Explaining market power differences in banking: a cross-country study

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Abstract

This paper presents evidence on the impact of bank-specific, regulatory, institutional, macro and financial structure variables on competition in banking, using information at national and bank level. With this aim, Lerner indices of market power are estimated using a sample of 10,479 annual observations over the period 1995-99 across 58 countries. Results show that although bank-specific characteristics explain a substantial proportion of market power (especially size and efficiency), market structure variables and, above all, the level of financial development also help to explain the differences observed in the levels of banking competition. Regulatory impediments to competition are not significant when controlling for financial development and financial structure.

Key words: banking, market power
JEL classification: G21, D43, L13

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1. Introduction

The banking sector plays a fundamental role in the economy insofar as financial intermediaries channel savings into investment. The greater the efficiency achieved in the process of intermediation and the greater the competition among the intermediaries, the lower the cost of intermediation and, therefore, the greater the savings available to finance economic growth.

Conscious of the importance of the subject, a substantial number of studies analyse banking competition[1]. The first ones focussed on the effect of bank concentration on performance, testing the traditional structure-conduct-performance *versus* efficient structure hypothesis. To this end, bank concentration measures (such as the Herfindahl-Hirschamn or n-firm concentration ratios) were used as proxy variables for competition. The initial studies were expanded by including proxy variables for efficiency with the aim of testing the so-called efficient structure hypothesis (Berger, 1995).

Since then the banking literature has analysed the evolution of the intensity of banking competition using diverse instruments of industrial organisation economics (the so-called "new empirical industrial organization" literature). More specifically, the published studies use optimisation models from which are derived indicators of competition such as the Lerner index, the Breshnahan mark-up test, the Panzar and Ross test ("H-statistic"), the estimation of conjectural variation parameters, etc.

More recently, the researchers have expanded the study of competition by analysing the effect of the competitive environment (regulatory and institutional variables), using samples that contain countries with different levels of development. In particular, two recent studies stand out. Demirgüç-Kunt et al (2004) examine the impact of bank-specific characteristics, bank regulations, market structure, and institutional development on bank net interest margins and overheads costs, using bank-level data across 72 countries, while Barth et al. (2004) examine the relationships between a broad array of bank regulations and supervisory practices and aggregate measures of bank development, performance and stability, using a cross-country database.

Despite the abundance of literature existing on banking competition, there is a scarcity of studies analysing the explanatory factors of market power, especially for the specific case of cross-country studies. The only exception is the recent paper by

[1] See the recent survey by Berger et al (2004).

Claessens and Laeven (2004), who apply the Panzar and Rosse methodology to estimate the degree of competition in the banking systems of 50 countries[2]. This subject is especially relevant, as although it is important to know the degree of competition in the bank markets, from an economic policy point of view it is more important to identify the sources of market power. Only when the sources of market power are identified will it be possible to implement the necessary actions to reduce the social inefficiency associated with the existence of market power.

In this context, the aim of this paper is to analyse the impact of bank-specific, market structure, regulatory, institutional, macro and financial structure variables on bank market power across countries. To this aim, we use a panel data of 10,479 annual observations over the period 1995-99 covering 58 banking sectors. The sample used combines information at national and bank levels. One of the main novelties of the paper is that we use Lerner indices as indicators of market power, which allows us to analyse the effect of bank-specific variables on banking competition using bank level information.

The article is divided into 5 sections. After this introduction, section 2 presents the approach used for the measurement of market power in banking, and the empirical results for the 58 countries of the sample. Section 3 identifies the potential explanatory variables of market power in banking and its empirical approach. Based on regressions of market power on bank-specific, market structure, regulatory, institutional and financial structure variables, section 4 presents the results of the analysis of the explanatory factors of market power. Finally, section 5 concludes.

2. The measurement of market power in banking: empirical results

2.1. The Lerner index of market power

The numerous studies of banking competition have used various instruments to measure market power. A possible classification of the instruments used allows us to classify them into two groups. In the first we find the instruments with solid theoretical foundations. This group includes instruments based on the new empirical industrial organization literature: the Lerner index (Prescott and McCall, 1975; Maudos and Fernández de Guevara, 2004; Fernández de Guevara et al. 2004; Fernández de Guevera and Maudos, 2004), the Breshnahan mark-up test (Shaffer 1993; Shaffer and Disalvo,

[2] Claessens and Laeven (2004) relate Panzar and Rosse´s test of competition to indicators of countries´ banking system structures and regulatory regimes.

1994; Suominen, 1994), the Panzar and Rosse test (Molyneux et al., 1994; De Bandt and Davis, 2000; Bikker and Haaf, 2002; Shaffer, 2004; Claessens and Laeven 2004); conduct parameter (Barros, 1999; Neven and Röller, 1999; Kim and Vale, 2001; Canhoto, 2004; Coccorese, 2004; Pinho, 2000) and Tobin´s q (Keeley, 1990). In the second group, we include measurements that are not based on any model of industrial organization, such as the so-called structure-conduct-performance paradigm vs efficient structure hypothesis (Berger, 1995) as well as the use of measures of concentration as a proxy for market power.

Among the instruments with solid theoretical foundations, in this paper we use Lerner indices to measure market power for two reasons: firstly, the Lerner index can be estimated for each bank in the sample; consequently, we can analyse the determinants of market power using information at firm level (bank-specific variables); and secondly, the evolution of market power can be analysed estimating a Lerner index for each year.

The estimation of Lerner indices has been widely used in the banking sector as indicators of degrees of market power. Some of the most important studies in this area are Shaffer (1993) for Canadian banks, Angelini and Cetorelli (2003) for Italian banks, Maudos and Pérez (2001) for the Spanish banking sector, and Fernández de Guevara et al. (2004), Maudos and Fernández de Guevara (2004) and Fernández de Guevara and Maudos (2004) for a sample of countries of the European Union.

In the case of banking companies, the model most often used as a reference from which a Lerner index expression is obtained is the Monti-Klein imperfect competition model[3]. This model examines the behaviour of a monopolistic bank faced with a deposit supply curve of positive slope $D(r_D)$ and a loan demand curve of negative slope $L(r_L)$. The decision variables of the bank are D (volume of deposits) and L (volume of loans), and for simplicity's sake the level of capital is assumed to be given. The bank is assumed to be a price taker in the inter-bank market (r), so that the objective function of profits to be maximised is as follows:

$$\Pi = \Pi(L, D) = (r_L(L) - r)L + (r - r_D(D))D - C(L, D) \quad (1)$$

so that profit is the net interest income between deposits and loans, after deducting the transformation costs $C(L,D)$. The first order conditions with respect to deposits and loans are as follows:

[3] See a survey in Freixas and Rochet (1997).

$$\frac{\partial \Pi}{\partial L} = \frac{\partial r_L}{\partial L} L + r_L - r - \frac{\partial C}{\partial L} = 0 \rightarrow \qquad \frac{\left[r^*_L - r - \frac{\partial C}{\partial L} \right]}{r^*_L} = \frac{1}{\varepsilon_L}$$
$$\frac{\partial \Pi}{\partial D} = -\frac{\partial r_D}{\partial D} D + r - r_D - \frac{\partial C}{\partial D} = 0 \rightarrow \qquad \frac{\left[r - r^*_D - \frac{\partial C}{\partial D} \right]}{r^*_D} = \frac{1}{\varepsilon_D} \tag{2}$$

ε_D and ε_L being the elasticities of demand for deposits and loans, respectively.

The Lerner index for expression (2) represents the extent to which the monopolist's market power allows it to fix a price above marginal cost, expressed as proportional to the price. In the case of perfect competition, the value of the index is zero, there being no monopoly power. Starting from this extreme case, the lower the elasticity of demand, the greater the monopoly power to fix a price above the marginal cost. As Fernández de Guevara et al (2004) show, the relative margins, rather than the absolute margins, are the most appropriate for evaluating the evolution of competition, for two reasons. First, oligopoly competition models determine a relation of equilibrium between the relative margin (price minus marginal cost divided by the price) and the structural and competitive conditions of the market. And second, the relative margin offers a proxy for the loss of social welfare that is due to the existence of market power.

The extension of the model to the case of an oligopoly (N banks) provides the following expression of the first order conditions:

$$\frac{\left[r^*_L - r - \frac{\partial C}{\partial L} \right]}{r^*_L} = \frac{1}{N\varepsilon_L}$$
$$\frac{\left[r - r^*_D - \frac{\partial C}{\partial D} \right]}{r^*_D} = \frac{1}{N\varepsilon_D} \tag{3}$$

which differs from the case of monopoly only in that the elasticities are multiplied by the number of competitors (N). With this simple adaptation, the Monti-Klein model can be reinterpreted as a model of imperfect competition with two extreme cases: monopoly (N=1) and perfect competition (N=infinity).

