rocha (2010) analyze bank competition in the region in four different ways. First, the study analyzes two distinct measures of competition, the H-statistic and the Lerner index, over a longer period of time, 1994–2008. Second, the paper examines the behavior of competition in the region and tests for differences across two subperiods: 1994–2001 and 2002–08.

Third, the paper compares the extent of banking sector competition in the region to that observed in other regions of the developing world. Finally, the paper analyzes the factors that explain differences in competition between MENA and other regions.

The estimations of the H-statistic and the Lerner index show that banking sectors in MENA operate under monopolistic competition. Comparisons over time indicate that competition within MENA, both among Gulf Cooperation Council (GCC) countries and non-GCC economies, has not improved and, in many cases, worsened.

TABLE B3.5.1   Competition in MENA and across Regions

	H-statistics		Lerner index	
Regions	(1994–2008)	(2002–08)	(1994–2008)	(2002–08)
Middle East and North Africa	0.520	0.482	0.320	0.373
GCC countries	0.497	0.470	0.360	0.435
Non-GCC countries	0.528	0.508	0.241	0.258
p-value GCC = non-GCC	0.640	0.640	0.050	0.010
East Asia and Pacific	0.614	0.584	0.230	0.265
p-value East Asia and Pacific = GCC	0.070	0.120	0	0
p-value East Asia and Pacific = non-GCC	0.020	0.140	0.810	0.890
Eastern Europe	0.685	0.694	0.182	0.196
p-value Eastern Europe = GCC	0	0	0	0
p-value Eastern Europe = non-GCC	0	0	0.240	0.240
Latin America and the Caribbean	0.743	0.765	0.215	0.234
p-value Latin America and the Caribbean = GCC	0	0	0	0
p-value Latin America and the Caribbean = non-GCC	0	0	0.580	0.630
Former Soviet Union	0.659	0.669	0.271	0.266
p-value Former Soviet Union = GCC	0.010	0	0	0
p-value Former Soviet Union = non-GCC	0	0	0.520	0.860
South Asia	0.710	0.677	0.244	0.272
p-value South Asia = GCC	0	0.010	0.020	0
p-value South Asia = non-GCC	0	0	0.970	0.800
Sub-Saharan Africa	0.521	0.518	0.223	0.169
p-value Sub-Saharan Africa = GCC	0.700	0.510	0.040	0.020
p-value Sub-Saharan Africa = non-GCC	0.830	0.850	0.810	0.450

Note: GCC = Gulf Cooperation Council, MENA = Middle East and North Africa.

Relative to other regions, MENA is lagging behind in terms of bank competition. The evaluation of the factors explaining differences in banking sector competition between MENA and other regions suggests that a worse credit information environment and stricter regulations and practices governing bank entry are at least partly to blame.

leading to more concentration and less competition.

Although studies that examine the link between concentration and efficiency find mixed results,[11] the overwhelming majority of recent empirical studies conclude that competition brings about improvements in efficiency in both developed and developing economies. Using data for more than 14,000 banks operating in Europe and the United States, Schaeck and Čihák (2008) find a positive effect of competition on profit and cost efficiency. Similarly, using a technique to obtain joint estimates of efficiency and market power among banks in the European Monetary Union, Delis and Tsionas (2009) find a negative relationship, which is in line with the quiet life hypothesis.

Comparable findings are obtained when the sample of economies is extended to include developing economies. Using data on net interest margins and overhead costs for over 1,400 banks in 72 developed and developing economies, Demirgüç-Kunt, Laeven, and Levine (2004) find that tighter regulations on bank entry and bank activities lead to higher costs of financial intermediation. Lin, Ma, and Song (2010) find a similar result for 2,500 banks operating in 74 economies. Finally, focusing on 60 developing economies, Turk-Ariss (2010) finds a significant negative association between bank market power (as measured by the Lerner index) and cost efficiency.[12]

Overall, the literature examining the link between direct measures of competition and efficiency suggests that more bank competition increases bank efficiency in both developed and developing economies.

Competition and access to finance

Theory makes ambiguous predictions regarding the effect of competition on access to finance. The conventional market power hypothesis argues that competition in the banking market reduces the cost of finance and increases the availability of credit. On the other hand, the information hypothesis posits that in the presence of information

