

Financial Market Structure and Economic Growth: A Cross-Country Perspective

Friedrich Fritzer¹

The paper contributes to understanding the impact of financial system indicators on economic growth. A particular emphasis is placed on financial structure indicators, which measure the specific organization of the financial system, namely, banking sector concentration, foreign bank penetration, government regulation and the efficiency of the banking industry – as opposed to depth indicators, which measure financial market liquidity. In this respect (1) the concentration of banks was found to have a detrimental impact on growth. However, concentration may also have indirect and positive impacts on growth depending on a country's initial stage of economic development, i.e. for comparatively more developed countries, the negative impact of concentration on long-run growth is lower. (2) Financial liquidity indicators, which work through both physical capital accumulation and total factor productivity, have a strong impact on economic growth. The catalyst role of banks appears to be particularly important in earlier phases of economic development. (3) Initial real GDP per capita, finally, determines the growth path of an economy. Low initial real GDP is positively related to the growth path of economies in terms of the "latecomer advantage." Given the detrimental effects of banking sector concentration on economic growth, a tentative policy conclusion would be that antitrust authorities should strive to maintain competitively structured markets. In order to increase competition in an environment subject to mergers, which significantly reduce the number of financial services providers, obstacles to the mobility of customers should be removed, for example by setting and enforcing transparency rules regarding products and prices for financial services.

How Does Financial Sector Concentration Affect Economic Growth?

A growing body of literature reports a positive relationship between the *size of the financial system* and economic growth. King and Levine (1993) – one of the most influential studies in this area – find a strong and statistically significant link between financial liquidity measures and growth and argue for a causal relationship that runs from financial development to growth and not vice versa. With the exception of causality issues the King and Levine proposition appears to be a generally accepted opinion.² A different strand of the literature investigates the impact of *financial market structure*

in contrast with financial market depth on economic growth. Financial development (or size) can be measured by stock market turnover or the volume of liquid liabilities provided by the financial intermediary system. Financial market structure, in comparison, is a much broader concept reflecting the specific organization of the financial system. The structure of the financial market is shaped by institutions (such as supervisory or regulatory authorities), the financial technology (such as the payment system) and the rules of the game that define how financial activity is organized (such as investor protection regulations). Given the complexity of the financial market structure, research-

¹ I acknowledge substantial help from Ernst Glatzer in the collection and preparation of the database used in the paper. Comments by Ernest Gnan, Helene Schuberth and Maria Teresa Valderrama were very helpful. Ingeborg Schuch provided editorial help. Any remaining errors remain my sole responsibility.

² The question of whether finance leads real activity or whether real activity leads finance cannot be answered in such purity. While economic growth certainly promotes the development of financial systems, it is inconceivable that financial development should not be correlated somehow with economic growth. In fact, examples for both views are readily found. The 19th century expansion of railroad tracks in the United States, which brought about the financial infrastructure capable of meeting the financing requirements, is one example of primarily demand-driven financial market development. In contrast, high-tech Silicon Valley startups were probably promoted by existing venture capital funds. The importance of venture capital for young innovative firms has been shown empirically for instance by Romain et al. (2003), who find the accumulation of venture capital to have contributed directly to economic growth for a panel of 16 OECD countries.

ers in this area have typically focused on selected aspects. For instance, La Porta et al. (1997) argue that countries with poorer investor protection and poorer law enforcement have less developed financial systems. In a more recent paper La Porta et al. (2002) provide evidence that higher government ownership of banks is associated with slower subsequent financial development and lower growth of real GDP per capita “as governments acquire control of banks in order to provide subsidies and other benefits to supporters who return the favour in the form of votes, political contribution and bribes.” Recently de Ávila (2003) and Dehejia and Lleras-Muney (2003) have been investigating the growth impact of the harmonization and liberalization of banking sector regulation for the European Union countries and the United States, respectively. They arrive at the conclusion that deregulation had a positive impact on economic growth.

This paper tries to contribute to understanding the impact of financial market structure on economic growth by investigating the growth impact of banking sector concentration, foreign bank penetration and banking sector efficiency across income groups of countries. Banking sector concentration has increased noticeably over the last ten years. Amel et al. (2002) report a wave of worldwide mergers and acquisitions (M&A) in the financial sector: M&A activity in the financial industry accelerated from 5,725 cases in the first half of the 1990s to 9,777 cases from 1996 to 2001. In this period, the M&A value rose almost fivefold (from USD 460.9 billion in the first half of the 1990s to USD 2,232.9 billion during the period from 1996 to 2001). According to the Group of Ten (2001) the main

causes of financial sector consolidation are the promise of cost savings and revenue enhancements; market forces unleashed by improvements in information technology, financial deregulation, globalization of financial and real markets; and increased shareholder pressure for financial performance. Against this background it is all the more surprising how little the impact of financial consolidation on economic growth has been explored empirically. From a cross-country perspective the present study is one of the very few considering the growth impact of banking sector concentration. Most of the studies on the growth impact of banking sector concentration are country-specific (e.g. Petersen and Rajan, 1995). At the cross-country level Cetorelli and Gambera (2001) provide evidence that concentration has a depressing impact on all industry sectors, and hence also economy-wide. This study explores the issue of concentration for a panel of 45 developed and developing countries and provides additional insight in the sense that the growth impact of banking sector concentration depends on the stage of development of an economy.