Unfortunately, the database used (BankScope) does not provide sufficiently detailed information about the profit and loss account for the calculation of separate prices for deposits and loans[4]. For that reason, we use a single indicator of banking

[4] In the case of loans, the profit and loss account does not give the financial income associated with these separately, it appears jointly with other financial products (fixed income investments, for example). In the case of deposits, the financial costs are included with those of other liability products.

activity in the empirical model of this study and, as in Shaffer (1993), Berg and Kim (1994), Maudos and Fernández de Guevara (2004) and Fernández de Guevara et al. (2004), banking output is proxied by the total assets of each firm. The starting assumption is that the flow of banking goods and services produced by a bank is proportional to its total assets. With this approximation, we construct an average price that includes interest and non-interest income, and both financial and operating costs are computed to estimate marginal costs.

2.2 Data

The data used combine information at national and bank level. In the first case, we use information on market structure, regulatory, institutional, macroeconomic, and financial structure variables. Information on regulation is obtained from the Barth et al. (2001) database and from the Heritage Foundation. Institutional variables are obtained from Kaufmann and Zoido-Lobaton (2002), the Heritage Foundation and the World Development Indicators (WDI) data base of the World Bank. Macroeconomic variables come from WDI data base. The data on financial structure variables are obtained from the World Bank (2001). Market concentration variables have been constructed using the Bankscope database provided by Bitch-IBCA. Finally, other proxy variables for market structure (state ownership and foreign ownership) are from Barth el al. (2001).

Considering that information on regulation refers to commercial banks over the period 1995-99, bank level information also refers only to commercial banks. Our sample of commercial banks contains 10,479 annual observations over the period 1995-99. Data are from reported balance sheets and profit and loss accounts of commercial banks. Bank level information is from the BankScope database provided by Bitch-IBCA. Banks with missing data needed for estimating the Lerner index and some where data errors seemed quite likely were not included, however[5]. With these restrictions, the unbalanced panel data used covers around 83% of all commercial banking assets for 58 countries classified in seven geographical areas: the European Union (16 countries, including Switzerland), East European countries (7), Africa (9), Asia (12), North America (2), South America (9) and Oceania (3). Table 1 shows the number of banks and market shares of the sample used.

>Insert table 1 <

[5] Banks whose input prices (information needed to estimate marginal costs) lie outside the interval of +/- 2.5 times the relevant standard deviation were deleted.

2.3 Results

The calculation of marginal costs is based on the usual specification of a translogarithmic cost function where as a measure of production we use total assets (TA) and three input prices w (labor, fixed capital and loanable funds) are computed[6].

$$\ln C_i = \alpha_0 + \ln TA_i + \frac{1}{2}\alpha_k (\ln TA_i)^2 + \sum_{j=1}^{3} \beta_j \ln w_{ji} +$$
$$+\frac{1}{2}\sum_{j=1}^{3}\sum_{k=1}^{3}\beta_{jk} \ln w_{ji} \ln w_{ki} + \frac{1}{2}\sum_{j=1}^{3}\gamma_j \ln TA_i \ln w_{ji} + \mu_1 Trend + \mu_2 \frac{1}{2} Trend^2 + \quad (4)$$
$$+\mu_3 Trend \ln TAi + \sum_{j=1}^{3}\lambda_j trend \ln w_{ji} + \ln u_i$$

where C_i is the bank's total costs including financial and operating costs.

The estimation of the costs function is done separately for each geographic area, allowing the parameters of the cost function to vary from one area to another to reflect different technologies. Fixed effects are also introduced in order to capture the influence of variables specific to each firm. A trend variable is included to reflect the effect of technical change. As usual, the estimation is made under the imposition of restrictions of symmetry and of grade one homogeneity in input prices.

Table 2 contains the average value for period 1995-99 of price, marginal cost, absolute margin (price-marginal cost) and relative margin (Lerner index) for each banking sector in the sample and for the geographical areas[7]. Focusing on margins, the absolute margin (price-marginal cost) presents significant variation among countries. Thus, absolute margins are very narrow in almost all the European Union banking sectors (around 1%), but are very wide in South America and Eastern Europe

Regarding market power, there are also important differences among countries. The last column of table 2 shows that market power is high (a Lerner index over 30%) in Latvia (36%), Ghana (39%), Zambia (36%), Nepal (33%), and Jamaica (31%), while it is low (below 10%) in Ireland (7%), Luxembourg (8%), Netherlands (9%) and Panama (6%). A comparison between the main economic areas shows that market power is higher in the USA (23%) and Japan (20%) than in the European Union (15%).

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[6] The prices of the factors of production are here defined as follows: Price of labour: Personnel costs / total assets. Price of capital: Operating costs (except personnel costs) / Fixed assets. Price of loanable funds: Financial Costs / Customer and short term funding.

[7] The values corresponding to the geographical areas are weighted averages, using total assets as a weighting.

>Insert table 2<

3. Explanatory variables of market power

A standard Monti-Klein model of banking competition shows that the Lerner index of market power depends on the number of competitors and the demand elasticity. In the same line, this standard model has been extended in other papers with the aim of incorporating additional explanatory variables of market power. Thus, Corvosier and Gropp (2002) and Fernández de Guevara et al. (2004) show that the Lerner index of market power depends on bank-specific variables and the structural characteristics of the market (market concentration and the elasticity of demand).

In this section we analyse the impact of bank-specific, market structure, regulatory, institutional, macro and financial structure variables on market power across countries. More precisely, the potential explanatory variables of market power are as follows (table 3 contains the mean weighted averages of the bank-specific variables for the period 1995-99):

a) <u>Bank-specific variables</u>

As mentioned before, all bank-specific variables are constructed using information from the BankScope database. Variables vary across banks and years.

Bank Size is defined as the logarithm of total assets in each year. The variable is used as explanatory of market power for two reasons: 1) in case there are advantages in average costs associated with the possible existence of economies of scale; and 2) to test whether size, *per se*, confers market power. As table 2 shows, there are important differences in bank size across countries.

Market share equals the bank's assets divided by total bank assets in the economy. Although for the reason given above the data set is formed only by commercial banks, the market share of each bank is defined with respect to total bank assets (not only commercial banks).

Efficiency is the cost to income ratio (overheads/gross income). We introduce efficiency as an explanatory variable of market power to discriminate between the traditional structure-conduct-performance paradigm and the efficient structure hypothesis. In the first case it is to be expected that concentration will affect market power positively and significantly. On the other hand, under the efficient structure hypothesis the most efficient banks are supposed to gain market share (so they act in more concentrated markets) and are more profitable. Therefore, it is efficiency, and not concentration, that determines higher banking margins. Following Berger (1995), the way to test these hypotheses is by introducing concentration, efficiency and market share as explanatory variables of the relative margin.

Bank Risk is constructed as the standard deviation of ROA over the period 1995-99. Taking into account that banks tend to compensate greater risk with higher margins, we expect a positive influence of this variable on relative margin (Lerner index).

Fee income. The effect of specialization on market power is proxied by the income structure of each bank. More precisely, the variable equals non-interest income divided by total assets. Some argue that the increase of the importance of non-interest income in recent years is due to increasing competition in traditional banking activity (intermediation between deposits and credits), which obliges banks to engage in non-traditional activities (mainly fee income sources). For that reason, we anticipate a positive influence of *fee income* on market power.

Bank equity is a measure of bank capitalization, and is defined as the ratio of bank equity to total assets. If banks with high equity ratios face lower bankruptcy costs and, consequently, lower funding costs, a positive influence of this variable on relative margins (Lerner index) is expected.

>Insert table 3<

b) Market structure variables

Table 4 contains the mean of the national level variables classified in four groups: market structure, institutional, macroeconomic, and financial structure variables. For the first group, three variables of market structure are used:

Bank concentration is measured by the Herfindahl-Hirshman index (HHI). For each country and year, concentration is computed using bank-level data from the BankScope database. Taking into account that concentration is a characteristic of the market, the HH index is computed as the sum of the squares of the market shares of all banks (commercial banks, savings banks, cooperative banks, etc) existing in a country. To check the robustness of the results, alternatively we use the CR3 and CR5 variables (market share of the three or five largest banks in the country). As table 3 shows, concentration varies considerably among banking sectors. HHI ranges from a low value in the USA (1.03) and Germany (1.88) to a high value in some African banking sectors (68.41 in Zambia; 65.04 in Botswana).

State ownership equals the share of banking system assets that are in state-owned banks, that is, banks that are 50% or more government owned (Source: Barth et al., 2001). In the sample, India (80%), Romania (70%), and Bangladesh (70%) have banking systems where state-owned banks account for more than 70% of the market.

Foreign ownership measures the degree of foreign ownership, approximated by the fraction of the banking system's assets that is in banks that are 50% or more foreign owned (Source: Barth et al., 2001). In New Zealand (99%), Botswana (98%), Jordan (68%) and Zambia (64%), the market share of banks foreign owned is higher than 60%.

