Competition among banks: Good or bad?

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Introduction and summary

In recent years we have witnessed a substantial convergence of research interest and the opening of a debate on the economic role of market competition in the banking industry. The need for such a debate may seem unjustified at first. The common wisdom would hold that restraining competitive forces should unequivocally produce welfare losses. Banks with monopoly power would exercise their ability to extract rents by charging higher loan interest rates to businesses and by paying a lower rate of return to depositors. Higher lending rates would distort entrepreneurial incentives toward the undertaking of excessively risky projects, thus weakening the stability of credit markets and increasing the likelihood of systemic failure. Higher lending rates would also limit firms' investment in research and development, thus slowing down the pace of technological innovation and productivity growth. Lower supply of loanable funds, associated with higher lending rates, should also be reflected in a slower process of capital accumulation and, therefore, in a lack of convergence to the highest levels of income per capita.

These are some of the conventional effects that market power in the banking industry is commonly thought to generate. However, in more recent years, researchers have begun analyzing additional issues in the matter of bank competition, highlighting potentially negative aspects and so raising doubts regarding the overall beneficial welfare impact of bank competition on the economy. The research effort devoted to this issue has picked up noticeably, a sign that the time is ripe for an open debate regarding the costs and benefits of bank competition.[1]

The policy implications associated with this issue, related to the regulation of the market structure of the banking industry, are especially relevant. In fact, banking market structure is a traditional policy variable for the regulator. Implicitly or explicitly motivated by the desire to restrain banks' ability to extract rents, policymakers would typically recommend measures aimed at fueling competition, promoting the liberalization of financial markets and removing barriers to entry (see, for example, Vittas, 1992). In light of the most recent regulatory changes affecting the U.S. financial industry, the policy relevance for U.S. regulators is more current than ever. In 1992 intrastate branching restrictions were relaxed, followed in 1994 by the passage of the Riegle–Neal Interstate Banking and Branching Efficiency Act, which allows bank holding companies to acquire banks in any state and, as of June 1, 1997, to branch across state lines. Finally, 1999 saw the passage of the Financial Services Modernization (Gramm–Leach–Bliley) Act, allowing the operation of commercial banking, investment banking, and insurance underwriting within the same holding company. Such regulatory changes continue to have a significant impact on the market structure of the banking industry and on banks' competitive conduct. A deeper analysis of the economic role of bank competition should thus contribute to our understanding of the role of the regulator and the consequences of regulatory action and, therefore, support more effective policymaking.

The goal of this article is to summarize some of the arguments that have recently emerged and to suggest some new lines of investigation. In the next section, I describe theoretical contributions that have identified both positive and negative effects of bank competition. Subsequently, I illustrate the results of

existing empirical studies, which present mixed evidence regarding the economic role of bank competition. The main conclusion that seems to emerge from the review of the current literature is that the market structure of the banking industry and the related conduct of banking firms affect the economy in a much more complicated way than through the simple association: more market power equals higher lending rates and lower credit quantities. By combining the various research studies, I identify multiple effects of bank competition, acting along different economic dimensions, suggesting the existence of tradeoffs and leading us toward more sophisticated normative considerations associated with bank competition. For example, as I describe in detail later, there is evidence from recent work to support the conventional wisdom that a more concentrated banking industry imposes a deadweight loss in the credit market as a whole, resulting in a reduction in the total quantity of loanable funds and slower economic growth. However, the effect appears to be *heterogeneous* across industry sectors, and younger firms in industries that are heavily dependent on banks for investment funds actually seem to grow faster if they deal with a concentrated banking sector.

The final section of the article explores some additional lines of research on the economic role of bank competition. For instance, does it matter whether banks are government owned? To what extent do government-owned banks behave differently from privately owned banks? Could common ownership across different government-owned banks imply a cartel-like behavior?

A separate question is whether the role of bank competition varies depending on how restrictive is the regulatory environment of the banking sector. Banks may be or may not be allowed, for example, to own and control nonfinancial firms, or to engage in securities or insurance underwriting and selling, or real estate investments. The possibility for banks to be active in multiple markets and face competition from nonbank firms in such markets may have an impact on the role of bank competition in the economy. For example, the possibility to offer a wider array of products and services may allow banks to "capture" and retain clients even while facing intense competition in traditional banking markets.