This paper also provides evidence of the relationship between banking sector consolidation, foreign bank penetration, financial sector size and long-run GDP growth. Our analysis suggests that foreign bank penetration and efficiency considerations are not sufficient to fully explain banking sector concentration. More importantly, the paper finds that the concentration of banks has a detrimental impact on economic growth and that the strength of the growth-reducing impact is more pronounced for initially less developed countries than for initially more developed economies.

History has shown that a tradeoff may exist between concentration and competition in the financial sector, as more concentration may enhance financial sector stability at the expense of the diversity and innovation of services (see Mayer, 2000). In that sense our paper provides evidence that the tradeoff between competition and investor protection (or enhanced financial stability) is biased towards investor protection. In fact, the latter observation is easily explained as bank failures usually induce political gyrations that cause depositor protection to be favored over competition.

Chapter 1 of the paper discusses the potential impact of banking sector concentration, foreign bank penetration and government regulation of the financial system. Section 2.1 provides a descriptive analysis for the development of the financial structure over a cross section of countries, while further empirical evidence on the finance – growth nexus is shown in section 2.2. Chapter 3 discusses the empirical findings and offers tentative policy recommendations.

I The Financial Market System – Growth Nexus

Financial systems enhance growth by channelling savings to their most efficient means. Financial systems potentially promote several sources of growth: capital accumulation and total factor productivity, in particular research and development and human capital accumulation. Even if a country has abundant savings, its growth can be hampered owing to the way financial activities are organized and the way firms are managed – problems that are in fact closely related. More specifically, financial systems reduce market frictions and reduce costs arising through the conclusion of

contracts and the need to enforce them. Market frictions, which increase trading costs, are the outcome of asymmetric information between investors and savers. For example, seeking the information that will reveal the creditworthiness of a debtor consumes resources. Properly functioning financial systems reduce such transaction and information costs by – among other things – diversifying risk and monitoring the allocation of financial funds. Hence, the question is how do bank concentration, foreign ownership of banks and government regulation affect the efficient working of financial markets and intermediaries?

1.1 A Priori the Direction of the Growth Impact of Banking Sector Concentration Is Unclear

What is the impact of banking sector concentration on economic growth? There is no straightforward answer to this question. Concentration results in an institutional environment shaped by large players. Large and important banks may themselves have an influence on bank regulation, taxes, foreign bank entry or the transparency and accuracy of the accounting standard.

Negative Growth Impact of Concentration

High concentration may affect growth negatively because a purely monopolistic market tends to impose welfare losses compared with the benchmark of a competitive market. As Pagano (1993) shows market power allows banks to charge higher loan rates and offer savers lower deposit rates. An increased net interest rate margin reduces the equilibrium quantity of funds available for credit and therefore also the rate at which an economy

can grow.³ Empirically it has been shown that larger net interest rate margins are a consequence of less competitive markets. For instance, Demirgüç-Kunt et al. (2003) provide evidence that regulations on bank entry, restrictions on bank activities, and regulations that restrain the freedom of banks to conduct their business boost banks' net interest margins. In turn, the function of the financial system to transfer available resources to the most efficient means is hampered. Concentration, hence, has the potential to negatively impact economic growth via its potential to fundamentally change policy as well as the regulatory and institutional environment.

Another channel through which a monopolistic banking market negatively affects economic growth was shown by Guzman (2000). Within a general equilibrium framework he concludes that large banks tend to depress capital accumulation via either credit rationing and/or excessive monitoring as relatively high loan rates induce entrepreneurs to undertake riskier projects.

Furthermore Shaffer (1998) shows that more fragmented banking markets may have a pool of less qualitative borrowers compared to a banking sector with few large banks as rejected fund seekers can take advantage of imperfect screening technologies and continue to apply to other banks so that "lemons," i.e. credit seekers with a relatively inferior creditworthiness, remain in the market.

Possible Positive Growth Effects of Concentration

At the same time, a highly concentrated banking sector may enhance growth due to its stronger resistance to financial crises as larger banks tend to spread their activities geographically. A historical example illustrates this case. Mayer (2000) reports that the small local banks which made a substantial contribution to the development of British manufacturing in the first half of the 19th century suffered a major setback in the period between 1809 to 1830 during which 311 banks went bankrupt (more than one third of British banks at that time). Triggered by the crisis, depositor protection was enhanced at the expense of competition, concentration increased and the geographic distribution of banks' operations widened considerably.⁴ Hence, regulation which promoted depositor protection led not only to increased financial stability but also fueled concentration in the banking sector. La Porta et al. (1997) provide empirical evidence that financial systems are better developed in countries with a higher degree of investor protection (depositors can also be regarded as investors). Striking the right balance between higher investor protection (implying a more concentrated market due to stricter legal requirements) and more competition, though, is a difficult task as the British example clearly shows.

Apart from its financial stability-enhancing impact, banking sector concentration may also be expected to have a positive effect on bank lend-

³ Hence the allocation of the competitive banking market would be Pareto preferred to the monopolistic banking market. Banks of course would make a lower (zero) profit in the competitive environment. However, the comparative loss banks suffer could be compensated by the gain debtors make.

⁴ In 1850, 459 banks in the United Kingdom operated on average 5 branches while in 1913, 88 banks operated on average 156 branches.

ing (provided concentration is mostly the result of cost efficiency considerations). Concentrated banking sectors may take advantage of economies of scale in the production of banking services (cost savings due to consolidating the output of different banks). As a consequence potential cost savings may lead to banks with a higher market share and a superior cost structure.⁵

Another feature of the positive growth impact of large banks was shown by Petersen and Rajan (1995). Monopolistic banks may have an incentive to pursue profitable projects which are only successful in the longer term whereas in a competitive banking market such investments would have a lower probability of getting funded. The rationale for this is that in a market with many banks, project returns are not necessarily earned by those which initially subsidize the firms. Hence, in a fragmented market there are diminished incentives to initially subsidize risky long-term projects, as firms may be bid away by competitor banks. Hence, young yet unknown firms with no track record and profitable but risky long-term projects have a higher chance of getting funded in a concentrated banking market.