>Insert Table 4 <

c) Regulatory variables

Fraction of entry denied is the fraction of entry applications denied (both domestic and foreign). In the banking sectors of the European Union and North America, the fraction of entry denied is very low (0.03 in the EU and 0.06 in North America). On the contrary, in Asia and Africa, some banking sectors deny more than 50% of the entry applications. This variable is obtained from the Barth et al. (2001) database.

Activity restrictions is a measure of the degree to which national authorities allow banks to engage in activities that generate non-interest income (securities, insurance, real state, and bank ownership of nonfinancial firms). The measure varies from 0 to 16, where higher values indicate greater restrictions. India (14), Indonesia (14), Romania (13), Jordan (13), Guatemala (13) present the highest values in this measure, while Latvia (2), Kuwait (2.5) present the lowest ones. This variable is from the Barth et al (2001) database.

Banking freedom is an indicator that provides an overall measure of openness of the banking sector and the extent to which banks are free to operate their businesses. It ranges from 1 to 5. Higher values signify more freedom. The indicator is calculated as 6 minus the banking freedom index of the Heritage Foundation. It is expected that market power is lower as banking freedom is higher. Banking freedom is high in

Netherlands, UK, Australia, New Zealand, and Panama. On the opposite side, Greece, Nigeria, Nepal, and Mexico present the lowest levels of the banking freedom indicator (Source: Economic Freedom Index of the Heritage Foundation)

d) Institutional variables

Property rights is an indicator of the protection of private property rights. The indicator ranges from 1 to 5, higher values indicating better protection of property rights. It is calculated as 6 minus the property freedom index of the Heritage Foundation. In general, countries of the European Union, North America and Oceania extensively protect property rights, while Croatia and Bangladesh present the lowest values of the indicator (Source: Economic Freedom Index of the Heritage Foundation).

KKZ institution index is an aggregate indicator of the quality of institutional development in the country. The index is calculated using information on six issues: voice accountability, political stability, government's effectiveness, regulatory quality, rule of law, and control of corruption (Source: Kaufman et al., 2002). In the European Union and North America the KKZ index is very high, while in East Europe and Asia (except Singapore and Japan) the quality of institutional development is low.

Economic freedom is an overall indicator of economic freedom that captures the degree individuals and firms feel free to conduct their business. This variable comes from the Economic Freedom Index of the Heritage Foundation. The indicator ranges from 1 to 5. UK, Switzerland, Singapore, USA, and New Zealand are at the top of the ranking, India and Slovenia at the bottom.

GDPpc is the real per capita GDP. It is used as an overall indicator of institutional development. It comes from the World Development Indicators data base of the World Bank.

e) Macro variables

Inflation is the annual growth rate of the CPI index. Huybens et al. (1999) show that inflation artificially increases banking margins. Demirgüç-Kunt et al. (2004) also show that theory suggests that inflation influences interest margins. These authors show that the effect of inflation on interest margins is positive, although the impact is not economically huge. (Source: World Development Indicators of the World Bank).

GDP growth is the annual rate of growth of GDP. The variable is introduced to capture the possible effect of the business cycle. (Source: World Development Indicators of the World Bank).

f) Financial structure/development variables

With the aim of analysing whether the level of banks' market power depends on the financial structure of the economies (market-based vs. bank-based), an index of financial structure is introduced as an explanatory variable of market power. In addition, we investigate the impact of financial structure after controlling for the level of financial development (both bank and stock market development). These variables are obtained from World Bank (2001). More precisely, the variables used are the following:

Bank is the banking assets/GDP ratio, and measures the size of the banking sector. In general, as table 4 shows, richer countries have larger banking sectors.

Market capitalization is constructed as stock market capitalization divided by GDP. This variable provides a measure of the size of the stock markets.

Bank Credit is constructed as the ratio of credit to the private sector/GDP. This variable reflects the activity of the banking sector.

Total value traded is defined as the quotient between the value of the trading of domestic exchanges and GDP. This value is used as an indicator of the efficiency or liquidity/activity of the stock markets. The liquidity is very high in Switzerland, Malaysia, and USA, while it is very low in African stock markets.

Financial structure index is an overall index of financial structure which captures whether a financial system is bank-based or market-based. More precisely, it is constructed as a means-removed average of relative size, relative activity and relative efficiency measures. Higher values of the index indicate a more market-based financial system. Using the World Bank (2001) information, the index has been elaborated following the methodology described in Demirgüç-Kunt and Levine, 2001.

4. Explaining market power differences in banking: empirical results

To analyse the effect of bank-specific, regulatory, institutional, macro and financial structure variables on market power, regressions are estimated using a random-effects model. The advantage of using the random effects panel estimator is that it allows us to estimate the effect of variables which are constant across banks (in a given country) and over time (as is the case for the regulatory and institutional variables)[8].

4.1. The effect of bank-specific and market structure variables

Table 5 presents regressions of the Lerner index on bank-specific variables and market structure variables. Depending on data availability for the market structure variables, the number of observations varies from 8,431 to 10,288.

Column (1) reports results using the Herfindalh-Hirshman index (HHI) as proxy for bank concentration. Bank size affects the Lerner index positively, which indicates that large banks tend to have more market power. However, market share does not have a statistically significant influence on market power, indicating that what is relevant for explaining differences in market power is not the market share, but the size. Fee income has a positive impact on market power, which indicates that banks more specialized in fee-based activities tend to have higher relative margins. This is consistent with the view that competition is higher in the traditional task of intermediation (taking deposits and granting loans) than in other banking activities (such as off-balance-sheet activities that generate non-interest income). Highly capitalized banks have higher market power, which may reflect the fact that such banks pay less for deposits as depositors consider these banks to be more secure. Bank risk has a positive and statistically significant influence on market power, which indicates that more risky banks have to compensate their higher probability of default with higher margins. Finally, bank concentration (HHI) has a positive impact on market power.

Columns (2) and (3) check the robustness of results using CR3 and CR5, respectively, as proxy variables for bank concentration. Both CR3 and CR5 have a statistically significant influence on market power but with a negative sign, which shows the importance of measuring market concentration adequately[9]. From a theoretical point of view, the HH index is superior, as absolute market concentration

[8] The same approach is used by Demirguç-Kunt et al (2002).
[9] Claessen and Laeven (2004) report a positive relationship between CR5 and the degree of competition, suggesting that bank concentration may not be a good summary statistic for banks' competitive environment.

measures (e.g. CR3 or CR5) only take into consideration the market share of the largest banks. For this reason, the HHI variable is used in the rest of the study.

Column (4) additionally introduces two indicators of market structure: the importance of the foreign presence in the ownership of banks (*foreign ownership*) and the degree of government involvement in the banking sector (*state ownership*) In the first case, results show that market power decreases as the degree of foreign ownership of banks increases. This result is consistent with the research that suggests that foreign-owned banks generate more competition in the national markets (see Martinez Peria and Mody, 2004 and Claessens and Laeven, 2004). In the second case, the state ownership variable enters with a negative sign.

In terms of economic magnitude, the greatest impacts are those of size and of efficiency. Thus if the size of a bank increases by 10%, its market power increases by 3.3%. In the case of efficiency, an improvement of 10% in the cost to income ratio translates into an increase of 2.4pp. in the Lerner index, representing an increase of 11.2% in the bank's market power. In the case of market share, fee income, bank equity and risk, the economic magnitude is much smaller (less than 1% of variation in the Lerner index if these variables increase 10%). In the case of concentration, its economic significance is very small as an increase of 10% in the HH index translates into an increase of 0.3% in the Lerner index. Finally, if the foreign ownership variable increases by 10%, market power decreases by 1%.

>Insert table 5<

4.2. Bank-specific, market structure and regulatory variables

Table 6 shows results introducing additionally the effect of regulatory variables (fraction of entry denied, activity restrictions and banking freedom) on market power. The results in column (1) show that in countries that refuse a higher proportion of bank entry applications, market power is higher. This result indicates that the barriers to entry protect existing banks against foreign competitors, allowing them to enjoy higher relative margins.

If activity restrictions is used as a proxy for regulatory restrictions (column 2), results show that market power is higher in countries that restrict banks from engaging in non-traditional activities (securities underwriting, real state, owning non-financial firms, and insurance). This is consistent with the results of Demirgüç-Kunt et al (2004) who suggest that restrictions on bank activities are associated with higher margins.

Claessens and Laeven (2004) also find that cross-country variations in bank competition can be explained by differences in lack of activity restrictions, with fewer restrictions enhancing competition.

Finally, banking freedom also presents a negative and statistically significant impact on market power, which indicates that market power is low in countries where banks are free to operate their businesses.

The economic size of the determinants of market power is very unequal. Thus, while a growth of 10% in the efficiency of a bank (fall in the cost to income ratio) translates into an increase of 2.3 pp. in its market power, an increase of 10% in any other variable translates into a variation of the Lerner index of less than 1 pp. In the case of regulatory variables, the greatest economic impact corresponds to the activity restrictions variable (if this variable increases by 10%, market power increases 3.5%) followed by banking freedom (a 10% increase translates into a loss of market power of 2.2%)[10].