FIGURE 3.6   **Bank Competition: Developed vs. Developing Economies**
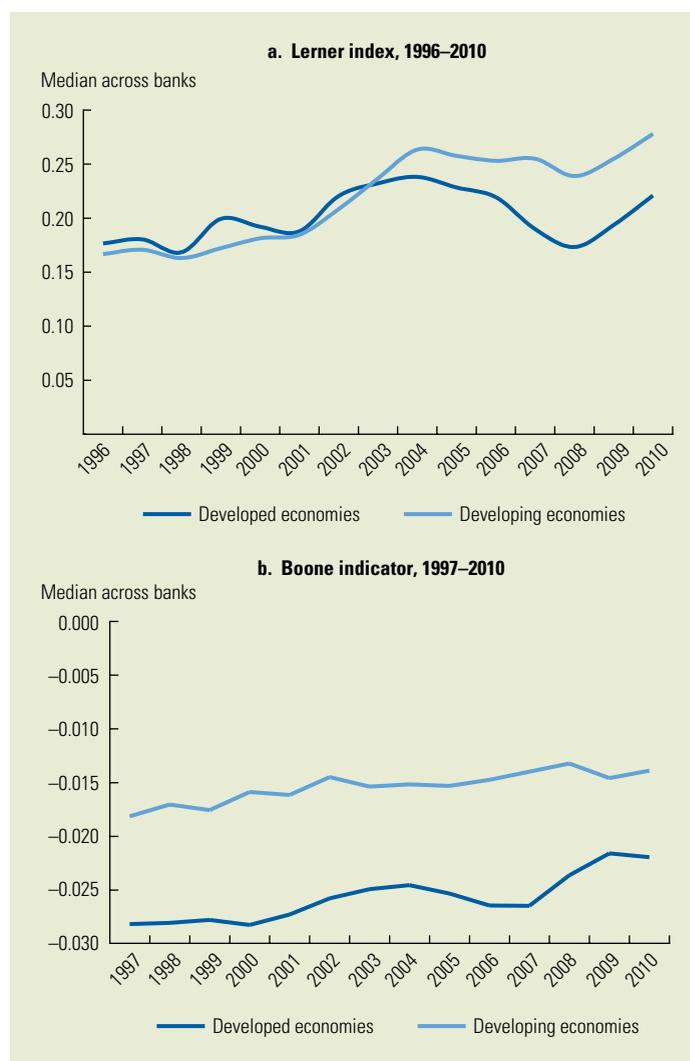
Source: Calculations based on Bankscope (database).
Note: Lerner index estimations follow the methodology described in Demirgüç-Kunt and Martínez Pería (2010). The regional estimates for the Lerner index are based on the median of bank estimates within the region. Boone indicator estimations follow the methodology used by Schaeck and Čihák (2010a) with a modification to use marginal costs instead of average costs. Data are pooled by region in order to estimate the regional Boone indicator. Boone indicator data are not shown for Sub-Saharan Africa because of a lack of adequate data

asymmetries and agency costs, competition can reduce access by making it more difficult for banks to internalize the returns from investing in lending, in particular, with opaque clients.[13]

Most of the empirical studies on this question used concentration as a measure

FIGURE 3.7   **Bank Competition across Developing Regions**

a. **Lerner index, 1996–2010**

b. **Boone indicator, 1997–2010**

East Asia and Pacific
Europe and Central Asia
Latin America and the Caribbean
GCC Middle East and North Africa
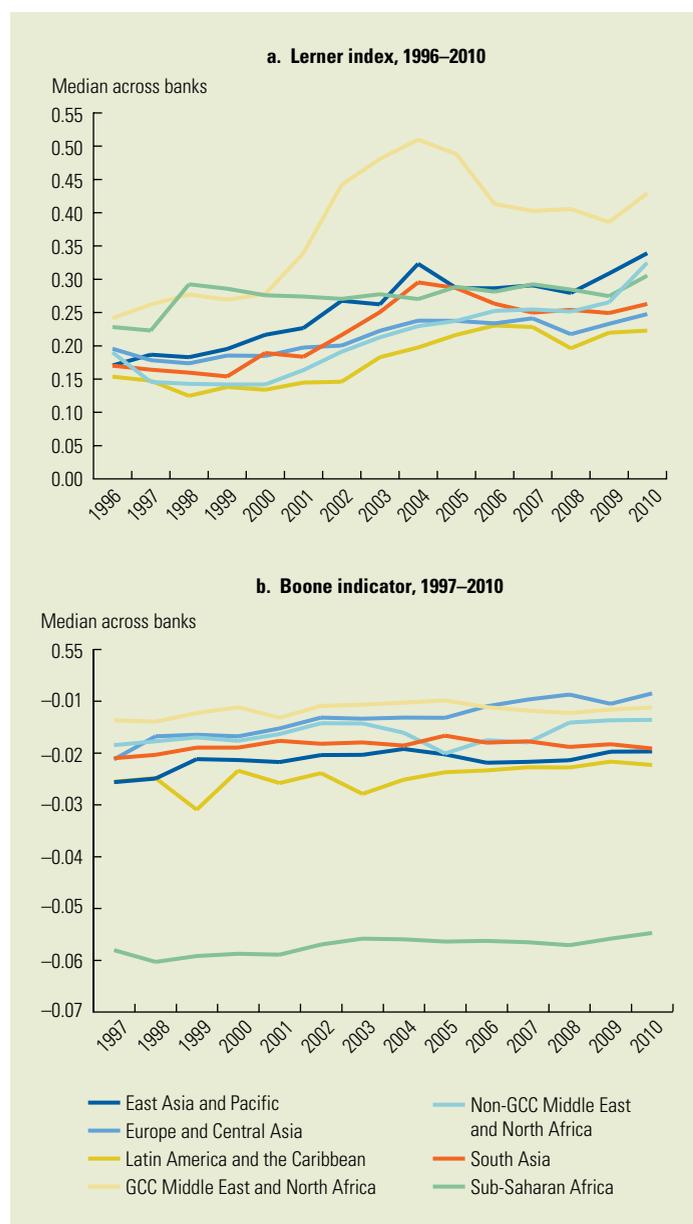Non-GCC Middle East and North Africa
South Asia
Sub-Saharan Africa