1.2 Growth Impact of Foreign-Owned Banks and of Government Regulation of Banks

Governments for a long time restricted foreign ownership of banks or nonresident activity. However, recently financial sector consolidation has been gaining momentum. Wachtel (2001) argues that foreign bank pene-

tration leads to a rapid introduction of product and service innovations and the development of financial systems. Furthermore it may lead to economies of scale and scope and attract foreign direct investment. However, foreign-owned banks may also be of a disadvantage for locally operating small and medium-sized enterprises (SME). Big domestic banks operating in large markets tend to be engaged in relationship lending to SME with little or no track record. However, foreign-owned banks with far away headquarters may avoid business relationships based on soft information. In fact, Berger et al. (2003) provide empirical evidence that – in spite of the globalization of the banking industry – corporations tend to prefer local or regional banks for their service.

Concerning the impact of government ownership or government regulation of the banking sector on economic growth there are two conflicting views. The development view emphasizes positive effects on real GDP growth while the political economy view does not. According to Gerschenkron (1966) the role of the government in financing depends on the degree of industrialization (in the notions of Gerschenkron extremely backward, backward and advanced industrial stage). In an advanced stage of development, industrialization is mainly achieved via internal financing whereas a country at a moderately backward stage relies on bank financing. In extremely backward countries, though, the public authorities have to step in to jumpstart economic and financial developments. Hence, public banks have a stated policy agenda to

⁵ However, investigations on the country-specific cost curves of the banking sector (for the U.S.A. as well as Europe) could not find empirical evidence for a robust relationship between concentration and banking sector efficiency (see for instance Demirgüç-Kunt et al., 2003).

develop a specific industry, sector or region, and often lend at subsidized rates. Hellmann et al. (1996) argue that for developing countries with a poor institutional structure, governments may promote the stability of the financial system through a set of financial policies (deposit rate controls, lending rate controls, restrictions on entry). Such a financial policy set is intended to create rent opportunities for the private sector and enhances the soundness of the financial system. Yet, good intentions of governments do not always materialize. For instance, Guiso et al. (2003) argue that the main rationale behind the Italian banking law of 1936 was the objective to enhance banking sector stability through severe restrictions on competition. What the 1936 law did was in fact hamper economic performance in Italy. The authors argue that the north-south gap in Italy is a direct consequence of the 1936 banking sector regulation. Furthermore financial stability was not enhanced, as provinces with more restrictive regulations experienced a higher variability in the percentage of bad loans than provinces where the banking market was more competitive.

2 Empirical Evidence on Financial System Indicators, Growth and the Sources of Growth

2.1 How Did Financial Market Structure Develop Over Time?

The development of concentration of domestic banks (in terms of the share of assets held by the three largest intermediaries), foreign bank penetration (in terms of (a) foreign bank assets on total banking sector assets and (b) the number of banks in total banks operating in the domestic market) and two efficiency measures (overhead costs and the net interest rate margin) is described by means of descriptive statistics.

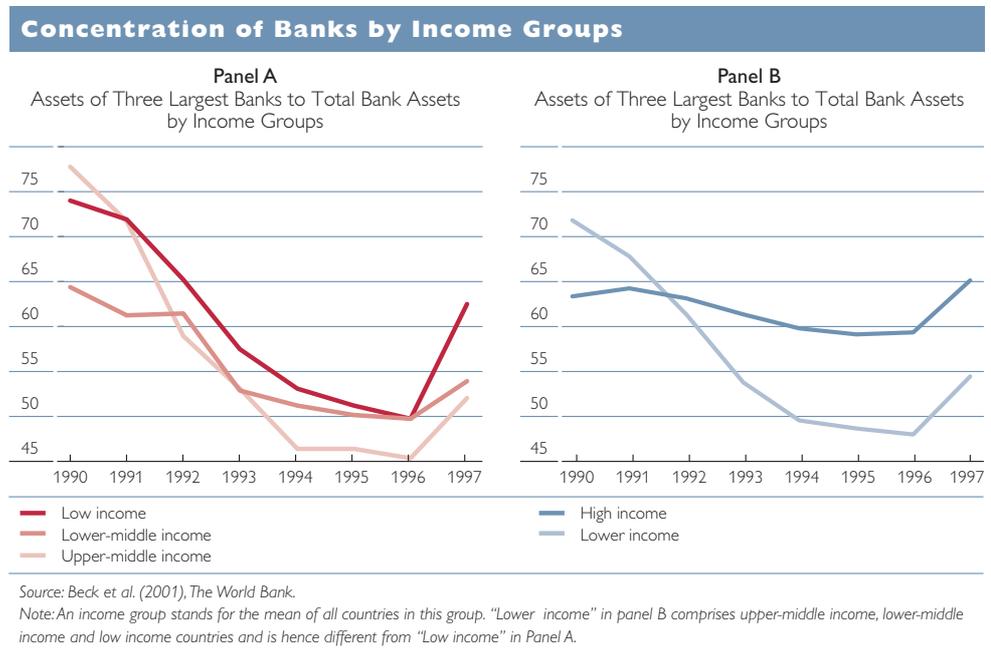
The financial market indicators used were compiled by Beck et al. (2001). For the purpose of the analysis, countries are grouped according to the 2001 World Development Indicators.⁶ Our sample comprises 22 high income, 11 upper-middle income, 10 lower-middle income and 5 low income countries.⁷ For the purpose of comparison we also pool upper-middle, lower-middle and low income countries so as to obtain two groups with approximately the same size. Furthermore we eliminate the two former socialist countries Hungary and the Czech Republic as well as China from our sample.