To summarise, as in Demirgüç-Kunt et al. (2004), the results show the importance of bank regulation in explaining differences in bank margins (in our case, relative margins) among countries, the economic impact of activity estrictions being similar to the economic impact of size.

>Insert table 6<

4.3. Bank-specific, market structure, regulatory and macro variables

With the aim of analysing the additional effect of macroeconomic variables, table 7 shows the results incorporating inflation and GDP growth as explanatory variables of market power.

Inflation has a positive influence on market power, indicating that relative margins are higher in countries with higher inflation rates. If in addition we introduce the effect of economic growth (column 2), the results indicate that market power depends also on the business cycle. Results also indicate that inflation retains the

[10] As banking freedom provides an overall index of bank freedom (which captures the effect of different regulatory variables), in the rest of the study we report the results using this variable as a proxy for the impediments to competition.

positive relationship with market power once economic growth is introduced into the regression.

Although the macroeconomic variables are statistically significant, the economic significance is very low, especially in the case of GDP growth. In particular, if the inflation rate increases by 10%, the Lerner index increases by 0.3 pp, while a 10% increase in GDP growth translates into an increase of 0.1 pp. In other words, if inflation rate and GDP growth increase 10%, market power only increases 1.2% and 0.6%, respectively.

It is also noteworthy that the rest of the explanatory variables of market power maintain their sign and magnitude after incorporation of the macroeconomic variables, the economic impact of efficiency and size again being outstandingly high.

> Insert table 7<

4.4. Bank-specific, market structure, regulatory, macro and institutional variables

Following the strategy of incorporating additional potential explanatory variables of market power, table 8 shows results incorporating institutional impediments to banking competition. The first column reports results using per capita GDP as a proxy for institutional development. The effect of this variable is negative and statistically significant, suggesting that richer countries enjoy lower levels of market power. If we use an aggregate index of the level of institutional development (KKZ index), column (2) shows that countries where the institutional environment is more "stable" and guarantees a better protection of persons and properties, banking competition is more intensive. Results also suggest (column 3) that in countries with greater protection of private property rights, banks achieve lower levels of market power.

In terms of economic magnitude, the effect of institutional variables is low, compared to the effect of bank-specific variables. Thus, a 10% increase in the per capita GDP implies a 0.6% reduction in market power. Although the effect of economic freedom is greater (1.8%), this effect is not statistically significant.

>Insert table 8<

4.5. Bank-specific, market structure, regulatory, macro, institutional and financial structure variables

Finally, in table 9 we examine the impact of the all potential explanatory variables of banking competition, including the effect of bank-specific, market structure, regulatory, institutional and, additionally, financial structure variables.

If we focus first on the effect of financial structure (bank-based vs. market-based), once we control for the activity of the banking sector (credit/GDP) and the stock market (total value traded/GDP), results show that a more market-based financial structure would lead to lower levels of market power. If instead of controlling for financial activity, we control for financial development (by including bank/GDP and market capitalization/GDP), the financial structure variable also has a negative influence on market power, suggesting that banking competition is more intensive in countries with a more market-based financial structure.

The negative (and statistically significant) effect of the activity (credit/GDP) and development/size (bank/GDP) of the banking markets suggest that in well-developed banking markets competition is higher. In the case of the stock markets, both market capitalization/GDP and total value traded/GDP have a positive and significant effect, which suggests that well-developed stock markets allow banks to achieve higher relative margins. A possible explanation is that in this situation, banks can specialize in non-interest income activities, which allow banks to enjoy higher levels of market power. In terms of economic magnitude, the influence of the financial development of banking markets is very important: a 10% increase of the credit/GDP ratio (bank/GDP) is associated with a 2.32% (1.42%) decrease in market power.
>Insert table 9<

Table 10 shows the percentage variation of the Lerner index in response to a 10% increase in its determinants (evaluated at average sample values). As the results indicate, the main explanatory factors of market power in banking are efficiency and size, larger and more efficient banks achieving higher relative margins. Macroeconomic variables have a very small economic impact (but statistically non significant), the presence of foreign capital being relatively important in encouraging banking competition. Although financial development (both of the stock market and, to a greater extent, banking markets) is important for explaining differences in market power, the economic significance of financial structure is very small.

>Insert table 10<

5. Conclusions

The measurement of the degree of competition in any economic sector is of great relevance in that the level of social welfare decreases as the monopoly power of firms increases. In the specific case of the banking sector, the analysis of the social inefficiency associated with market power is even more important if we take into account the importance of the financial intermediation function in economic growth. Thus, the greater the market power of financial intermediaries the higher will be the cost of financial intermediation and, in consequence, the lower economic growth.

From the point of view of economic policy, it is as important to measure the degree of competition in banking markets as to analyse the determinants of market power. Only when such factors have been clearly identified will it be possible to instrument suitable measures to reduce the market power of banks.

In this context, this paper presents empirical evidence of the impact on market power of bank-specific, market structure, regulatory, institutional, macro and financial structure variables, using bank level data across 58 countries over the period 1995-99. The main conclusions of the paper are:

a) From the point of view of the magnitude of the economic impacts, bank-specific variables are the most important for explaining the differences in market power among banks. Nevertheless, although the influence of the totality of bank-specific variables is statistically significant, there are substantial differences of economic significance among these variables, particularly the high magnitude of the effect of bank size and, above all, efficiency. More precisely, a 10% increase in bank size or efficiency, would translate into an increase of 3.5% and 11.1%, respectively, of market power.

b) Market structure variables are also seen to be significant in the explanation of differences in market power. Thus an increase in bank market concentration positively affects market power, competition being lower in the countries with less foreign presence among bank shareholders and with lower proportion of state owned banks. In the case of market concentration, the economic significance is low, showing the limitations of using concentration measures as indicators of competition. Also, the results differ depending on the indicator of concentration used (Herfindalh index or CR(n)), which constitutes additional evidence of the limitaciones of measures of concentration as indicators of competition.

c) Bank regulations help to explain some of the differences observed in the market power of banks. Thus, market power is greater in countries with a high proportion of entry applications refused, where banks face regulatory restrictions on their activities (in securities, insurance, etc.), and with a low level of banking freedom. However, the effect of regulation is not significant when controlling for financial development variables. Likewise, macroeconomic conditions are not seen to be relevant in the explanation of the differences in market power when controlling for financial development and financial structure variables.

d) The empirical evidence suggests that banks have higher market power in countries with underdeveloped banking markets. On the other hand, market power is lower in countries with developed stock markets. Furthermore, when controlling for financial development, banking competition is higher in market-based financial systems, though the economic magnitude is negligible.

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Table 1. Number of banks and market shares (% of total assets of commercial banks in each country) of the sample.

Country	1995	1996	1997	1998	1999	Total	Market Share (%)
Austria	35	35	31	31	31	163	69.74
Belgium	30	33	35	27	25	150	95.07
Denmark	51	52	50	50	48	251	90.22
Finland	6	5	7	7	7	32	99.89
France	179	176	157	159	152	823	86.99
Germany	190	194	200	189	164	937	94.03
Greece	14	16	15	14	10	69	86.50
Ireland	6	4	5	5	4	24	7.44
Italy	63	67	67	72	70	339	95.68
Luxembourg	94	91	91	89	92	457	91.41
Netherlands	16	20	16	13	14	79	14.54
Portugal	18	20	22	22	18	100	91.22
Spain	59	66	66	62	54	307	98.20
Sweden	7	9	5	6	8	35	97.34
Switzerland	153	156	152	140	137	738	98.58
United Kingdom	29	33	31	31	29	153	24.24
EU	**950**	**977**	**950**	**917**	**863**	**4,657**	**88.91**
Croatia	17	26	32	27	25	127	93.97
Czech Republic	9	15	17	13	15	69	3.90
Hungary	8	10	11	9	11	49	47.95
Latvia	15	15	17	11	17	75	86.61
Lithuania	3	5	9	8	8	33	87.35
Poland	25	25	28	29	28	135	79.25
Romania	3	4	6	11	17	41	72.12
East Europe	**171**	**192**	**198**	**161**	**178**	**900**	**44.62**
Botswana	5	5	5	4	4	23	99.72
Ghana	5	7	7	7	8	34	85.10
Israel	11	11	11	10	12	55	95.06
Kenya	0	4	7	16	16	43	7.90
Mauritius	0	0	4	5	5	14	51.91
Nigeria	11	24	33	32	36	136	63.56
Saudi Arabia	6	9	8	9	8	40	85.32
South Africa	12	12	14	13	16	67	92.89
Zambia	1	0	0	5	6	12	32.00
Africa	**51**	**72**	**89**	**101**	**111**	**424**	**88.83**
Bangladesh	10	14	17	17	21	79	85.40
China	0	0	3	3	4	10	80.81
India	55	52	54	55	55	271	95.41
Japan	129	134	127	126	49	565	82.46
Jordan	6	7	7	7	7	34	97.19
Kuwait	5	6	6	6	6	29	97.82
Malaysia	32	32	30	24	30	148	94.05
Nepal	4	6	6	8	8	32	84.54
Singapore	0	7	11	11	11	40	75.10
Slovenia	8	8	11	10	11	48	63.12
Sri Lanka	8	8	7	7	8	38	94.41
Thailand	13	14	11	10	7	55	83.99
Asia	**270**	**288**	**290**	**284**	**217**	**1349**	**83.11**
Canada	25	35	35	34	32	161	16.98
United States	389	389	387	371	360	1896	95.62
North America	**414**	**424**	**422**	**405**	**392**	**2,057**	**92.65**
Australia	19	21	17	18	18	93	93.11
Indonesia	67	66	55	29	33	250	69.20
New Zealand	5	5	6	6	6	28	89.11
Oceanía	**91**	**92**	**78**	**53**	**57**	**371**	**89.48**
Argentina	5	11	12	50	71	149	66.39
Bolivia	10	13	11	11	9	54	82.70
Brazil	89	102	98	98	91	478	93.31
Chile	21	24	23	21	20	109	85.38
Guatemala	4	0	0	0	0	4	2.29
Jamaica	5	5	5	4	6	25	93.43
Mexico	26	29	25	23	27	130	91.60
Panama	3	18	19	5	6	51	19.79
Peru	16	22	20	20	14	92	97.56
South America	**179**	**224**	**213**	**232**	**244**	**1,092**	**90.98**
All	**2,035**	**2,177**	**2,162**	**2,100**	**2,005**	**10,479**	**82.65**