Source: Calculations based on Bankscope (database).
Note: Lerner index estimations follow the methodology described in Demirgüç-Kunt and Martínez Pería (2010). The regional estimates for the Lerner index are based on the median of bank estimates within the region. Boone indicator estimations follow the methodology used by Schaeck and Čihák (2010a) with a modification to use marginal costs instead of average costs. Data are pooled by region in order to estimate the regional Boone indicator. Boone indicator data are not shown for Sub-Saharan Africa because of a lack of adequate data.

of competition, obtaining mixed results.[14] But studies that focus on direct measures of competition and contestability show that access to finance is easier in more competitive

banking sectors.[15] Using data on growth in value added from 1980–90 for 16 countries, and measuring competition at the country-level (using the Panzar and Rosse H-statistic), Claessens and Laeven (2005) find that competition is positively associated with industrial growth. They suggest that competitive banking sectors are better at providing financing to financially dependent firms.

Exploiting a rich dataset on small and medium-sized enterprises in Spain, Carbó-Valverde, Rodríguez-Fernández, and Udell (2009) also find evidence that competition promotes access to finance, using the Lerner index.[16] In sum, similar to the findings on the link between competition and efficiency, the evidence that measures bank competition directly suggests that competition is beneficial for the banking sector. In particular, bank competition enhances access to credit.

Competition and banking stability

Competing theories explain the link between competition and stability.[17] The traditional view predicts that competitive banking systems are less stable because competition reduces bank profits and erodes the charter value of banks, consequently increasing incentives for excessive risk taking (Chan, Greenbaum, and Thakor 1986; Keeley 1990; Marcus 1984). Furthermore, in more competitive environments, banks earn lower informational rents from their relationship with borrowers, reducing their incentives to properly screen borrowers, again increasing the risk of fragility (Allen and Gale 2000, 2004; Boot and Greenbaum 1993). Competition can also destabilize the banking sector through its impact on the interbank market and the payments system.

For example, if all banks are price-takers in a competitive market, banks have no incentives to provide liquidity to a troubled bank, leading to bank failure, and creating negative repercussions for the entire sector (Allen and Gale 2000). A somewhat different argument in support of the competition-fragility view is that more concentrated banking systems have larger banks, which in turn allow them to diversify their portfolios better. A final

argument refers to the number of banks to be supervised. Given that a more concentrated banking system typically implies a smaller number of banks, this might reduce the supervisory burden and enhance the overall stability of the banking system.

The competition-stability view argues that market power in banking boosts profits and stability, yet ignores the potential impact of market power on borrower behavior (Boyd and de Nicoló 2005). Because banks in less competitive sectors can charge higher interest rates, this may induce firms to assume greater risk—resulting in a higher probability that loans become nonperforming. Similarly, higher interest rates might attract riskier borrowers through the adverse selection effect. Thus, in contrast to the charter-value hypothesis, the competition-stability view predicts that bank actions will result in more risk taking and greater fragility in more concentrated and less competitive banking systems. Advocates of the competition-stability view also disagree with the notion that concentrated banking systems are easier to monitor than less concentrated banking systems with many banks, since larger banks can be more complex and, hence, harder to supervise.

The early empirical literature on the link between competition and stability is mixed. Some country studies have shown that increasing competition leads to greater individual bank risk taking.[18] In the context of the U.S. subprime crisis, Dell'Ariccia, Igan, and Laeven (2012) document that the rapid growth of credit in U.S. mortgage markets in the run-up to the crisis was accompanied by a reduction in lending standards (lower loan application denial rates), which they argue was in part explained by the entry of new and large lending institutions. However, some previous studies failed to find that larger banks are less likely to fail as would be predicted by the competition-fragility view (Boyd and Graham 1991, 1996; Boyd and Runkle 1993; De Nicoló 2000).