Finally, another dimension of analysis is the exploration of the possible relationship between market power in the banking industry and that in other sectors of the economy. Does a concentration of market power in banking lead banks to extend credit to few firms, which grow in size and make their sectors concentrated, or rather does bank concentration promote the continuous entry of firms, thus contributing to lower concentration in other industries? Theoretical conjectures could be presented suggesting either effect.

I present an illustration of these separate lines of inquiry and some empirical evidence. This evidence confirms that the market structure of the banking industry and the related conduct of banking firms have an important role in maintaining a well-functioning economy and that normative action regarding bank regulation requires careful consideration.

Theoretical arguments

I begin by illustrating the most common theoretical arguments used to identify positive and negative economic effects of bank competition. In a stylized model of economic growth, Pagano (1993) showed that market power, by allowing banks to charge higher loan rates and compensate savers with lower deposit rates, does indeed reduce the equilibrium quantities of funds available for credit, hence generating a direct negative effect on the rate at which the economy can grow. Guzman (2000) confirms this negative effect of market power in a general equilibrium model of capital accumulation. He compares two identical economies, one with a monopolistic bank and the other with a competitive banking sector, and shows that the monopolistic bank produces an unequivocally depressing effect on capital accumulation for two possible reasons. If the conditions exist for credit rationing, quantities are rationed more with a monopolistic bank than within a competitive setting. Without credit rationing, monopoly power in banking is still inefficient because it leads to excessive monitoring. As Guzman argues, this is due to the fact that with monopoly power loan rates are higher, and with higher rates the likelihood of default also increases (moral hazard). Consequently, the monopolistic bank has to sustain a higher cost to monitor entrepreneurs, thus diverting resources that could otherwise be available for lending.

In perhaps the most widely cited article about this issue, Petersen and Rajan (1995) focus on the role banks play in financing new businesses. In a stylized theoretical model, the authors show that young firms with no record of past performance may actually receive more credit, and at better rates, if they are in a market where banks have monopoly power. The intuition is the following. Lenders facing a pool of risky (because yet unknown) borrowers should incorporate an appropriate premium in their lending rates to cover a likelihood of default potentially higher than that among already established entrepreneurs. Consequently, lending rates for this category of borrowers should be high and credit partially rationed. However, in such a

scenario, a bank with market power has an alternative lending strategy. It can charge "introductory" lower rates, attract more—and possibly on average better—young entrepreneurs, and establish a *lending relationship* with them, with the prospect of extracting rent (charging higher rates) in the future from those who are eventually successful. This strategy of initial "subsidization" and subsequent "participation" in successful firms' profits is feasible if the bank has market power. The bank relies on the fact that the successful firms will not be bid away by competitor banks in the future. On the other hand, in a competitive market, a bank sustaining the initial cost of offering credit at a lower rate could not count on its ability to retain the successful customers.

In a more recent paper, Shaffer (1998) points out another possible shortcoming associated with bank competition. One of banks' main functions is that of performing screening, separating prospective entrepreneurs by quality categories. Shaffer shows that the average quality of a bank's pool of borrowers declines as the number of competitors in the market increases. The intuition is based on the possibility that banks' screening technologies may not accurately report the borrowers' true characteristics. Suppose the screening model used by banks is indeed imperfect, in the sense that with a certain probability entrepreneurs of high quality can be identified as being of low quality, and vice versa. Also assume that a bank cannot distinguish between a new loan applicant and someone who has already been denied credit by another institution. As a result, rejected applicants (either of high or low quality) can continue to apply to other banks; the more banks there are in the market, the higher the likelihood that a low-quality applicant receives credit. This occurrence is known as "winner's curse": A bank that agrees to extend a loan may be "winning" the right to fund a lemon.

Also focusing on bank screening, Cao and Shi (2000) argue that, because an increase in the number of banks operating in the market exacerbates the winner's curse, the number of banks active in performing screening and competing in supplying credit would actually fall; as a result, loan rates would be higher and credit quantities smaller than in a market with fewer banks.

Dell'Ariccia (2000) explores another model of bank screening, showing that as the number of banks increases, the likelihood that banks will actually screen entrepreneurs, as opposed to lending indiscriminately, decreases. His argument is based on the observation that entrepreneurs may be averse to being screened. For instance, the screening process

may be time-consuming and in the process the firm may miss profit opportunities. Alternatively, an entrepreneur may not want to reveal the true creditworthiness of the project. In slow-growth periods or during recessions, screening may be the optimal strategy, since there is a high probability that entrepreneurs demanding credit may be of low quality and have already been rejected by other banks. However, in periods of economic expansion, when there is a higher proportion of new, untested entrepreneurs, banks competing for market share may choose to offer lending contracts involving no screening. The interesting result is that by bearing a higher risk in the upswing of the economic cycle, banks are more likely to plant the seeds for a subsequent recession.