Source: Bankscope

Table 2. Lerner index of market power. Weighted averages for period 1995-99

	Price (%)	Marginal Cost (%)	Price-Marginal Cost (%)	Lerner Index (%)
Austria	5.84	4.95	0.89	15.48
Belgium	6.12	5.27	0.86	14.06
Denmark	6.10	5.11	1.00	16.00
Finland	5.86	4.70	1.16	19.80
France	6.81	6.07	0.74	10.89
Germany	6.02	5.11	0.91	14.76
Greece	11.30	9.86	1.44	13.16
Ireland	4.99	4.61	0.38	6.64
Italy	7.95	6.73	1.22	15.92
Luxembourg	7.17	6.66	0.51	7.67
Netherlands	7.29	6.54	0.75	9.15
Portugal	8.15	7.10	1.05	13.53
Spain	7.53	6.35	1.19	16.01
Sweden	6.94	5.52	1.42	20.19
Switzerland	5.06	4.13	0.93	18.69
United Kingdom	6.62	4.97	1.65	25.39
UE	**6.57**	**5.61**	**0.96**	**14.83**
Croatia	10.00	7.04	2.96	28.59
Czech Republic	10.68	8.43	2.25	21.02
Hungary	15.38	12.75	2.64	17.81
Latvia	12.55	7.75	4.79	36.12
Lithuania	14.17	10.06	4.11	27.90
Poland	14.47	10.31	4.16	28.24
Romania	26.08	19.24	6.84	28.00
East Europe	**13.07**	**9.88**	**3.19**	**24.03**
Bostwana	13.94	10.11	3.82	27.59
Ghana	22.90	14.05	8.86	38.53
Israel	7.15	6.43	0.73	11.59
Kenya	20.79	17.11	3.68	17.92
Mauritus	10.96	8.57	2.39	22.27
Nigeria	16.40	11.93	4.47	26.64
Saudi Arabia	6.91	5.40	1.51	21.59
South Africa	16.97	14.85	2.12	12.61
Zambia	22.52	14.48	8.04	35.75
Africa	**10.60**	**9.02**	**1.58**	**15.52**
Bangladesh	6.96	6.56	0.40	4.80
China	5.92	4.28	1.64	27.27
India	10.74	9.05	1.68	15.60
Japan	3.73	3.01	0.72	20.08
Jordan	8.19	6.71	1.48	18.19
Kuwait	7.58	5.89	1.70	22.22
Malaysia	8.02	5.93	2.09	25.98
Nepal	10.51	7.01	3.50	33.48
Singapore	5.63	4.09	1.53	27.22
Slovenia	10.34	8.11	2.23	20.97
Sri Lanka	12.46	9.98	2.48	19.70
Thailand	10.27	9.05	1.23	9.95
Asia	**4.18**	**3.38**	**0.80**	**20.01**
Canada	6.71	7.60	0.90	12.09
United States	6.67	8.72	2.05	22.99
North of America	**6.67**	**8.68**	**2.01**	**22.58**
Australia	5.92	8.24	2.32	28.13
Indonesia	13.36	17.18	3.82	21.79
New Zealand	7.26	9.24	1.99	21.72
Oceania	**7.06**	**9.54**	**2.48**	**26.55**
Argentina	8.16	10.81	2.65	24.63
Bolivia	11.52	13.08	1.56	12.75
Brazil	18.54	22.55	4.01	17.92
Chile	10.77	12.18	1.41	11.59
Guatemala	12.03	14.06	2.03	14.42
Jamaica	13.31	19.39	6.08	30.90
Mexico	18.83	25.63	6.79	27.45
Panama	7.70	8.25	0.55	5.73
Peru	10.58	13.64	3.06	22.02
South America	**17.54**	**23.15**	**5.61**	**24.47**
All	**10.40**	**9.35**	**2.40**	**19.98**

Source: Bankscope and own elaboration

Table 3. Bank-specific variables. Weighted averages for period 1995-99.

Country	Size (million of dollars)	Market share (%)	Efficiency (%)	Fee income (%)	Bank risk	Bank equity (%)
Austria	5,473	22.54	60.60	2.90	43.25	4.48
Belgium	20,891	19.52	69.10	2.82	47.42	3.19
Denmark	3,867	21.26	59.96	3.51	33.43	6.08
Finland	25,811	37.60	60.40	4.13	33.11	4.83
France	11,048	8.99	75.44	4.57	59.19	3.58
Germany	9,816	12.26	64.97	3.08	57.52	4.17
Greece	5,669	24.72	67.77	9.27	67.28	5.62
Ireland	2,179	2.67	34.92	0.38	21.65	8.20
Italy	12,002	6.81	68.51	4.99	50.76	6.12
Luxembourg	4,412	3.43	40.62	2.97	36.33	3.31
Netherlands	2,970	3.61	54.97	5.92	30.74	6.02
Portugal	6,796	9.68	65.77	5.32	51.61	5.61
Spain	7,788	12.13	70.13	4.43	41.10	5.43
Sweden	29,201	28.72	56.95	5.05	46.42	3.86
Switzerland	6,104	32.54	72.91	5.12	86.23	4.89
United Kingdom	12,943	18.93	65.87	7.95	34.41	4.57
EU	**10,931**	**15.00**	**67.39**	**4.28**	**54.66**	**4.39**
Croatia	341	17.28	65.55	10.80	189.28	11.95
Czech Republic	3,653	15.56	56.05	6.82	74.94	7.12
Hungary	1,529	14.57	68.92	8.90	134.00	6.40
Latvia	127	11.48	65.56	20.77	221.36	11.30
Lithuania	210	21.45	73.14	18.01	208.64	9.85
Poland	1,394	7.85	48.95	7.78	113.47	11.04
Romania	622	34.58	37.27	14.52	283.09	12.58
East Europe	**2,222**	**13.85**	**55.76**	**8.32**	**114.56**	**8.92**
Bostwana	288	28.90	54.06	14.61	83.99	9.03
Ghana	153	24.37	45.67	26.67	268.67	11.41
Israel	9,716	22.89	68.22	5.90	27.50	6.49
Kenya	43	0.99	57.68	3.74	98.06	12.20
Mauritus	633	28.20	39.65	3.56	66.79	15.19
Nigeria	408	6.25	64.87	23.60	143.41	9.05
Saudi Arabia	10,567	14.33	57.84	4.59	32.78	9.98
South Africa	6,933	20.26	65.16	11.39	113.73	5.52
Zambia	70	14.32	58.25	18.49	216.54	11.78
Africa	**8,608**	**19.08**	**63.91**	**7.99**	**61.48**	**7.35**
Bangladesh	638	17.10	86.88	7.11	93.15	3.54
China	26,323	5.90	35.66	0.48	71.02	5.42
India	3,364	9.17	62.85	6.77	50.18	4.76
Japan	59,324	4.65	55.50	1.47	15.26	3.86
Jordan	3,030	56.28	53.88	5.48	62.30	7.10
Kuwait	5,627	23.20	36.41	3.87	41.90	10.52
Malaysia	3,918	8.46	39.53	3.68	53.85	7.96
Nepal	88	20.68	38.12	9.00	62.92	7.18
Singapore	12,925	20.16	34.01	1.37	45.30	11.22
Slovenia	619	12.57	62.29	8.97	78.21	10.74
Sri Lanka	628	29.53	59.18	10.67	79.03	7.44
Thailand	12,597	12.67	80.57	4.51	136.62	7.17
Asia	**54,746**	**5.46**	**55.42**	**1.73**	**20.28**	**4.17**
Canada	4,254	3.71	69.25	5.02	35.80	5.32
United States	9,205	2.66	63.28	10.61	60.47	7.77
North America	**9,018**	**2.70**	**63.50**	**10.40**	**59.54**	**7.68**
Australia	20,262	14.87	61.06	7.74	39.86	7.38
Indonesia	1,330	6.36	54.06	5.07	208.35	7.60
New Zealand	10,302	20.35	68.09	6.09	25.91	4.11
Oceanía	**16,603**	**14.37**	**60.94**	**7.20**	**60.62**	**7.03**
Argentina	2	8.38	71.00	13.31	121.31	10.19
Bolivia	2	11.87	55.71	4.24	81.09	7.39
Brazil	5	8.01	76.27	19.01	309.85	9.55
Chile	1	9.78	61.85	3.58	57.64	8.13
Guatemala	1	4.42	76.59	1.01	71.55	8.52
Jamaica	19	39.16	68.49	9.48	177.01	8.35
Mexico	38	13.57	70.40	7.44	201.81	7.17
Panama	0	2.66	40.56	1.58	47.79	7.16
Peru	3	15.41	71.38	11.41	143.58	8.59
South America	**25**	**13.35**	**71.49**	**10.76**	**219.24**	**8.02**
All	**14,593**	**11.97**	**62.63**	**7.24**	**84.34**	**6.80**