On the other hand, studies using cross-country, time-series data sets offer evidence supporting the competition-stability view. Beck, Demirgüç-Kunt, and Levine (2006,

2007a) find that more competitive banking systems (defined as those with fewer regulatory restrictions on bank entry and activities) are less likely to suffer systemic banking distress. This finding is confirmed by Schaeck, Čihák, and Wolfe (2009), who find a negative relationship between bank competition and systemic bank fragility using the H-statistic to measure competition. Schaeck and Čihák (2010b) identify bank capitalization as one of the channels through which competition fosters stability. Using data for more than 2,600 European banks, they show that banks have higher capital ratios in more competitive environments. This is consistent with Berger, Klapper, and Turk-Ariss (2009), who find that banks in more competitive banking systems take greater lending risks, but compensate with a higher capital-asset ratio, resulting in an overall lower level of bank risk, as measured by the z-score.

Measures of bank risk, such as the z-score, ignore systemic stability, but regulators are concerned with systemic stability much more than the absolute level of risk of individual banks. In a recent paper, Anginer, Demirgüç-Kunt, and Zhu (2012) introduce a new measure of systemic risk taking by banks. Using Merton's 1973 contingent claim pricing framework, they calculate the default probability for each bank in the system. They measure systemic risk as the codependence in default probability across banks. After controlling for various bank- and country-level variables, Anginer, Demirgüç-Kunt, and Zhu (2012) find a positive relationship between competition and systemic stability. They also show that lack of competition (as measured by the Lerner index) has a more adverse effect on systemic stability in countries with low levels of foreign ownership, weak investor protection, generous safety nets, and weak regulation and supervision.

The advantages of competition in an efficient and inclusive financial system are significant. Recent studies provide evidence questioning the conventional view that competition is bad for stability. Importantly, policy bodies such as the OECD Competition Committee have suggested that to promote

banking stability, policy makers should design and apply better regulations and supervisory practices rather than limit bank competition (OECD 2010).

DRIVERS OF BANK COMPETITION

The main drivers of competition are entry and exit policies, underlying information and institutional environment, and competitive pressures in the financial sector.[19] The state can directly influence all three. The state can also affect bank competition by owning banks. Box 3.6 analyzes the determinants of banking competition across economies.

Entry and exit policies in banking are important for competition because they keep incumbents on their toes. The threat of entry and exit to the industry forces banks to worry about providing good, affordable products and limits their ability to exercise market power. Entry policies include regulations on licensing, as well as the practice by regulators of approving new licenses. Exit policies refer to regulations as well as the measures taken by regulators to close insolvent banks. The state can directly affect bank competition by promoting policies and practices that facilitate bank entry and exit. A delicate balance needs to be struck where regulators foster contestability (to streamline requirements for bank licensing, speed up the licensing process, and implement efficient bank resolution) without jeopardizing bank stability (that is, maintaining a licensing process that keeps out unfit bankers).

Access to credit history information about potential borrowers also facilitates competition in the banking sector. Dell'Ariccia, Friedman, and Marquez (1999) show that to the extent that access to credit information is restricted, incumbent banks are better able to exercise market power and limit competition. At the same time, greater disclosure of information regarding the terms of banking products will generate greater awareness by bank clients and promote bank competition. By promoting the establishment and operation of credit bureaus and by having in place consumer protection regulations and

practices, the state can shape the information environment and influence the extent of bank competition.

The institutional environment can also have an impact on bank competition. For example, to the extent that corruption is rampant in the economy, there will be less scope for a level playing field in the financial sector, and competition will suffer as a result. Similarly, to the degree that creditor rights are not protected, there will be less incentive for new banks to enter the banking sector. The state directly influences the institutional environment by the laws that it promotes and the extent to which it upholds compliance.

All else being equal, the entry of foreign banks and the presence of nonbank intermediaries are likely to affect bank competition. Foreign banks often bring new technologies and new products to banking sectors, creating an incentive for local banks to compete. Similarly, the presence of a liquid stock market or other financial intermediaries that can provide financing to firms is likely to foster competition in the banking sector, because banks will have to compete to provide financial services to firms. Once again, the state has a role to play here by introducing regulations and practices that foster the entry and operation of nonbank competitors.

Finally, government ownership of banks can also affect bank competition. On the one hand, government banks can spur competition if (because they typically do not maximize profits) they push other banks to lower prices. On the other hand, if government banks dominate the system and other banks are crowded out, competition falls. Box 3.6 shows that banking systems are more competitive in countries with lower entry barriers, greater foreign bank participation, and more developed capital markets (which are also associated with greater development of nonbank financial intermediaries).[20] Greater information disclosure, as captured by depth of credit information, also promotes competition. Box 3.7, on the other hand, highlights the importance of consumer protection measures to enhance banking competition.

BOX 3.6   An Econometric Analysis of Drivers of Bank Competition

The Lerner index is used as the summary measure of competition across 83 countries and is regressed against variables capturing the following:

1. Entry and exit policies in the banking sector.
2. The information and institutional environments.
3. Competitive pressures from within and outside the banking sector. Bank-level Bankscope data for the period 2000–10 are used to compute the Lerner index for all countries with at least five banks.