Manove, Padilla, and Pagano (2000) observe that screening and collateralizing are substitutes from the point of view of a bank's lending strategy. A bank screens to select high-quality entrepreneurs and reduce the risk of default among low-quality ones. However, if an entrepreneur posts full collateral, then the bank may not have an incentive to screen (where screening is a costly activity) since the bank would be protected in the event of default. Consider a world with high- and low-quality entrepreneurs, where high-quality ones have a higher probability of picking a good project. Entrepreneurs know whether they are of high or low quality. In a competitive banking market, banks would offer loans only to those entrepreneurs whose projects were screened and thus recognized as successful. However, banks have to offer them credit at a rate high enough to recoup the total cost of screening (including the screening cost component of the entrepreneurs whose applications were rejected). High-quality entrepreneurs can separate themselves from the pool by offering to post collateral on their loan (low-quality entrepreneurs would not offer to post collateral, since they face a high probability of loss if their project turns out to be unsuccessful). Hence, banks would only screen low-quality borrowers and extend credit to those who were able to pick a successful project. All high-quality entrepreneurs (some of which will still be unsuccessful) would receive credit since they posted collateral and, therefore, do not constitute a risk for the bank.

What happens in a market with a monopolistic bank? According to the authors, such a bank may not have the incentive to accept collateral from high-quality entrepreneurs. This is because the monopolistic bank is able to appropriate the surplus generated by successful projects. Hence, for this bank, screening implies a higher rate of return and, therefore, may be preferred to accepting collateral. In this case, the

monopolistic bank screens all projects, thus eliminating the allocation of resources to entrepreneurs destined to fail.

Multiple effects of banking market structure

If banks' role were simply that of intermediating between supply and demand of credit, then market power in the hands of banks could only generate the conventional negative effect associated with rent extraction. However, banks fulfill other important functions—in particular their role in screening prospective entrepreneurs and in allocating capital resources to the best social uses. The studies described above share the insight that market competition may *distort* banks' incentive to perform these additional roles. A legitimate observation, therefore, is that banking market structure produces multiple effects, (and of opposite directions) on the economy. On the one hand, market power may enable banks to extract rents and distort the equilibrium of the credit market away from one where the *quantity* of funds supplied is the highest. On the other hand, market power may be necessary to allow banks to achieve an efficient allocation of funds, thus enhancing the *quality* of the pool of selected entrepreneurs.

The identification of a tradeoff between quantity of credit made available in the market and banks' role in allocating funds efficiently is an important insight that emerges from the most recent analysis of bank competition. Cetorelli (1997) and Cetorelli and Peretto (2000) identify both roles and model the tradeoff. Both papers analyze the role of banking market structure for an economy's path of capital accumulation and growth using a dynamic, general equilibrium framework. The first paper compares only two benchmark economies, one with perfect competition and the other with a monopolistic bank, while the second analyzes banks in a fully specified *Cournot* oligopoly model. The Cournot model has the nice feature that competition and monopoly are the two extremes of a continuum of market structures, wherein market power is fully captured by the number of firms if the model is symmetric, or corresponding measures of market concentration if the model is asymmetric. Cetorelli and Peretto (2000) analyze N banks competing with each other in gathering individual savings and in loaning funds to entrepreneurs. Banks have access to a screening technology that, at a cost, allows them to discriminate between high- and low-quality entrepreneurs. While the outcome of the screening test may not be observable by third parties, competitor banks can extract information about the screened entrepreneurs by simply observing whether the bank extends or denies the loan.[2] In other words, there is an informational externality that generates a free-riding problem, which weakens banks' incentives to incur the cost of screening and to carry out an information-based (efficient) lending strategy. Cetorelli and Peretto's model shows that the bank's optimal strategy entails screening entrepreneurs only with some probability, and thereby extending both "safe" (screened) and "risky" (unscreened) loans. The credit market is thus endogenously segmented: A fraction of entrepreneurs are always screened, with credit extended only to those of high quality, while the remaining proportion of entrepreneurs receive credit indiscriminately, regardless of characteristics of quality. The relative size of these two components of the credit market evolves along, and has feedback into, the path of economic development. Within this theoretical framework, two major effects of banking market structure on economic growth are identified. On the one hand, the fewer the number of banks, the smaller the total quantity of credit available to entrepreneurs, exactly as conventional wisdom suggests. On the other hand, the fewer the number of banks, the greater the incentive for banks to screen and, consequently, the larger the proportion of funds that is allocated efficiently to high-quality entrepreneurs.[3] Therefore, the number of banks governs the tradeoff between the overall size of the credit market and its efficiency. The size and efficiency of the credit market, in turn, determine the return to capital accumulation and, therefore, to saving. The main result of this model is that, because of this tradeoff, the relationship between banking market structure and steady-state income per capita may not be monotonic. In other words, the market structure that maximizes economic development is neither a monopoly nor perfect competition, but an oligopoly.