Source: Bankscope and own elaboration

Table 4. Market structure, regulatory, institutional, macro and financial structure variables.

Country	Market Structure Variables				Regulatory Variables			Institutional Variables			
	HHI (%)	CR (3) (%)	State Ownership	Foreign ownweship	Fraction of entry applications denied	Activity restrictions	Banking freedom	Average of property rights	KKZ Institution index	Economic freedom	GDPpc (thousands of 1995 US dollars)
Austria	7.69	21.36	0.04	0.05	0.07	5	4.60	4.8	1.37	3.90	30.49
Belgium	10.65	25.15			0.00	9	4.00	4.75	0.9	3.90	28.47
Denmark	10.18	28.62	0.00		0.08	8	4.00	5	1.58	3.86	35.97
Finland	25.09	39.62	0.22	0.08	0.00	7	3.00	4.5	1.62	3.78	27.78
France	3.96	15.53			0.00	6	3.00	3.8	1.02	3.65	27.77
Germany	1.88	8.91	0.42	0.04	0.00	5	4.00	4.8	1.37	3.80	30.79
Greece	15.51	46.82	0.13	0.05	0.00	9	2.00	3.8	0.63	3.12	11.90
Ireland	8.58	35.94			0.00	8	4.00	4.8	1.4	3.98	21.72
Italy	3.22	13.80	0.17	0.05	0.26	10	3.33	3.8	0.91	3.54	19.70
Luxembourg	2.91	11.65	0.05	0.95	0.00	6	4.00	4.75	1.46	4.05	48.28
Netherlands	12.46	39.19	0.06		0.00	6	5.00	4.75	1.64	4.00	28.54
Portugal	7.22	27.05	0.21	0.12	0.00	9	3.00	4	1.2	3.51	11.64
Spain	4.68	16.61	0.00	0.11	0.00	7	3.50	3.8	1.11	3.48	15.78
Sweden	9.59	31.68	0.00	0.02	0.07	9	3.33	4	1.53	3.49	28.39
Switzerland	15.02	32.10	0.15	0.09	0.00	5	4.50	5	1.72	4.06	44.45
United Kingdom	3.62	17.98	0.00			5	5.00	4.8	1.5	4.13	20.58
EU	**8.89**	**25.79**	**0.11**	**0.16**	**0.03**	**7.13**	**3.77**	**4.45**	**1.31**	**3.77**	**27.02**
Croatia	14.10	32.66	0.37	0.07		7	3.00	2	0.03	2.39	4.63
Czech Republic	13.12	34.87	0.19	0.26	0.36	8	5.00	4	0.68	3.77	5.19
Hungary	24.61	43.35	0.03	0.62	0.33	9	3.75	4	0.87	3.01	4.70
Latvia	17.69	41.66	0.00		0.00	2	3.75	3.25	0.26	3.10	2.22
Lithuania	26.46	57.75	0.44	0.48	0.50	9	2.80	3	0.26	2.85	2.06
Poland	14.36	35.12	0.44	0.26	0.00	10	3.00	3.6	0.7	2.96	3.22
Romania	31.81	56.28	0.70	0.08	0.35	13	3.00	2.4	-0.08	2.55	1.53
East Europe	**20.31**	**42.67**	**0.31**	**0.30**	**0.26**	**8.29**	**3.47**	**3.18**	**0.39**	**2.95**	**3.36**
Botswana	65.04	70.59	0.02	0.98	0.33	10	3.67	3.8	0.56	2.95	3.42
Ghana	29.41	44.97	0.38	0.54	0.78	12	3.00	3.2	-0.14	2.72	0.39
Israel	16.89	48.81				13	3.00	4	0.68	3.17	16.30
Kenya	12.05	32.93			0.85	10	3.33	3	-0.78	2.78	0.34
Mauritius	22.22	60.99	0.00	0.26		13	4.00	4	0.69	3.35	3.72
Nigeria	27.21	42.65	0.13	0.00	0.00	9	2.33	3.2	-1	2.73	0.25
Saudi Arabia	19.32	47.40	0.00	0.00	0.00	11	3.00	4.25	-0.24	3.20	6.86
South Africa	11.70	31.51	0.00	0.05	0.26	8	3.00	3.2	0.11	3.08	3.94
Zambia	68.41	56.49	0.23	0.64	0.00	13	4.00	3.2	-0.2	3.07	0.39
Africa	**30.25**	**49.87**	**0.11**	**0.35**	**0.32**	**11.00**	**3.26**	**3.54**	**-0.04**	**3.01**	**3.96**
Bangladesh	12.73	36.47	0.70	0.64	0.79	12	2.80	2	-0.39	2.43	0.34
China	15.11	46.04			0.25	14	3.00	2.2	-0.2	2.44	0.68
India	6.29	22.06	0.80	0.00	0.47	10	2.00	2.8	0	2.19	0.42
Japan	2.85	12.68	0.01	0.06	0.00	13	3.33	4.8	0.95	3.99	43.47
Jordan	33.64	60.43	0.00	0.68		11	4.00	3.8	0.33	3.08	1.60
Kuwait	11.93	32.73	0.00			2.5	3.00	4.5	0.34	3.48	14.94
Malaysia	6.16	22.45	0.00	0.18		10	3.00	3.8	0.51	3.38	4.54
Nepal	28.20	61.79	0.20	0.35	0.21	8	2.00	2.75	-0.29	2.53	0.23
Singapore	13.21	30.46	0.00	0.50		8	4.00	4.8	1.44	4.54	25.14
Slovenia	12.98	44.71	0.40	0.05	0.00	9	4.00	3.5	0.85	2.29	10.23
Sri Lanka	18.78	60.37	0.55			7	4.00	3.4	-0.38	3.26	0.81
Thailand	7.84	24.29	0.31	0.07	1.00	9	3.00	4.2	0.15	3.66	2.84
Asia	**14.14**	**36.88**	**0.27**	**0.28**	**0.39**	**9.46**	**3.18**	**3.55**	**0.28**	**3.11**	**8.77**
Canada	11.49	34.13	0.00		0.13	7	4.00	4.8	1.43	3.89	20.73
United States	1.03	5.59	0.00	0.05	0.00	12	4.00	4.8	1.29	4.16	29.27
North America	**6.26**	**19.86**	**0.00**	**0.05**	**0.06**	**9.50**	**4.00**	**4.80**	**1.36**	**4.03**	**25.00**
Australia	9.08	26.13	0.00	0.17	0.00	8	5.00	4.8	1.41		21.91
Indonesia	16.89	24.79	0.44	0.07	0.60	14	3.00	3	-0.76	2.97	1.06
New Zealand	14.90	54.06	0.00	0.99	0.00	4	5.00	4.75	1.59	4.21	17.00
Oceania	**13.62**	**34.99**	**0.15**	**0.41**	**0.20**	**8.67**	**4.33**	**4.18**	**0.75**	**3.59**	**13.32**
Argentina	6.53	24.98	0.30	0.49	0.00	7	3.75	4	0.33	3.54	7.99
Bolivia	11.74	36.27	0.00	0.42	0.00	12	3.50	3.6	0.02	3.23	0.94
Brazil	9.56	30.84	0.52	0.17	0.74	10	3.00	3	0	2.59	4.49
Chile	15.41	41.69	0.12	0.32		11	3.00	4.6	0.87	3.68	5.00
Guatemala	9.84	25.17	0.08	0.05	0.30	13	3.33	3	-0.5	3.21	1.50
Jamaica	23.67	56.82	0.56	0.44		12	4.00	3.6	-0.03	3.24	2.21
Mexico	9.24	34.27	0.25	0.20		12	2.00	3	-0.07	2.86	3.40
Panama	61.17	53.46	0.12	0.38	0.06	8	5.00	3.2	0.11	3.56	3.58
Peru	16.96	46.80	0.03	0.40	0.00	8	4.00	3.4	-0.18	3.10	2.30
South America	**18.23**	**38.69**	**0.22**	**0.32**	**0.18**	**10.33**	**3.51**	**3.49**	**0.06**	**3.22**	**3.49**
All	**15.96**	**35.54**	**0.17**	**0.27**	**0.21**	**9.20**	**3.65**	**3.88**	**0.59**	**3.38**	**12.13**

Source: See text

Table 4. Market structure, regulatory, institutional, macro and financial structure variables. Cont.