The first group of barriers to entry comprise measures such as the number of documents and procedures required to obtain a banking license, the percentage of denied applications for banking licenses, and the minimum entry capital required for banks. The second group includes a synthetic indicator of activity restrictions that captures a bank's ability to engage in activities other than banking (say, securities, insurance, or real estate). Higher values of this index represent greater restrictions. Both indexes are constructed with data from the World Bank 2006 Bank Regulation and Supervision Survey.

The availability of credit history information is captured by the depth of credit information index gathered from Doing Business (see http://www. doingbusiness.org). This index takes values from 0 to 6, and higher values indicate greater availability of information. The extent to which the government requires that financial institutions disclose information about financial contracts to potential users of this service is measured by an index on the strictness of financial contract disclosure requirements, which was constructed based on questions from the World Bank Regulation and Supervision Survey. This contract disclosure index is also a measure of consumer protection. The quality of the overall institutional framework is measured by the index of control of corruption, which measures the degree to which public power is exercised for private benefit—such as state capture by elites and private interests (Kaufmann, Kraay, and Mastruzzi 2009).

Competitive pressures from within and outside the banking sector are captured by indicators of market structure, presence of foreign banks, liquidity of the stock market, and importance of nonbank intermediaries such as insurance companies and pension funds. Market structure is measured by the share of assets held by the top five banks in the system. To the extent that there is some validity to the structure-conduct-performance paradigm, this variable is expected to be positive and significant. Cross-border banking as captured by the share of banking assets held by foreign banks may reflect a greater degree of market contestability. To the extent that this is the case, promoting foreign bank participation may increase competition in the industry. On the other hand, if foreign bank entry is associated with mergers and acquisitions, it might not enhance competition. Finally, a more competitive banking system may arise from greater interindustry competition. In short, the development of nonbank financial intermediaries may affect the market power of the banking sector. The relative importance of such intermediaries is approximated by the value of shares traded to gross domestic product (GDP), the value of life insurance premiums to GDP, and the share of pension fund assets to GDP.

The table below suggests that the banking sector is more competitive (the Lerner index is lower) in countries with greater contestability (lower entry barriers), greater information disclosure, better institutions, more foreign bank participation, and more liquid stock markets.

(Continued on next page)

STATE INTERVENTIONS DURING CRISES AND BANKING COMPETITION

During crises, governments, central banks, and other authorities in charge of the supervision and regulation of financial institutions introduce deposit freezes, declare bank holidays, provide blanket guarantees, inject capital, increase deposit insurance coverage limits, and extend liquidity support to banks on an unprecedented scale (Laeven and Valencia 2008, 2010). During tranquil periods, the competitive effects of rescue operations on individual banks (such as capital injections,

BOX 3.6   An Econometric Analysis of Drivers of Bank Competition   *(continued)*

TABLE B3.6.1   Cross-Country Determinants of Banking Competition[a]

Variable	[1]	[2]	[3]	[4]	[5]	[6]
State as regulator: Market contestability						
Entry barriers	0.0401*	0.0376	0.013	0.0279	0.0242	0.0537**
	[0.024]	[0.023]	[0.028]	[0.021]	[0.019]	[0.021]
Share of bank licenses denied	−0.0025	0.0229	−0.0616	−0.0132	−0.0589	
	[0.038]	[0.037]	[0.049]	[0.042]	[0.043]	
Restrictions on bank activities	−0.0074	−0.0049	−0.01	−0.0087	−0.009	
	[0.005]	[0.005]	[0.008]	[0.006]	[0.006]	
Minimum entry capital required (ln)	0.0025**	0.0022*	0.0011	0.0006	0.0005	0.0031**
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
State as enabler of market-friendly environments						
Depth of credit information					−0.0110*	−0.0130**
					[0.006]	[0.006]
Strictness of financial contract						−0.0074
disclosure requirements (0-4)						[0.010]
Control of corruption	−0.0291**	−0.0172	−0.0299*	−0.0318***	−0.0235*	−0.0193
	[0.011]	[0.013]	[0.017]	[0.011]	[0.012]	[0.015]
State as bank owner						
Government bank participation	−0.0417	−0.0793*	−0.0854	−0.044	−0.0394	−0.0734
	[0.046]	[0.044]	[0.064]	[0.047]	[0.047]	[0.048]
Competitive pressures within the banking sector and from other parts of the financial sector						
Foreign bank participation	−0.0594**	−0.0677	−0.0614	−0.0859***	−0.0715**	−0.0822**
	[0.028]	[0.034]	[0.050]	[0.029]	[0.030]	[0.034]
Concentration (CR5)				0.1119**	0.0816	0.0191
				[0.055]	[0.063]	[0.065]
Stock market value traded			−0.0371*	−0.0616**		
(ratio to GDP)			[0.020]	[0.023]		
Life insurance premium			0.3105			
(ratio to GDP)			[0.445]			
Pension fund assets				0.0448		
(ratio to GDP)				[0.031]		
Constant	0.0178	0.0195	0.2706	0.0503	0.1403	−0.0858
	[0.191]	[0.189]	[0.221]	[0.176]	[0.152]	[0.158]
Observations	83	71	38	72	64	42
R-squared	0.189	0.231	0.369	0.273	0.355	0.399