Empirical evidence

Simultaneously with the development of the theoretical debate, researchers have also begun to investigate empirically the economic role of banking market structure. As with the theoretical contributions, the empirical findings suggest that banking market structure has both positive and negative economic effects, and it is hard to establish which one ultimately dominates. For example, a few studies provide evidence of a clearly negative role of banking market power. Shaffer (1998) uses data on household income growth between 1979 and 1989 in U.S. metropolitan statistical areas (MSAs). He finds that, after controlling for other determinants of income growth, household income grows faster in MSAs with a higher number

of banks. Black and Strahan (2000) focus instead on the impact of banking market structure in fostering entrepreneurial activity. Looking at cross-industry, cross-state U.S. data, they find that the number of new firms and the number of new business incorporations are smaller in states where bank concentration is higher. Jayaratne and Strahan (1996) estimate the effect of the removal of U.S. bank branching restrictions on state income growth. The removal of such barriers should presumably enhance competition. They find that both personal income and output growth accelerated after states implemented the regulatory change. Hence, their findings suggest, indirectly, a positive effect of bank competition on economic growth.

At the same time, however, some empirical contributions have suggested a positive effect of bank concentration. For example, Petersen and Rajan (1995) analyze credit availability for a cross-section of U.S. small businesses located in markets characterized by different degrees of banking concentration. They find that firms are less credit constrained if they are in more concentrated markets. In addition, they find that younger firms pay lower loan rates in markets with higher bank concentration. Shaffer (1998), cited earlier, also finds evidence of higher loan chargeoff rates in MSAs with a higher number of banks. Collender and Shaffer (2000) report evidence that while the effect of bank concentration on household income in U.S. metropolitan areas was negative between 1973 and 1984, it was positive during the 1984–96 period. Bonaccorsi and Dell'Ariccia (2000) analyze cross-industry, cross-province Italian data and find that the rate of creation of new firms is higher in provinces with a more concentrated banking sector (an Italian province is roughly equivalent to a U.S. metropolitan statistical area). In fact, the effect is especially strong on new firms belonging to industry sectors that can be considered more informationally opaque, that is, where the technologies adopted are such that banks need to put more effort into screening and selecting entrepreneurs.

Evidence on multiple effects of banking market structure

Empirical evidence of both a positive and a negative channel through which banking market structure may affect an economy, implied by the various theoretical contributions and hinted at by the empirical evidence surveyed in the previous section, is confirmed in Cetorelli and Gambera (2001). They test the role of banking market structure using data on the growth of 36 industry sectors in 41 different countries, both developing and developed economies, expanding on the existing and well-established methodologies employed in the literature on finance and growth. The main stylized fact recognized in this literature is that a well-developed banking sector has an important, causal role in economic growth. The basic question asked in Cetorelli and Gambera is then, for a given level of development of the banking sector, what is the role of its market structure? They begin by evaluating whether countries with higher bank concentration are characterized by higher or lower growth across industry sectors. Given the opposing theoretical views described earlier, the answer to this question is not obvious. On the one hand, if bank concentration simply results in lower credit availability, then growth across industries should be slower in countries with a more concentrated banking market. On the other hand, if the market power associated with bank concentration generates positive effects, according, for example, to the relationship-lending argument of Petersen and Rajan (1995), then growth should be faster in countries with a concentrated banking sector. Cetorelli and Gambera find that bank concentration has a *negative* effect, on average, on industry growth.