Concentration of banks is defined as the ratio of the three largest banks' assets to total banking sector assets.

⁶ The 2001 World Development Indicators classify economies according to the 2000 GDP per capita taking account of exchange rate fluctuations and inflation differentials via the so-called World Bank Atlas method. The World Bank income groups are: less than USD 755 (low income); USD 756 to USD 2,995 (lower-middle income); USD 2,996 to USD 9,265 (upper-middle income); above USD 9,266 (high income countries).

⁷ High income countries are Australia, Austria, Belgium, Bahrain, Canada, Denmark, Finland, France, Germany, Greece, Italy, Israel, Japan, Luxembourg, the Netherlands, Norway, Portugal, Qatar, Singapore, Spain, Switzerland and the United Kingdom. Upper-middle income countries are Argentina, Brazil, Chile, the Czech Republic, Hungary, Lebanon, Mexico, Oman, Panama, Saudi Arabia and Uruguay. Lower-middle income countries are Bolivia, China, Colombia, Ecuador, Guatemala, Jordan, Philippines, South Africa, Thailand and Turkey. Low income countries are Bangladesh, Indonesia, India, Kenya and Pakistan.

Chart 1



High concentration as well as overly fragmented banking sectors may have negative effects on efficiency and growth as well as financial stability. A highly concentrated banking sector may lead to lack of competition whereas fragmented banking markets may suffer from undercapitalized banks and are thus at a higher risk to suffer from financial market shocks.

Considering the *concentration of banks* over the cross section of countries it appears that, first, upper-middle and lower-middle income countries have a lower concentration ratio than low income countries (see panel A of chart 1). Second, high income countries record the highest concentration ratio (see panel B of chart 1). However, high income countries include both top scorers – in particular oil exporting countries (e.g. Bahrain and Qatar record an average concentration ratio of more than 90% for the time period 1990 to 1997) – and countries with the least concentrated commercial banking sectors in our sample – such as the U.S.A. and Japan

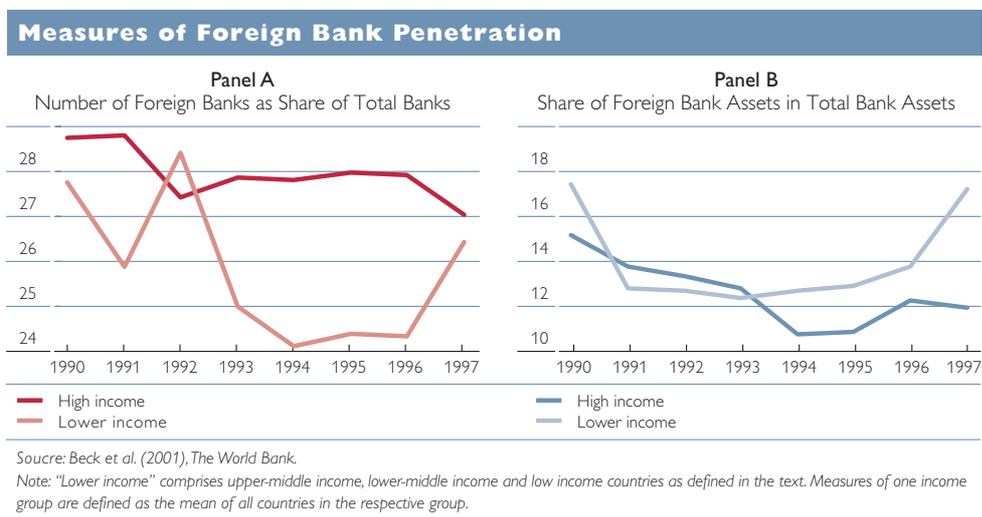
(with an average concentration ratio of about 20% during 1990 to 1997). Low income countries record a concentration ratio of more than 70% during the 1990s. While concentration ratios diverge within income groups, on average it appears that the concentration ratio decreases initially with the advancement of the economy from low to upper-middle income countries while it increases again at an advanced stage of development. This statement does not claim any established link between concentration and economic growth (statistical evidence will be given in section 2.2). However, it is interesting to note that the pattern coincides with Gerschenkron's view that in early stages of development the state takes over the function of the financial system (implying a high concentration of the financial industry) while banks (in particular banks operating locally) become important during the transition period.

The pattern of *foreign bank penetration* is much more diverse across

income groups of countries. Two measures of foreign bank penetration are investigated. First, the share of foreign banks' assets in total banking sector assets and second the number of foreign banks as a share of the total number of banks in the market. A hypothesis would be that a higher penetration by foreign banks leads to increased banking sector efficiency, i.e. lower overhead costs or a lower net interest rate margin. However, this picture does not emerge from the

data, as is evident in charts 2 and 3. Judging from the share of foreign banks in the total number of banks, higher income countries seem to have a higher foreign bank penetration (see panel A of chart 2). However, the juxtaposition of foreign assets with total banking sector assets yields the opposite relationship, i.e. lower income countries have a higher foreign bank penetration on average for the period from 1990 to 1997 (see panel B of chart 2).