Note: GDP = gross domestic product.
a. A country's Lerner index is the median estimate across banks over the period 2000–10. Robust standard errors are in brackets.
***$p < 0.01$ **$p < 0.05$ *$p < 0.1$

emergency liquidity facilities, and assisted mergers) tend to be relevant only for a limited number of distressed institutions and their competitors (Gropp and others 2011; Hakenes and Schnabel 2010). However, episodes of systemic banking crises frequently result in large-scale, repeated policy responses that affect large numbers of institutions, with potential implications for industry structure and competitive conduct in financial systems over longer periods of time.

An emerging body of research examines the effects of bank bailouts and other policy responses on risk taking at the bank

BOX 3.7   Consumer Protection and Competition in South Africa

Among emerging markets, South Africa has a well-developed financial sector and one of the largest capital markets. In 2010, the outreach of the banking sector, as measured by its credit to the private sector, totaled 145 percent of GDP, while stock market capitalization to GDP amounted to 278 percent of GDP. In recent years, major South African banks have also expanded throughout the region—notably, Absa and Standard Bank (Beck and others 2011). However, the banking sector is heavily concentrated, with the five largest banks accounting for over 90 percent of total assets and deposits in the system in 2010. Estimates of market power in the South African banking industry show that there is evidence of monopolistic competition (Greenberg and Simbanegavi 2009; Mlambo and Ncube 2011), which is consistent with the fact that large banks tend to avoid competition among themselves, as reported by the Competition Commission on Banking (OECD 2008).

The lack of competition in the South African banking sector has been documented in several reports prepared for the National Treasury and the South African Reserve Bank (Falkena and others 2004; Competition Commission of South Africa 2006). As manifested by high prices and poor quality of financial services, low rates of innovation, and financial exclusion, the lack of competition was attributed partly to high concentration and profitability in retail banking and payments (OECD 2010). This led to the Banking Enquiry launched by the Competition Commission in August 2006. The result of this inquiry led to several recommendations to address problems of restrictive interbank arrangements and barriers to entry in the payments systems, but the inquiry put special emphasis on measures of consumer protection.

Advances in consumer protection are justified on the grounds that they can promote competition and depth. Providing better information to customers can lead to rising price and product competition among banking intermediaries. In this context, South Africa established a series of mechanisms and institutions that promoted a more sound information environment. The National Credit Act 34 (enacted in 2005), for instance, provides a general framework to promote responsible lending practices, protect South African consumers from unfair credit and credit marketing practices and, more generally, establish norms and standards on consumer credit. It also created the National Credit Regulator to ensure the law's compliance, investigate complaints, promote financial literacy, and provide a knowledge platform on credit practices. On the other hand, cases of noncompliance and appeals to decisions of the regulators were allowed to be presented and solved by the National Consumer Tribunal.

In spite of the advances on abusive lending practices, the mechanisms established by the National Credit Act to restructure consumer debt have been slow. For instance, Beck and others (2011) point out that as few as 5 percent of the 150,000 applications made by overly indebted consumers have been finalized by courts. Finally, better use of consumer protection networks requires financially aware consumers. Efforts to raise the effectiveness of financial literacy programs are required.

Sources: Beck and others 2011; Greenberg and Simbanegavi 2009; Mlambo and Ncube 2011; OECD 2010.

level (Berger and others 2010; Duchin and Sosyura 2011; Farhi and Tirole 2012; Gropp, Hakenes, and Schnabel 2011; Hakenes and Schnabel 2010; Hoshi and Kashyap 2010; Richardson and Troost 2009). However, how these actions affect competition has received less attention. This issue is of vital importance because of the unintended (and possibly detrimental) effects for consumer welfare. For example, guarantees can result in entrenchment of the supported institutions; assisted mergers of large financial institutions increase concentration, presumably reducing competition in retail markets and reinforcing the perception that these banks are too big to fail (Beck and others 2010; Hakenes and Schnabel 2010).

More research is clearly needed in this area, though a number of studies suggest that state interventions that favor some bank

services (such as guarantees, liquidity support, recapitalizations, and nationalizations) force competitors to behave more aggressively, leading to decreased margins and increased competition (Gropp, Hakenes, and Schnabel 2011; Hovakimian and Kane 2000; Kane 1989). Using data for 138 countries that witnessed a variety of policy responses during 46 banking crises, Calderón and Schaeck (2012) find that Lerner indexes and net interest margins drop as a result of state interventions such as guarantees, liquidity support, recapitalizations, and nationalizations.