However, Cetorelli and Gambera's empirical study goes beyond the analysis of this average effect of banking market structure. Using industry-specific information about the intensity with which industry sectors are dependent on external sources of finance, they perform more refined empirical tests. Rajan and Zingales (1998) constructed such an industry-specific measure of dependence, arguing that, due to idiosyncratic factors, different industry sectors are more or less in need of external sources of funding to finance capital investment. Sectors adopt different technologies, which imply different initial project scales, different gestation periods and cash harvest periods, and different reinvestment requirements. Intuitively, sectors like tobacco or leather generate large amount of funds internally that can be used for investment purposes. At the opposite extreme, sectors like computers or pharmaceuticals, characterized by uncertainty in the timing and in the rate of return of their investments, will be much more dependent on external sources of funds. Moreover, within a sector, the intensity of external financial dependence will also differ across firms of different age, with younger firms more in need than mature ones. Cetorelli and Gambera use this information to test whether banking market structure has a heterogeneous effect across industry sectors. Given the opposing theoretical views, one might argue, on the one hand, that firms in sectors especially dependent on external finance would suffer more, and therefore grow less than average, in a country with a concentrated banking sector. On the other hand, if bank concentration has positive effects, then firms in industries especially dependent on external finance

should benefit disproportionately more when faced with a concentrated banking sector. Cetorelli and Gambera's results show that industries more dependent on external finance in fact grow relatively *faster* in those countries where the banking sector is *more* concentrated. The effect is more pronounced for younger firms than for mature firms.

Cetorelli and Gambera's two main findings taken together thus confirm the existence of multiple effects of banking market structure. A more concentrated banking industry does impose a deadweight loss in the credit market as a whole, resulting in a reduction in the total quantity of loanable funds, exactly as conventional wisdom would suggest. However, the effect appears to be *heterogeneous* across industry sectors, and younger firms in industries that are heavily dependent on banks for investment funds seem to benefit from a concentrated banking sector.

New dimensions of analysis

These findings about the economic role of bank competition draw a picture regarding the normative implications for regulatory action that is much less clear than what has been suggested by conventional wisdom. In particular, it is not clear whether competition is necessarily welfare improving. Perhaps the major insight we have gained is that policy action related to bank competition needs to be coordinated across multiple dimensions. There may be more funds available in a competitive credit market, but there may also be higher rates of default and, consequently, greater waste of resources.[4] Some of these dimensions of the analysis are dependent on each other. For example, from the last section we learned that depending on the level of concentration of the banking industry, ceteris paribus, individual sectors will grow at different speeds. Therefore, banking market structure plays an important role in shaping the cross-industry size distribution within a country. Consequently, we have identified an interesting connection between regulation of the financial industry and industry planning. In addition, we find that bank concentration plays a more substantial role in growth by facilitating credit access of younger firms. To the extent that investment of younger firms is more likely to introduce innovative technologies, regulators face an unexpected tradeoff between the generally desirable effects of bank competition and the promotion of technological progress.

Government ownership

Next, I explore some additional lines of research on the economic role of bank competition. For instance, does it matter whether banks are government owned? How does government ownership affect the relationship between bank competition and industry growth discussed above? La Porta et al. (2000) have recently shown that government ownership in banking is a pervasive phenomenon observed across countries, more so in developing economies. The presumption is that public banks are less efficient and perform a poorer job in allocating capital to the best uses. The authors confirm this presumption by showing that countries where government-owned banks are more predominant are also characterized by lower rates of growth in per capita income and in productivity. In addition, these countries face slower development in financial markets. Cetorelli and Gambera (2001) test whether the degree of government ownership in banking affects the role of bank concentration in industry growth. They show that in countries with both high bank concentration and a high degree of government ownership of banks (as a proportion of total bank assets), the positive role of bank concentration on the growth of sectors highly dependent on external finance vanishes. What is left is evidence of the standard inefficiencies associated with market concentration. The positive role of bank concentration described earlier supports the argument that market power is needed for banks to be willing to efficiently screen entrepreneurs and establish lending relationships with them. The fact that no positive role for bank concentration is found in countries with high bank government ownership is consistent with the argument (see La Porta et al., 2000) that government banks are more likely to be managed to maximize *political* rather than social objectives.

Regulatory restrictions

An additional route of exploration should focus on the impact of regulatory restrictions on banks' activities. For example, in some countries banks have historically been authorized to own and control nonfinancial firms; and nonfinancial companies have been able to hold equity positions in commercial banks. In addition, banks have been able to operate in other markets through insurance underwriting and selling or through the underwriting and brokering of securities. The economic role of banking market power may be affected by the regulatory environment in which banks operate. For example, the mechanism proposed by Petersen and Rajan (1995) through which market power is needed for banks to establish lending relationships assumes that banks fund firms with traditional debt rather than equity finance. If a bank were authorized to finance via equity, the bank would participate in future profit sharing regardless of whether the firm maintains a lending relationship.