Chart 2



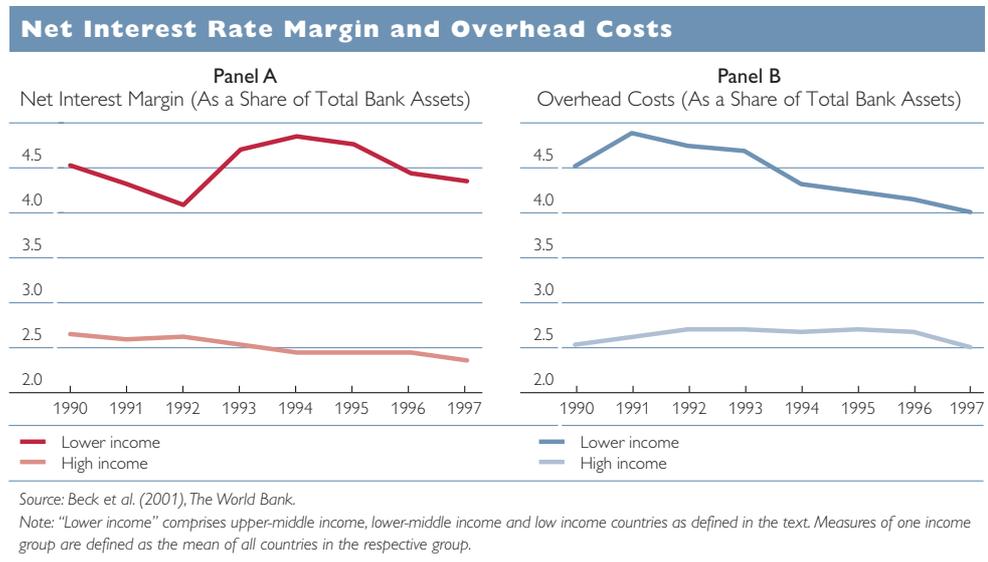
Considering individual countries, the U.S.A. and Japan record on average during the period from 1990 to 1997 the lowest share of foreign banks (less than 10% as a share of all banks) while at the other extreme high income countries like the United Kingdom record much higher proportions. For the United Kingdom the average foreign bank penetration during the observation period (in terms of foreign bank branches) is about 45% and hence similar to the measures for some low income countries.

With respect to the *public ownership* of domestic banks some authors argue that – at least in poor countries – increasing government control

of banks goes hand in hand with a negative growth impact. La Porta et al. (2002) provide evidence for this view. In their assessment low income countries are characterized by “backward financial systems, interventionist and inefficient governments, and poor protection of property rights” which is associated with “slower subsequent financial development and lower growth of per capita income and productivity.”

As proxies for *efficiency* measures we apply two indicators. First, the net interest rate margin, which measures a bank's net interest revenue as a share of its total assets and, second, overhead costs as a share of its total

Chart 3



assets. The net interest rate margin turns out to be lower in high income countries. Luxembourg and also Japan are among the high income countries with the lowest net interest rate margin as well as the lowest overhead costs. However, there are some high income countries ranking low in terms of efficiency (e.g. the U.S.A.) and some low income countries ranking high (e.g. Egypt) either in terms of the net interest rate margin or overhead costs.

Hence, it appears that banks of high income countries act more efficiently. Yet, why this is the case is not obvious from the descriptive statistics shown in charts 1 and 2 because in our sample, middle income countries on average have a more concentrated yet at the same time more efficient banking sector than low income countries. Furthermore, the hypothesis that a higher foreign bank penetration generates more efficiency does

not appear to hold when foreign bank penetration is measured as the share of foreign banks' assets in total banking sector assets.

2.2 Growth Indicators and the Sources of Growth

In the following, we investigate the relationship of four financial indicators and real GDP per capita, the growth of physical capital accumulation per capita⁸ and a residual efficiency term. Three of the financial sector indicators are financial depth variables, banking sector liquidity to GDP (specifically, deposit money banks' assets as a ratio of GDP), stock market turnover to GDP and financial institutions' liquid liabilities to GDP. As a financial structure indicator, we use the concentration of the banking market measured as the share of assets of the three largest banks in total banking sector assets.

⁸ Real GDP is taken from the Penn World Tables 6.0. Comparable capital stock data, however, are not available for the investigated country sample. We calculate capital stock data via the perpetual inventory method assuming a depreciation rate of 10% and making the assumption that capital grows at a constant rate equal to the growth rate of GDP (one of Kaldor's "stylized facts").

Real GDP growth per capita is decomposed into the growth of physical capital accumulation per capita and a residual efficiency term via the following equation $DRGDPL = DCAPITAL^\alpha \times DEFF$ with $DRGDPL$ being the growth rate of real GDP per capita, $DCAPITAL$ the growth rate of physical capital accumulation per capita and $DEFF$ the growth rate of the residual efficiency term. α is assumed to be 0.3 in our cross-country regressions. 0.3 implied a relatively good fit to the data and experimenting with other parameter values did not affect our results considerably.

Growth of real GDP per capita as well as the growth of physical capital accumulation and the residual efficiency term are regressed in turn on banking sector concentration and financial depth indicators (banking sector liquidity to GDP, stock market turnover to GDP, liquid liabilities to GDP). The conditioning information set comprises the initial real GDP per capita (real GDP per capita in 1990, i.e. the first year of the observation period), initial education of the working age population (in particular the the people aged between 15 and 65 with secondary schooling as share of the total working age population⁹) and the openness of the economy in terms of the share of exports plus imports on GDP. Conditioning information needs to be incorporated as for example relatively advanced economies have different growth prospects than developing countries. Other indicators we considered, in particular foreign bank penetration, proved not to be significant.