This apparent increase in competition should be interpreted with caution—especially if the type of state intervention under consideration delays the exit of inefficient and insolvent banks. Kane (2000) argues that some state interventions can constitute a barrier to exit by allowing these banks to survive beyond their "natural death." State support to these zombie banks—a term coined by Kane (1989)—would allow these institutions to bid up deposit rates and accept low interest rates on high-risk loans and investments, thus reducing profit margins in the industry (Kane 2000; Kane and Rice 2001). In sum, states can create zombie banks by distorting risk-taking incentives of the system and generating unhealthy competition. Calderón and Schaeck (2012) show that the increase in competition that might result from state interventions during crises is also accompanied by other negative consequences. Despite the evidence that the cost of borrowing is reduced and credit is restored as a result of these state interventions, access to credit by opaque borrowers such as small and medium enterprises is reduced.

To avoid the distorting effects of state interventions, sunset clauses and exit plans are important (Beck, Coyle, and others 2010). By providing credible signals that interventions are temporary, governments can reduce the negative repercussion for competition. Similarly, addressing governance deficiencies in the supported institutions can also be important in reducing incentives for excessive risk taking. Finally, measures such as government-sponsored mergers that reduce the

number of banks in the system can easily lead to lower levels of bank competition (OECD 2009). In that case, governments should promote the entry of deserving institutions to mitigate the negative impact of mergers.

Overall, it is clear that state interventions during crises can have an impact on bank competition and potentially on future banking stability. Governments should avoid insolvency resolution policies that not only distort risk-taking incentives and jeopardize future stability, but also have implications for the level of competition in the banking sector.

IMPLICATIONS FOR THE DESIGN OF COMPETITION POLICIES

Bank competition increases efficiency and financial inclusion. Recent evidence suggests that bank competition can even enhance systemic financial stability. Hence, bank competition should not be restricted with the hope of promoting stability. Instead, the state should design and enforce regulations that create the right incentives to safeguard stability, while at the same time promote competition and efficiency.

The state can shape bank competition through its actions as a regulator and an enabler of a market-friendly and information-rich environment. In particular, banking sectors are more competitive in economies where the state designs, implements, and enforces regulatory frameworks that ensure greater contestability. More specifically, policies designed to ease the entry of deserving institutions (those that can pass fit and proper tests) and promote timely exit may prevent incumbent banks from exercising market power and lead to a more competitive environment. Related to the less stringent barriers to entry, foreign bank penetration may also be conducive to greater competition.

The state can also promote competition in the banking sector by ensuring banks' and consumers' access to information as well as by building up a sound institutional framework that levels the playing field. Free flow of credit information among banks and transparency of financial products offered

by banks to potential consumers should be ensured by the state. A sound institutional framework that ensures the enforcement of contracts, property rights, and the rule of law that limits the exercise of public power for private benefit is conducive to greater competition in the banking sector. Finally, policies to promote deeper and more diversified financial markets—especially the development of nonbanking financial institutions—also appear to increase the level of competition in the banking sector.

Government interventions during crises that prevent the exit of insolvent institutions and increase market power through mergers can also affect competition and bank risk taking. In trying to mitigate the impact of financial crises, governments should be aware of the potentially negative consequences of their actions on bank competition and future bank stability.

Finally, implementation of competition policies depends on the institutional arrangement in place. The increased integration across different parts of the financial industry has led to a shift in financial supervision from a sector-based approach to more integrated approaches, including (a) a fully integrated supervisory model with one agency (a Financial Supervision Authority) carrying out all supervisory roles (such as microprudential, business conduct, and competition policy), or (b) a so-called functional or objective-based approach in which sectorally integrated agencies undertake different supervisory roles.[21]

An example of the latter is the twin peaks model. One agency is responsible for prudential supervision in the financial system, and another one oversees market conduct, consumer protection, and corporate governance in all sectors.[22] The effectiveness of the twin peaks approach, as argued by its advocates, is guaranteed by having a clear focus and division of roles, to minimize turf battles between agencies, as well as strong collaboration, to work together in overlapping areas (Kremers and Schoenmaker 2008, 2010). Evidence so far suggests that regulatory quality is stronger in systems with objectives-based supervision—in favor of the twin peaks model

and full integration—as opposed to different types of partial integration supervisory models.

Competition can bring important benefits to the financial sector and should not be sacrificed for the sake of stability. Instead governments should implement the measures discussed in this chapter to monitor competition and strengthen the information and institutional frameworks to promote competition, while ensuring that regulations and supervisory practices are in place that safeguard banking stability.