Country	Macroeconomic Variables		Financial Structure Variables				
	Inflation	GDP growth (%)	Bank asstes/GDP (%)	Stock Market capitalization/ GDP (%)	Credit to the private sector/GDP (%)	Total value traded/GDP (%)	Financial structure Index
Austria	1.03	2.31	1.29	14.84	98.59	7.93	-0.28
Belgium	1.03	2.50	1.49	55.36	75.60	14.58	-0.21
Denmark	1.04	2.60	0.54	43.82	34.06	27.56	0.20
Finland	1.02	4.70	0.62	78.04	50.81	39.44	0.33
France	1.03	2.26	1.02	48.54	82.01	33.04	-0.13
Germany	1.03	1.54	1.41	35.75	113.96	31.05	-0.18
Greece	1.13	2.98	0.69	38.59	26.00	44.13	0.21
Ireland	1.04	9.60	0.80	45.54	50.47	31.88	-0.01
Italy	1.06	1.89	0.96	29.60	1.00	23.68	-0.12
Luxembourg	1.03	5.63	1.00	171.28	93.56	3.76	0.23
Netherlands	1.04	3.58	1.15	105.64	105.99	94.29	0.20
Portugal	1.05	3.96	0.99	28.88	92.09	21.58	-0.17
Spain	1.05	3.54	1.05	46.17	85.87	74.90	0.11
Sweden	1.01	2.99	0.63	92.92	41.10	69.35	0.79
Switzerland	1.01	1.31	1.81	182.80	168.70	175.77	0.36
United Kingdom	1.06	2.82	1.15	138.70	118.10	75.49	0.27
EU	**1.04**	**3.39**	**1.04**	**72.94**	**80.88**	**48.03**	**0.10**
Croatia	1.10	4.24	0.49	11.52	0.03	0.79	-0.27
Czech Republic	1.18	1.88	0.74	21.84	59.90	10.15	-0.21
Hungary	1.44	3.29	0.34	13.33	22.35	17.12	0.03
Latvia	1.23	3.70	0.16	3.55	8.54	0.96	-0.25
Lithuania	1.29	4.68	0.16	6.36	0.00	1.68	-0.16
Poland	1.35	5.74	0.31	5.38	15.58	4.88	-0.22
Romania	3.95	-0.18	0.19	0.27	8.25	0.62	-0.34
East Europe	**1.65**	**3.33**	**0.34**	**9.13**	**19.11**	**5.17**	**-0.20**
Botswana	1.19	5.80	0.13	8.50	12.92	0.93	-0.13
Ghana	1.78	4.38	0.07	17.43	6.83	0.48	0.79
Israel	1.19	4.02	0.88	37.00	77.41	10.99	-0.16
Kenya	1.19	2.71	0.37	15.35	30.82	0.76	-0.18
Mauritius	1.14	5.28	0.65	36.17	45.68	2.26	-0.15
Nigeria	1.37	2.50	0.13	6.38	10.61	0.31	-0.17
Saudi Arabia	1.01	0.96	0.41	32.13	24.06	7.56	0.02
South Africa	1.16	2.57	0.66	151.41	66.34	32.05	0.60
Zambia	1.43	1.55	0.13	11.70	7.27	0.19	-0.16
Africa	**1.27**	**3.31**	**0.38**	**20.12**	**26.95**	**6.17**	**0.05**
Bangladesh	1.09	5.01	0.29	4.45	27.73	1.36	-0.30
China	1.08	8.76	1.00	22.66	0.00	29.35	-0.20
India	1.19	6.53	0.34	28.43	22.48	12.69	0.11
Japan	1.01	1.28	1.27	65.72	116.41	28.84	-0.10
Jordan	1.09	3.34	0.71	66.90	71.06	6.78	-0.01
Kuwait	1.04	0.98	1.02	64.66	44.78	51.91	0.31
Malaysia	1.07	5.19	1.10	195.80	96.56	101.42	0.66
Nepal	1.16	4.27	0.27	5.09	26.43	0.23	-0.29
Singapore	1.02	6.05	1.13	142.41	106.05	73.54	0.34
Slovenia	1.19	4.24	0.41	5.65	26.55	2.63	-0.28
Sri Lanka	1.25	4.94	0.32	12.43	23.23	1.57	-0.21
Thailand	1.12	1.54	1.14	48.39	109.69	25.19	-0.12
Asia	**1.11**	**4.34**	**0.75**	**64.12**	**61.44**	**27.96**	**-0.01**
Canada	1.03	3.64	0.73	78.08	66.03	46.21	0.24
United States	1.05	3.84	0.73	115.56	45.96	127.43	0.83
North America	**1.04**	**3.74**	**0.73**	**96.82**	**56.00**	**86.82**	**0.54**
Australia	1.03	4.38	0.81	72.78	51.40	38.74	0.12
Indonesia	1.45	1.68	0.54	23.09	33.63	12.84	-0.12
New Zealand	1.03	2.82	1.04	48.72	94.42	16.53	-0.14
Oceania	**1.17**	**2.96**	**0.80**	**48.20**	**59.82**	**22.70**	**-0.05**
Argentina	1.01	2.25	0.28	19.38	24.57	4.04	-0.08
Bolivia	1.17	3.89	0.51	2.00	54.69	0.02	-0.34
Brazil	1.20	2.22	0.42	23.52	27.16	17.18	0.03
Chile	1.13	5.64	0.52	84.22	62.63	10.40	0.26
Guatemala	1.20	4.22	0.18	0.00	16.81	0.03	-0.33
Jamaica	1.35	-0.51	0.32	22.34	26.36	1.69	-0.10
Mexico	1.61	2.88	0.33	22.75	13.05	10.73	0.09
Panama	1.02	4.40	0.76	21.34	89.32	0.52	-0.27
Peru	1.19	3.65	0.23	20.07	27.08	6.08	0.07
South America	**1.21**	**3.18**	**0.39**	**28.18**	**37.96**	**5.63**	**-0.07**
All	**1.21**	**3.46**	**0.63**	**48.50**	**48.88**	**28.93**	**0.05**

Source: See text

Table 5: Regression results using bank-specific and market structure variables

	(1)		(2)		(3)		(4)	
Bank Size	0.0137	***	0.0120	***	0.0119	***	0.0108	***
	(0.0006)		(0.0006)		(0.0006)		(0.0007)	
Market share	-0.0001		0.0005		0.0005		0.0009	***
	(0.0003)		(0.0003)		(0.0003)		(0.0003)	
Fee income	0.0103	***	0.0104	***	0.01036	***	0.0093	***
	(0.0004)		(0.0004)		(0.0004)		(0.0004)	
Efficiency	-0.0037	***	-0.0037	***	-0.0037	***	-0.0036	***
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Bank Equity	0.0008	***	0.0007	***	0.0007	***	0.0003	***
	(0.0001)		(0.0001)		(0.0001)		(0.0002)	
Bank Risk	0.0052	***	0.0051	***	0.0051	***	0.0057	***
	(0.0013)		(0.0013)		(0.0013)		(0.0012)	
HHI	0.0009	***					0.0010	
	(0.0001)						(0.0001)	
CR3			-0.0159	***				
			(0.0029)					
CR5					-0.0152	***		
					(0.0023)			
State ownership							-0.0918	***
							(0.0089)	
Foreign ownership							-0.1296	***
							(0.0079)	
Constant	0.2703	***	0.2912	***	0.2927	***	0.3339	***
	(0.0061)		(0.0058)		(0.0058)		(0.0072)	
R2	0.53		0.54		0.54		0.6	
Nobs.	10,288		10,288		10,288		8,431	

Note: Dependent variable is the Lerner index of market power. All country-level variables are averages for the period 1995-99.