2.2.1 On the Whole Banking Sector Concentration Appears to Negatively Affect Economic Growth¹⁰

Financial Depth Is Significantly Correlated with Economic Growth

Our sample consists of 45 developing and developed countries. Cross-country regressions¹¹ show financial depth is strongly correlated with real GDP per capita as well as capital accumulation and residual efficiency. Financial depth indicators are also significantly and positively correlated among themselves. Stock market liquidity appears to be of less importance than banking sector liquidity. Stock market turnover is significantly correlated with the residual efficiency term only. However neither concentration of banks nor efficiency of banks shows a significant correlation with real GDP per capita or the other sources of growth.

Cross-Country Evidence Points to a Negative Growth Impact of Concentration

Cross-country regressions confirm that the financial depth measures (banking sector liquidity to GDP and stock market turnover to GDP) are significantly linked to the long-run growth of real GDP per capita. However, additionally they reveal that there is a significant and negative statistical impact of concentration on the growth of real GDP. The evidence, though, does not seem to be robust across specifications. Initial income has – as expected – a negative growth contribution. Initially rich countries

⁹ Human capital data are taken from Barro and Lee (2001). The data set comprises observations at five-year intervals from 1960 to 1999 and was linearly interpolated for our analysis.

¹⁰ Tables reporting the empirical results can be found in the appendix.

¹¹ The cross-country regressions and the correlation exercise are based on averages calculated for all variables for the 1990s.

grow on a flatter growth path than initially poor countries. The specification above – with the positive impact of financial indicators and the negative impact of initial real GDP per capita can also be interpreted as the influential “*Gerschenkron hypothesis*.” Gerschenkron (1966) argued that moderately backward countries relied particularly heavily on financial intermediation during the early phases of industrialization, while they could finance themselves more readily from internal sources in later stages of industrialization. Furthermore, backward countries were able to adopt technologies from developed nations and hence could modernize faster. At the same time, they needed institutions capable of mobilizing huge financial funds from disparate sources. Finally, the openness of the economy has a small but significant influence on long-run economic growth.

Physical Capital Accumulation Is Hampered Most by Concentration

With respect to the growth of physical capital accumulation, a much stronger and again negative impact of concentration on physical capital growth was found. The growth impact appears to be about double the size in comparison to what was found for real GDP growth per capita. Furthermore the impact is robust across different specifications. In theoretical models the depressing effect of concentration on capital accumulation works through either credit rationing or excessive monitoring of firms as entrepreneurs may have an incentive to take excessive risk where loan rates are comparatively high. Financial intermediation in terms of banking sector liquidity matters. However, no evidence for the importance of stock market liquidity was found.

Residual Macroeconomic Efficiency is Positively Linked to Stock Market Turnover

As regards the residual efficiency, i.e. growth sources not captured by physical capital accumulation, concentration did not matter. With respect to the financial depth indicators, stock market turnover was found to have positive growth impacts while initial income per capita turned out to exert a negative impact. Hence, countries with initially lower income have a higher growth potential.

In sum, the cross-country regressions reveal that (1) financial depth indicators matter for long-term growth. Measures of liquidity have a significant link to the sources of growth. With respect to the relative importance of banks and capital markets, it appears that the impact of stock markets is somewhat weaker and exerts a positive influence mainly on the residual efficiency, i.e. growth sources other than physical capital accumulation. (2) Financial structure in terms of concentration of banks matters. The influence is robust and appears to be significant for at least physical capital accumulation. Furthermore the impact is negative, i.e. increasing concentration hampers long-term economic growth prospects. (3) The initial level of economic development of a country is also important in determining its long-run growth path. Above all the starting value of real GDP per capita is linked negatively to the long-run growth path. Hence, initially rich countries grow at a slower pace than initially poor countries. While the openness of an economy positively affects growth prospects it appears to be of comparatively low (but significant) importance for the sources of growth.

The Indirect Effect of Concentration Is Positive and Depends on the Stage of Economic Development

When interaction terms are incorporated, it appears that banking sector concentration has a positive impact on real GDP growth. The higher the initial real GDP per capita is, the more favorable banking sector concentration is for growth prospects. There are forces at work which place developing nations with a comparatively concentrated banking sector at a disadvantage. Additionally liquid liabilities have a positive direct impact on real GDP growth while the indirect effect via initial real GDP per capita is negative. Hence, financial sector liquidity is particularly important in early stages of economic development. This again provides support for the Gerschenkron hypothesis which presupposes that the banking sector was crucial for countries in its early phases of industrialization. For instance, the British local banks had a pivotal role in funding manufacturing in the first half of the 19th century. As local banks were more exposed to banking crises they began to spread their activities geographically with the consequence of increasing banking sector consolidation. According to Mayer (2000) there were 459 banks in the United Kingdom in 1850. By 1920, this number had diminished drastically, with just 5 banks (Barclays, Lloyds, Midland, National Provincial and Westminster) accounting for about 80% of English bank deposits.

3 Economically More Advanced Countries Suffer Less from the Negative Growth Impacts of Banking Sector Concentration

This paper studied the link between a range of indicators of financial structure and size with long-term economic growth. A particular emphasis was placed on financial structure indicators measuring the specific organization of the financial system as opposed to depth indicators, which basically measure financial market liquidity.