NOTES

1. The chapter focuses on competition in the banking sector rather than the broader financial sector. But it does touch on the impact of nonbank intermediaries on bank competition. See Motta (2004) for a broader discussion on the theory and practice of competition policy.
2. For example, in February 2010, the OECD Competition Committee held a discussion on competition, concentration, and stability in the banking sector.
3. Several developed and developing economies have competition agencies that have mandates or that can influence market outcomes in banking. Competition agencies enforce antitrust laws (for example, assess the competitive harm of mergers, deter anticompetitive behavior, and minimize distortions from state aid) and promote measures to enable firm entry and rivalry (that is, competition advocacy).
4. In general terms, the view of competition presented here and discussed in the literature is based on the notion that banks primarily compete in deposit and loan markets. However, in practice, especially in developed economies, banks offer a variety of services (such as market making, asset management, and underwriting) where market power may arise. Payment systems are another area in which there might be significant deviations from marginal cost pricing.
5. See Cetorelli (1999), Claessens and Laeven (2004), and Demirgüç-Kunt, Laeven, and Levine (2004), among others. Nevertheless, concentration measures are presented first because they are the most widely used and easiest to compute of measures of competition.

6. There is a growing literature on measuring and explaining bank competition using direct measures of competition: Anzoategui, Martínez Pería and Melecký (2010); Anzoategui, Martínez Pería, and Rocha (2010); Beck, de Jonghe, and Schepens (2011); Berger, Klapper, and Turk-Ariss (2009); and Delis (2012); Demirgüç-Kunt and Martínez Pería (2010); Schaeck and Čihák (2008, 2010a, 2010b); Schaeck, Čihák, and Wolfe (2009); Turk-Ariss (2010), among others.

7. Note that the H-statistic can only be used to test the hypothesis of perfect competition if the market is in long-run equilibrium (returns on bank assets are not related to input prices). However, tests using the H-statistic for the null of monopoly are still valid, since the long-run profit condition does not apply in the case of a monopoly.

8. Measuring marginal costs is difficult and requires certain assumptions about the cost function of banks. Typically, studies that calculate the Lerner index assume a translog cost function.

9. Bikker and Spierdijk (2008) argue that banks in large and integrated financial markets (such as in Europe after establishing the European Monetary Union) are pushed by rising capital market competition and tend to shift from traditional intermediation to more sophisticated and complex products associated with less price competition.

10. In recent work, Calderon and Schaeck (2012) use data for 138 countries, of which 43 experienced banking crises. Their analyses show that government interventions (such as blanket guarantees, liquidity support by the central bank, recapitalizations, and nationalization of banks) during crises significantly increase competition in banking systems, and the distortionary effects cannot be reversed easily.

11. See Berger (1995), Goldberg and Rai (1996), and Berger and Hannan (1998), among others.

12. One exception is Casu and Girardone (2009), who find a positive causation between market power and efficiency for 2,701 banks operating in France, Germany, Italy, Spain, and the United Kingdom from 2000 to 2005.

13. See Petersen and Rajan (1995) and Marquez (2002).

14. Using U.S. data, Petersen and Rajan (1995) and Zarutskie (2006) find that bank concen-

tration facilitates access credit, whereas Beck, Demirgüç-Kunt, and Maksimovic (2004) and Chong, Lu, and Ongena (2012) find the opposite result using data for 74 countries and for Chinese small and medium enterprises, respectively.

15. At the same time, using bank-level data, Beck, Demirgüç-Kunt, and Martínez Pería (2008) find that barriers to banking (minimum balances to open deposit accounts and to obtain loans, as well as documentation requirements to access financial services) are higher in countries with greater entry restrictions for banks.

16. At the same time, the authors find that their results for the Lerner index are not consistent with results using concentration as a measure of competition. They conclude that "researchers and policymakers need to be very careful in drawing strong conclusions about market power and credit availability based on analyses that rely exclusively on concentration as a measure of market power."

17. See Beck (2008) for a thorough review of the theoretical and empirical literature on bank competition and stability.

18. See, for example, Keeley (1990) and Dick (2006), in the case of the United States; Jimenez, Lopez, and Saurina (2007) in the case of Spain.

19. See Anzoategui, Martínez Pería, and Rocha 2010; Claessens and Laeven 2004; Delis 2012; Demirgüç-Kunt and Martínez Pería 2010.

20. Rocha, Arvai, and Farazi (2011) find that the lack of competition in the Middle East and North Africa banking sectors is the outcome of barriers to entry and lack of competition from nonbanking financial intermediaries, among other factors.

21. Čihák and Podpiera (2008) discuss the different types of supervisory arrangements.

22. Countries with a twin peaks supervisory structure are Australia (Australia Prudential Regulation Authority and the Australian Securities and Investments Commission) and the Netherlands—with the Netherlands Bank (DNB) in charge of prudential supervision and the Authority for the Financial Markets supervising market conduct (Čihák and Podpiera 2008; Kremers and Schoenmaker 2008).