Therefore, it is possible that competitive banks allowed to provide equity finance would have the incentive to establish lending relationships. In such a world, the positive effect of bank concentration for firm growth identified in the empirical analysis described earlier may be less important.[5]

Moreover, in an environment where banks are authorized to operate in multiple markets (such as securities, real estate, and insurance), one could argue that, facing cross-market competitive pressures, banks in concentrated markets may be less able to extract rents. Therefore, in economies where banks are less restricted in their activities, the negative effects of bank market power may be of lower magnitude. This line of study is all the more relevant for the U.S. in light of the recent passage of the Financial Services Modernization Act.

Cetorelli and Gambera (2001) look at this issue, using a control variable that ranks countries according to how restrictive is the regulatory environment for banks.[6] However, they do not find significant evidence that the regulatory environment affects the role of banking market structure. More research along this line of inquiry is in order.

Bank concentration and concentration in other sectors

Does bank concentration "transmit" to other industries? In other words, does a concentrated banking sector lead to the formation of concentrated industry sectors, with fewer and larger firms? The effect on the market structure of industry sectors represents a novel dimension of analysis of the economic role of banking market structure. If the evidence in Cetorelli and Gambera suggests that bank concentration may help spur growth by favoring entry of young firms, could it still be the case that over time the concentrated banking industry leads to the emergence of concentration of ownership and control in those sectors that the banks helped to grow?

What determines industries' market structure? There is a literature in corporate finance focusing on the determinants of firms' size, in most cases the best available measure of an industry's market structure. If, all else equal, a sector is formed by a few, large firms, then that sector is relatively more concentrated, while if the same sector is formed by a relatively large number of smaller firms, then the sector is relatively unconcentrated. In a quite exhaustive work, Kumar, Rajan, and Zingales (1999) mention a large number of determinants of firm size and test their empirical significance. Evaluating industry-specific factors, the authors suggest that capital-intensive industries,

industries with higher wages, and those with higher R&D (research and development) intensity exhibit larger firms. Looking at country (market) factors that are common across industries, countries with a better judicial system and those with higher human capital have industries with larger firms.

How does banking market structure fit within the theories of industry market structure determinants? Theories of industrial organization suggest that barriers to entry shape market structure. To the extent that banking market structure affects the availability of external finance, it acts as a barrier to entry. However, whether increasing bank concentration leads to more or less concentration in industry sectors, that is, whether it imposes a higher or lower barrier to entry, is a priori ambiguous. On the one hand, one could argue, according to the empirical evidence shown above, that a more "monopolistic" bank may enhance the growth of firms in earlier stages. Later on, as the sector matures, it may favor lending to the now incumbent firms over potential new entrants, a rationale that would be consistent with Petersen and Rajan (1995). In fact, what drove their monopolistic bank to finance the young firms in the first place was the opportunity to "participate," via rent extraction, in the future stream of profits when firms became established. The entry of new firms at more mature stages, by increasing market competition, would undermine the profitability of the incumbents. Hence, the bank might have an incentive to constrain the access to credit of new firms in more mature sectors. A second, separate argument would maintain that managers of banks in concentrated markets might have very close relationships with incumbent clients (for example, through membership of client companies' boards of directors and resulting participation in their management) and might be led by strategic decisions, not necessarily related to the bank's own profit maximization, to support these incumbents at the expense of prospective entrants. Either argument, therefore, suggests that bank concentration should lead to increasing concentration in industry sectors.

On the other hand, one could also argue that banks' ultimate goal of profit maximization could lead banks to continuously favor new entrants that, endowed with higher return projects and more innovative technologies, would guarantee higher bank profits. In this case, bank concentration should preserve unconcentrated industries, not contribute to the formation of large firms with significant market power.