The preliminary findings are:

- (1) The concentration of banks was found to have a detrimental impact on growth. However, concentration may also have indirect and positive impacts on growth, depending on a country's initial stage of economic development. For initially more developed countries, the negative impact of concentration on long-run growth is lower. This is not a counterintuitive result. For instance Petersen and Rajan (1995) have shown theoretically that in a concentrated banking sector long-term risky projects have a higher chance of getting funded. Additionally, investor protection – more likely to be established in a more developed country – provides an independent positive growth impact. In fact Gónzales (2003) provides empirical evidence that countries with stronger investor protection and a concentrated banking sector benefit from a growth-enhancing lengthening of the maturity structure of debt.
- (2) Financial liquidity indicators, which work through both physical capital accumulation and total fac-

tor productivity, have a strong impact on economic growth. The catalyst role of banks appears to be particularly important in earlier phases of economic development. The separation of the relative importance of banks and stock markets was less successful. Weak evidence could be provided that stock markets are growth enhancing mainly via total factor productivity.

- (3) Initial real GDP per capita determines the growth path of an economy. Low initial real GDP is positively related to the growth path of economies in terms of the “late-comer advantage.” The openness of the economy has a positive growth effect.

History has shown that sometimes there may be a tradeoff between con-

centration and competition in the financial sector as more concentration occasionally tends to enhance financial sector stability at the expense of the diversity and innovation of services. Hence, a tentative policy conclusion would be that financial supervisors should carefully examine the constantly changing financial systems. The goal of antitrust authorities should be to maintain competitively structured markets. In order to increase competition in an environment subject to mergers that significantly reduce the number of providers for financial services, obstacles to the mobility of customers should be removed. This could be done for example by setting and enforcing transparency rules regarding products and prices for financial services.

References

- Amel, D., C. Barnes, F. Panetta and C. Salleo. 2002.** Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence. CEIS Tor Vergata Research Paper No. 20.
- Barro, R. and J. W. Lee. 1996.** International Measures of Schooling Years and Schooling Quality. In: *American Economic Review, Papers and Proceedings* 86(2). 218–223.
- Barro, R. and J. W. Lee. 2001.** International Data on Educational Attainment: Updates and Implications. In: *Oxford Economic Papers* 53(3). July, 5415–5463.
- Beck, T., A. Demirgüç-Kunt and R. Levine. 2001.** The Financial Structure Database. In: Demirgüç-Kunt, A. and R. Levine (ed.). *Financial Structure and Economic Growth. A Cross-Country Comparison of Banks, Markets and Development*. Cambridge, Mass.: The MIT Press. 17–80.
- Beck, T., A. Demirgüç-Kunt and R. Levine. 2003.** Bank Concentration and Crises. NBER Working Paper 9921.
- Berger, A. N., Q. Dai, S. Ongena and D. C. Smith. 2003.** To what Extent Will the Banking Industry Be Globalized? A Study of Bank Nationality and Reach in 20 European Nations. In: *Journal of Banking and Finance* 27. 383–415.
- Cetorelli, N. and M. Gambera. 2001.** Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. In: *Journal of Finance* 56(2). April, 617–648.
- Dehejia, R. and A. Lleras-Muney. 2003.** Institutions, Financial Development, and Pathways of Growth. NBER Working Paper 9551.
- De Ávila, D. R. 2003.** Finance and Growth in the EU: New Evidence From the Liberalisation and Harmonisation of the Banking Industry. European Central Bank Working Paper Series No. 266.
- Demirgüç-Kunt, A., L. Laeven and R. Levine. 2003.** Regulations, Market Structure, Institutions and the Cost of Financial Intermediation. NBER Working Papers 9890.
- Demirgüç-Kunt, A. and R. Levine. 2000.** Bank Concentration: Cross-Country Evidence. Mimeo.

- Gerschenkron, A. 1966.** *Economic Backwardness in Historical Perspective: A Book of Essays*. Cambridge, Mass.: The Belknap Press. 2nd edition.
- González, N. U. 2003.** *Banking Regulation, Institutional Framework and Capital Structure: International Evidence from Industry Data*. CSEF Working Paper 111.
- Group of Ten. 2001.** *Consolidation in the Financial Sector*: BIS, IMF, OECD.
- Guiso, L., P. Sapienza and L. Zingales. 2003.** *The Cost of Banking Regulation*. Presented at the Banca d'Italia/CEPR conference. Mimeo.
- Guzman, G. M. 2000.** *The Economic Impact of Bank Structure: A Review of Recent Literature*. In: *Economic and Financial Review of the Federal Reserve Bank of Dallas*. 11–25.
- Hellmann, T., K. Murdock and J. Stiglitz. 1996.** *Financial Restraint: Toward a New Paradigm*. In: Aoki, M., H.-K. Kim and M. Okuno-Fujiwara (ed.). *The Role of Government in East Asian Economic Development*. Oxford: Calderon Press. 13–35.
- Heston A., R. Summers and B. Aten. 2001.** *Penn World Table Version 6.0*. Center for International Comparisons at the University of Pennsylvania (CICUP).
- King, R. G. and R. Levine. 1993.** *Finance and Growth: Schumpeter Might be Right*. In: *The Quarterly Journal of Economics* 108(3). August, 717–737.
- La Porta, R., F. Lopez-de-Silanes and A. Shleifer. 2002.** *Government Ownership of Banks*. In: *The Journal of Finance* 57(1). February. 265–301.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny. 1997.** *Legal Determinants of External Finance*. In: *The Journal of Finance* 52(3). July. 1131–1150.
- Mayer, C. 2000.** *Regulatory Principles and the Financial Services and Markets Act*. Mimeo.
- Pagano, M. 1993.** *Financial markets and growth. An overview*. In: *European Economic Review* 37. April. 613–622.
- Pagano, M. and P. Volpin. 2001.** *The Political Economy of Finance*. In: *Oxford Review of Economic Policy* 17(4). Winter. 502–519.
- Petersen, M. A. and R. G. Rajan. 1995.** *The Effect of Credit Market Competition on Lending Relationship*. In: *The Quarterly Journal of Economics* 110(2). 407–443.
- Romain, A. and B. v. Pottelsberghe de la Potterie. 2003.** *The Economic Impact of Venture Capital*. Université Libre de Bruxelles, Working Paper 03–20.
- Shaffer, S. 1998.** *The Winner's Curse in Banking*. In: *Journal of Financial Intermediation* 7(4). 359–392.
- Wachtel, P. 2001.** *Growth and Finance: What Do We Know and How Do We Know It?* In: *International Finance* 4(3). Winter. 335–362.