We use GLS with random effects. Between parentheses, standard errors.*,**,*** indicate significance level of 10,5 and 1 per cent, respectively.

Table 6: Regression results using bank-specific, market structure and regulatory variables

	(1)	(2)	(3)
Bank Size	0.0094 ***	0.0109 ***	0.0109 ***
	(0.0007)	(0.0007)	(0.0007)
Market share	0.0010 **	0.0007 ***	0.0007 ***
	(0.0004)	(0.0003)	(0.0003)
Fee income	0.0087 ***	0.0098 ***	0.0094 ***
	(0.0004)	(0.0004)	(0.0004)
Efficiency	-0.0039 ***	-0.0036 ***	-0.0036 ***
	(0.0000)	(0.0000)	(0.0000)
Bank Equity	0.0003 **	0.0005 ***	0.0004 ***
	(0.0002)	(0.0002)	(0.0002)
Bank Risk	0.0058 ***	0.0032 ***	0.0052 ***
	(0.0013)	(0.0012)	(0.0012)
HHI	0.0010 ***	0.0010 ***	0.0010 ***
	(0.0001)	(0.0001)	(0.0001)
State ownership	-0.0896 ***	-0.0719 ***	-0.1086 ***
	(0.0099)	(0.0087)	(0.0096)
Foreign ownership	-0.1347 ***	-0.1048 ***	-0.1262 ***
	(0.0080)	(0.0078)	(0.0079)
Fraction of entry denied	0.0360 ***		
	(0.0107)		
Activity restrictions		0.0084 ***	
		(0.0006)	
Banking freedom			-0.0127 ***
			(0.0029)
C	0.3663 ***	0.2474 ***	0.3822 ***
	(0.0078)	(0.0093)	(0.0131)
R2	0.61	0.62	0.60
Nobs.	7,626	8,431	8,431

Note: Dependent variable is the Lerner index of market power. All country-level variables are averages for the period 1995-99.

We use GLS with random effects. Between parentheses, standard errors.*,**,*** indicate significance level of 10,5 and 1 per cent, respectively.

Table 7: Regression results using bank-specific, market structure, regulatory and macro variables

	(1)		(2)	
Bank Size	0.0109	***	0.0107	***
	(0.0007)		(0.0007)	
Market share	0.0007	***	0.0007	***
	(0.0003)		(0.0003)	
Fee income	0.0094	***	0.0094	***
	(0.0004)		(0.0004)	
Efficiency	-0.0036	***	-0.0036	***
	(0.0000)		(0.0000)	
Bank Equity	0.0003	***	0.0003	***
	(0.0002)		(0.0002)	
Bank Risk	0.0047	***	0.0049	***
	(0.0012)		(0.0012)	
HHI	0.0010	***	0.0010	***
	(0.0001)		(0.0001)	
State ownership	-0.1144	***	-0.1103	***
	(0.0098)		(0.0099)	
Foreign ownership	-0.1262	***	-0.1390	***
	(0.0079)		(0.0089)	
Banking freedom	-0.0109	***	-0.0073	***
	(0.0030)		(0.0032)	
Inflation	0.0198	***	0.0237	***
	(0.0069)		(0.0070)	
GDP growth			0.0041	***
			(0.0014)	
Constant	0.3561	***	0.3283	***
	(0.0159)		(0.0183)	
R2	0.60		0.60	
Nobs.	8,431		8,431	

Note: Dependent variable is the Lerner index of market power. All country-level variables are averages for the period 1995-99.

We use GLS with random effects. Between parentheses, standard errors.*,**,*** indicate significance level of 10,5 and 1 per cent, respectively.

Table 8: Regression results using bank-specific, market structure, regulatory, macro, and institutional variables

	(1)	(2)	(3)	(4)
Bank Size	0.0117 ***	0.0122 ***	0.0103 ***	0.0109 ***
	(0.0008)	(0.0007)	(0.0007)	(0.0007)
Market share	0.0004	0.0005 **	0.0008 ***	0.0007 ***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Fee income	0.0095 ***	0.0096 ***	0.0094 ***	0.0095 ***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Efficiency	-0.0036 ***	-0.0036 ***	-0.0036 ***	-0.0036 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Bank Equity	0.0004 ***	0.0004 ***	0.0003 ***	0.0003 ***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Bank Risk	0.0046 ***	0.0041 ***	0.0050 ***	0.0047 ***
	(0.0012)	(0.0012)	(0.0012)	(0.0012)
HHI	0.0009 ***	0.0007 ***	0.0010 ***	0.0009 ***
	(0.0001)	(0.0001)	(0.0002)	(0.0002)
State ownership	-0.1156 ***	-0.1146 ***	-0.1000 ***	-0.1146 ***
	(0.0100)	(0.0098)	(0.0124)	(0.0105)
Foreign ownership	-0.1305 ***	-0.1423 ***	-0.1379 ***	-0.1389 ***
	(0.0093)	(0.0088)	(0.0090)	(0.0089)
Banking freedom	-0.0026	0.0117 **	-0.0133 ***	-0.0045
	(0.0035)	(0.0042)	(0.0045)	(0.0039)
Inflation	0.0189 **	0.0157 ***	0.0242 ***	0.0217 ***
	(0.0071)	(0.0070)	(0.0071)	(0.0072)
GDP growth	0.0027 **	0.0054 ***	0.0040 ***	0.0039 ***
	(0.0014)	(0.0014)	(0.0014)	(0.0014)
GDP per capita	-0.0006 ***			
	(0.0002)			
KKZ index		-0.0297 ***		
		(0.0043)		
Economic freedom			0.0103	
			(0.0070)	
Property rights				-0.0048
				(0.0041)
Constant	0.3276 ***	0.2829 ***	0.312296 ***	0.3413 ***
	(0.0182)	(0.0192)	(0.0247)	(0.0213)
R2	0.60	0.61	0.61	0.60
Nobs.	8,431	8,431	8,431	8,431

Note: Dependent variable is the Lerner index of market power. All country-level variables are averages for the period 1995-99.

We use GLS with random effects. Between parentheses, standard errors.*,**,*** indicate significance level of 10,5 and 1 per cent, respectively.

Table 9: Regression results using bank-specific, market structure, regulatory, macro, institutional and financial structure variables

	(1)		(2)	
Bank Size	0.0106	***	0.0115	***
	(0.0008)		(0.0008)	
Market share	0.0010	***	0.0007	***
	(0.0003)		(0.0003)	
Fee income	0.0082	***	0.0089	***
	(0.0000)		(0.0004)	
Efficiency	-0.0038	***	-0.0036	***
	(0.0000)		(0.0000)	
Bank Equity	0.0002		0.0003	***
	(0.0002)		(0.0002)	
Bank Risk	0.0037	***	0.0037	**
	(0.0012)		(0.0012)	
HHI	0.0005	***	0.0004	***
	(0.0002)		(0.0002)	
State ownership	-0.0988	***	-0.0981	***
	(0.0111)		(0.0112)	
Foreign ownership	-0.1296	***	-0.1517	***
	(0.0106)		(0.0110)	
Banking freedom	0.0005		0.0021	
	(0.0036)		(0.0035)	
Inflation	0.0039		0.0092	
	(0.0074)		(0.0072)	
GDP growth	-0.0015		-0.0009	
	(0.0017)		(0.0018)	
GDP per capita	0.0004	**	-0.0005	***
	(0.0002)		(0.0002)	
Credit/GDP	-0.0683	***		
	(0.0073)			
Total value traded/GDP	0.0241	***		
	(0.0018)			
Bank/GDP			-0.0333	***
			(0.0050)	
Market capitalization/GDP			0.0235	***
			(0.0025)	
Structure	-0.017356	***	-0.0123	***
	(0.0071)		(0.0075)	
Constant	0.386228	***	0.3502	
	(0.0184)		(0.0183)	
R2	0.62		0.61	
Nobs.	8,130		8,133	

Note: Dependent variable is the Lerner index of market power. All country-level variables are averages for the period 1995-99.

We use GLS with random effects. Between parentheses, standard errors.*,**,*** indicate significance level of 10,5 and 1 per cent, respectively.

Table 10. Economic significance of the market power determinants

	(1)	(2)
Bank Size	3.24	3.53
Market share	0.09	0.07
Fee income	0.72	0.79
Efficiency	-11.81	-11.12
Bank Equity	0.11	0.15
Bank Risk	0.14	0.14
HHI	0.18	0.16
State ownership	-0.82	-0.82
Foreign ownership	-1.00	-1.17
Banking freedom	0.09	0.37
Inflation	0.21	0.49
GDP growth	-0.22	-0.13
GDP per capita	0.46	-0.59
Credit/GDP	-2.32	
Total value traded/GDP	0.63	
Bank/GDP		-1.42
Market capitalization/GDP		0.82
Structure	-0.14	-0.10

Note: The data in the table indicate the percentage variation of the Lerner index in response to a 10% increase in its determinants, evaluated at average sample values