Cetorelli (2001) analyzes this issue, using a data set comprising 35 manufacturing industries from 17 OECD countries. He finds that the average size of

firms in sectors highly dependent on external finance is indeed *larger* in countries with a more concentrated banking industry. Following Rajan and Zingales (1998) and Cetorelli and Gambera (2001), Cetorelli (2001) exploits industry variation along the dimension of external financial dependence to establish the empirical result: Whether bank concentration has a positive or negative effect on industry concentration, the effect should be especially strong on sectors that are relatively more dependent on bank finance. Therefore, Cetorelli (2001) examines whether industry concentration in sectors highly dependent on external finance is disproportionately higher or lower in countries whose banking market is more concentrated. The study makes a more sophisticated use of sector-specific information. Since the theoretical underpinnings suggest that bank concentration may play a role in industry market structure by favoring or not favoring clients with whom the banks already have long-term relationships (industry incumbents), one would expect to see an effect in those industry sectors whose *mature* firms are more dependent on external finance. If the effect is negative, it would suggest that even in sectors where mature firms are especially dependent on external finance, banks still allow entry of new firms, thus reducing the concentration of market shares among old incumbents. If the effect is positive, this would suggest that bank concentration enhances concentration in industry sectors.

A qualitative analysis of the effect of bank concentration on firm size is presented in tables 1 and 2. Table 1 reports mean values of average firm size, calculated for the data set of 35 manufacturing sectors in the 17 countries used by Cetorelli (2001). The measure of average firm size is the ratio of total value added of sector j in country k with the total number of establishments in the same sector and the same country. "Low" and "high" dependence refers to sectors, respectively, below and above the median in the distribution of external financial dependence. Similarly, low and high bank concentration refers to countries with a level of bank concentration, respectively, below and above the median of the cross-country distribution. Therefore, the table indicates, for example, that the mean of firm size of low dependent sectors in countries with relatively low bank concentration is $24.59 million, while the mean of firm size of the same sectors in countries characterized by high bank concentration is $12.3 million.

The numbers in the table allow me to make three main observations. First, low bank concentration countries have firms of larger size across all sectors (24.59 > 12.30 and 6.75 > 5.16). This indiscriminate

	TABLE 1	
Firm size of high- and low-dependence sectors in high and low bank concentration countries		
	Low bank concentration	**High bank concentration**
	(· · · · · · *dollars in millions* · · · · · ·)	
Low external dependence	+24.59	+12.30
High external dependence	+6.75	+5.16

Notes: Low external financial dependence sectors are below the median of the external financial dependence distribution. High external financial dependence sectors are above the median of the external financial dependence distribution. Similarly, low bank concentration countries have a bank concentration measure below the median, while high concentration countries have a concentration measure above the median. The numbers in the table are mean values across sectors of average firm size for each of the four clusters.

effect of bank concentration, rather than being due to the specific functioning of the banking market, is likely to be the result of a country *fixed effect*, that is, a characteristic common across all industries in the same country that affects *both* bank concentration and firm size. In particular, bank concentration is typically inversely related to the size of a country, as proxied by total employment, total population, or total income. Larger countries, in other words, have smaller bank concentration. The numbers in the table indicate that firms are larger in larger countries.[7]

Second, low-dependence sectors have larger firms across all countries, regardless of bank concentration (24.59 > 6.75 and 12.30 > 5.16). This effect, which is confirmed by Kumar, Rajan, and Zingales (1999), is likely to be due to industry fixed effects, that is, industry-specific technological factors that carry across countries. There is not an obvious prior to explain why sectors that are more dependent on external finance should have smaller firms. One possibility is that this result may indicate the indirect effect of financial constraints on firm size, assuming that there is not a strong correlation between bank concentration and the extent of financial constraints: Harder access to sources of finance should restrict the growth of existing firms, and this should particularly affect the sectors that rely more heavily on external sources of funding.[8]

My third observation is about the specific effect of bank concentration. As I mentioned earlier, whatever the effect of bank concentration on firm size, I expect it should be especially strong in sectors that are highly dependent on external finance. Although low-dependence sectors have larger firms, notice that

in countries with lower bank concentration, firms in low-dependence sectors are about four times as large as those in high-dependence sectors $\left(\frac{24.59}{6.75} = 3.64\right)$. However, in countries characterized by high bank concentration, firms in low-dependence sectors are only 2.5 times as large $\left(\frac{12.30}{5.16} = 2.4\right)$. These numbers are consistent with the argument that bank concentration contributes to increased firm size in industry sectors that are more bank dependent, relative to less dependent sectors.