Appendix

Table 1

Correlations of the Average Growth Rate of Real GDP Per Capita and Financial Market Indicators: Average of 1990–1997

Growth indicator	Financial structure		Financial depth indicators			Efficiency of banks
	Bank concentration	Foreign bank penetration	Banks	Stocks	Total intermediation	
DRGDPL	-0.07 (0.68)	0.01 (0.48)	0.43*** (0.001)	0.16 (0.14)	0.51*** (~0)	0.04 (0.40)
DCAPITAL	-0.11 (0.76)	0.30** (0.02)	0.28** (0.02)	-0.14 (0.83)	0.26** (0.04)	-0.05 (0.64)
DEFF	-0.07 (0.68)	-0.29 (0.98)	0.24** (0.05)	0.43*** (0.001)	0.34*** (0.01)	-0.01 (0.54)

Note: p-values in brackets. *** significant at 0.01 level. ** significant at 0.05 level.

DRGDPL = growth rate of real per capita GDP, DCAPITAL = growth rate of physical capital accumulation per capita, DEFF = growth rate of residual efficiency (see section 2.2), Bank concentration = share of assets held by the three largest banks, Foreign bank penetration = share of assets foreign banks hold in total bank assets, Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, Efficiency of banks = Net interest rate margin.

Table 2

Cross-Country Regressions of Real GDP Growth Per Capita on Contemporaneous Financial Indicators, Cross-Country: 1990–1997

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DRGDPL	0.086** (0.04)	-0.017 (0.42)			0.007 (0.55)	-0.007 (0.15)	0.0001** (0.05)
R ² = 0.15							
DRGDPL	0.046 (0.44)	-0.038* (0.07)	0.035* (0.10)			-0.006** (0.41)	0.038 (0.24)
R ² = 0.18							
DRGDPL	0.081** (0.04)	-0.002 (0.92)		0.016*** (0.0001)	0.001 (0.94)	0.001 (0.94)	-0.007 (0.15)
R ² = 0.13							

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

*** significant at 0.01 level. ** significant at 0.05 level. * significant at 0.10 level.

DRGDPL = growth rate of real per capita GDP, Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School (= log of initial secondary school enrolment rate).

Table 3

Cross-Country Regressions of Growth of Physical Capital Accumulation Per Capita on Contemporaneous Financial Indicators, Cross-Country: 1990–1997

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DCAPITAL		-0.082*** (0.004)	0.057** (0.03)				
R ² = 0.26							
DCAPITAL	0.019 (0.52)	-0.098*** (0.004)	0.047 (0.21)	-0.009 (0.45)			
R ² = 0.29							
DCAPITAL	-0.008 (0.82)	-0.095*** (0.002)	0.033 (0.41)				0.045 (0.17)
R ² = 0.32							

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

*** significant at 0.01 level. ** significant at 0.05 level.

DCAPITAL = real per capita growth rate of physical capital accumulation. Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School (= log of initial secondary school enrolment rate).

Table 4

Cross-Country Regressions of Residual Efficiency Growth on Contemporaneous Financial Indicators, Cross-Country: 1990–1997

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DEFF	0.08***	0.011			0.007	-0.008**	0.00003
R ² = 0.10	(0.03)	(0.61)			(0.54)	(0.05)	(0.84)
DEFF	0.095***	0.013		0.018***		-0.009***	0.00003
R ² = 0.50	(0.01)	(0.57)		(0.002)		(0.01)	(0.82)

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

*** significant at 0.01 level. ** significant at 0.05 level.

DEFF = residual of real per capita GDP growth after accounting for the rate of physical capital accumulation, i.e. $DEFF = DRGDPL - 0.3 DCAPITAL$, Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School (= log of initial secondary school enrolment rate).

Table 5

Cross-Country Regressions of Real GDP Growth Per Capita on Contemporaneous Financial Indicators Taking Account of Interdependence Indicators, Cross-Country: 1990–1997

Dependent variable: Growth of real GDP per capita

Independent variable	OLS	
Constant	0.10**	(0.05)
RGDPL	0.01	(0.12)
LIQUIDITY	0.18***	(0.01)
CON	0.22***	(0.01)
CON × RGDPL	0.025***	(0.01)
LIQUIDITY × RGDPL	0.019***	(0.01)
R ²	0.52	

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

*** significant at 0.01 level. ** significant at 0.05 level.

RGDPL = log of initial real GDP per capita, LIQUIDITY = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, CON = the ratio of the three largest banks' assets to total banking sector assets.