I refine the analysis based on table 1 by attempting to purge the measure of firm size by industry- and country-specific factors. First, I regress average firm size on industry and country dummy variables. The series of residuals of the regression is a "cleaner" measure of sectoral firm size. The resulting numbers indicating firm size will be either positive or negative. A positive number shows that a certain sector in a certain country has firm size in excess of what its industry and country factors would indicate. Vice versa, negative numbers indicate sectors with firm size smaller than is accounted for by industry and country factors. Table 2 reports the mean value of the residuals for sectors below and above the median in external financial dependence in countries below and above the median in bank concentration. The first two observations I made regarding table 1 do not apply here, since any industry- or country-specific effect has been flushed out. In particular, it is no longer true that firms in countries with low bank concentration are larger regardless of the level of external dependence and that firms in low-dependence sectors are larger regardless of the level of bank concentration in a country. What about the specific effect of bank concentration? Note that in a country with low bank concentration, firms in low-dependence sectors are larger. Such firms have positive residuals on average, while high-dependence sector firms in the same countries have negative residuals. However, the pattern is exactly reversed when we move to countries with high bank concentration. In other words, we might formulate the following artificial experiment: What happens to firm size across sectors if a country increases bank concentration? The firm size of the most dependent sectors (again, those most affected by banks) goes from being below average to well above average. This confirms a positive effect of bank concentration on the firm size of highly dependent sectors.

Of course, these results are only suggestive. More convincing evidence would require a full-fledged econometric analysis, taking into account possible

alternative explanations of this finding and testing for robustness. A complete investigation is found in Cetorelli (2001).

Conclusion

This article presents an overview of the latest research on the economic role of bank competition. Contrary to the received wisdom that competition in the banking industry is necessarily welfare-enhancing, recent research has identified possible channels through which bank competition may generate negative economic effects. The main conclusion from the reading of the current body of research is that neither extreme—monopoly or perfect competition—may be the most desirable market structure for the banking sector. In advocating policies affecting the degree of bank competition, the regulator faces a tradeoff. While more competition is likely to lead to a larger *quantity* of credit, more market power should increase banks' incentives to produce information on prospective borrowers, thus leading to a higher *quality* of the applicant pool. Another related lesson to learn from this intellectual debate is that, in analyzing the role of bank competition, we should not restrict the investigation to its impact on the credit market, but rather support a broader approach which takes into account the fact that specific characteristics of the banking industry, such as its market structure, also affect various dimensions of other sectors of the economy. Examples of such interactions are the heterogenous effect on the growth potential and market structure of other industry sectors. Hence, the regulation of the banking industry has potentially important effects on the conduct of firms in other industries. For example, banking market structure may affect pricing strategies and incentives to innovation in other industry sectors.

TABLE 2

Residual firm size net of industry and country fixed effects

	Low bank concentration	High bank concentration
Low external dependence	+2.69	−2.99
High external dependence	−2.47	+2.78

Notes: Low and high external financial dependence sectors and low and high bank concentration countries are as defined in table 1. The numbers in the table are mean values, calculated for each of the four clusters, of the residuals of a regression of average firm size on industry and country dummies.

NOTES

[1]The title of this article is taken from that of a conference cosponsored by The Wharton School of the University of Pennsylvania and by the Centre for Financial Studies of the Goethe University in Frankfurt, held in Frankfurt, Germany on April 7–8, 2000. The main goal of the conference, in the words of the organizers, was to develop a debate on whether bank competition should be seen as socially desirable. The conference program and papers are available on the Internet at http://fic.wharton.upenn.edu/fic/wfic/frankfurt2000.html.

[2]As recognized by Bhattacharya and Thakor (1993), "bank loans are special in that they signal quality in a way that other forms of credit do not" (p. 3).

[3]Fischer (2000) provides evidence from German data that, in more concentrated markets, banks produce more information in their lending activity.

[4]Note that in this analysis I have not even mentioned the potential effect of banking market structure on systemic risk and overall financial fragility. Hellman, Murdock, and Stiglitz (2000), for example, show theoretically that increases in competition, as determined by financial market liberalization, lower profits. Lower profits reduce banks' franchise value, and lower franchise value encourages banks to take more risk.

[5]In this respect, one can interpret market power as an implicit equity stake that the bank has in the firm it is financing.

[6]This cross-country indicator was put together by Barth, Caprio, and Levine (2000).

[7]The simple correlation between firm size and total income in the data set used in Cetorelli (2001) is +0.13 and highly significant. The correlation between bank concentration and total income is −0.73, also highly significant.

[8]But it could also work in the other direction: Financial constraints may impede entry of prospective new firms. The argument above would suggest that the first effect dominates the second one (this argument is also in Kumar, Rajan, and Zingales, 1999).

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