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Bank Competition and Firm Growth in the Enlarged European Union

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Abstract

We examine the impact of bank competition and institutional factors on net firm entry in a sample of European manufacturing industries over the 1995-2006 period. Taking into account industry differences in the need for external finance, we find that bank competition helps firm entry. In addition, better institutions – especially legal structure and property rights – also have a positive impact, particularly through a better functioning financial system.

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1. INTRODUCTION

Competition in financial services has been an important policy objective for Europe in recent years. The Financial Services Action Plan, the White Paper on Financial Services Policy (2005-2010) and the Lisbon Agenda all argue that competition will improve overall economic performance.^a Academic support for this proposition has come from a number of studies in recent years (e.g. Bertrand et al, 2007, Cetorelli and Strahan, 2006, Claessens and Laeven, 2005), which have established a link between bank competition and economic performance. However, an empirical analysis investigating this relationship for the enlarged European Union is missing to date.

In addition, the ongoing financial crisis is prompting policymakers to re-evaluate the regulation of financial services. At these times it is particularly relevant to base policy decisions on up-to-date and relevant scientific research.

Our paper advances on both fronts. We estimate the impact of bank competition and the institutional framework on firm growth, a major driver of product market competition, innovation and productivity growth. Our sample covers 110 European manufacturing sectors in 26 countries, including most new EU members. We confirm the beneficial effects of bank competition. We also highlight areas for improvement in the new EU members. Our study is thus a timely reminder of the beneficial effects of bank competition.

In Section 2 we discuss measurement issues of bank competition, and review the theory and evidence on the link between bank competition and economic performance. Section 3 introduces our methodology and data, while Section 4 presents and discusses our findings, with a particular focus on the new EU members. Section 5 concludes.

^a See for example the report of the High Level Group chaired by Wim Kok: “Facing the Challenge: The Lisbon Strategy for Growth and Employment”, November 2004 (<http://ec.europa.eu/growthandjobs/pdf/2004-1866-EN-complet.pdf>), page 26.

2. LITERATURE REVIEW

2.1. Measurement issues

A variety of methods have been developed to gauge and investigate competition in this unique sector of the economy. Beck (2008) distinguishes three groups of competition measures. The first group describes market structure (concentration ratios, number of banks or Herfindahl indices). Studies using these rather crude indicators investigate actual market shares without regard to banks' competitive behaviour. A key issue is the potential endogeneity of market structure: while the structure-conduct-performance postulates that market structure affects competitive behaviour, the efficient structure hypothesis states that the observed market structure is the optimum outcome of firms' behaviour.

The second group of literature (e.g. Bikker et al., 2007, Bikker and Spierdijk, 2008) is based on the model of Panzar and Rosse (1987). They propose an H-statistic which is equal to the sum of elasticities of the total interest revenue of the banks with respect to the input prices (deposit rate, wages, price of equipment or fixed capital). In a perfectly competitive environment any change in input prices causes total revenue and marginal cost to move together, therefore $H=1$. Under imperfect competition this is not the case: in particular, $H \leq 0$ with monopoly and $0 < H < 1$ with monopolistic competition.^b

The third strand of literature uses indicators of the regulatory framework, such as entry requirements, barriers, or activity restrictions. These measures usually describe the contestability of the market and may be useful in assessing various aspects and sources of bank competition.

2.2. Bank competition and economic performance

Levine (2005) surveys the theoretical and empirical links between finance and growth. His conclusion is that better developed financial systems indeed matter for growth. He argues that the key functions of financial systems are

^b See for instance Claessens and Laeven (2004), or Bikker et al. (2007) for derivations of the H-statistic.

- producing ex ante information on investment opportunities and capital allocation;
- monitoring of investments and corporate governance;
- facilitating risk trading, diversification and management;
- mobilising and pooling of savings;
- easing the exchange of goods and services.

Are more competitive banking sectors better at performing these tasks? Standard industrial-organisation theory suggests that lower market power leads to higher credit supply at lower cost. Guzman (2000) shows that capital accumulation is slower with monopolistic banking systems than with competitive ones, for various reasons. Credit is more likely to be rationed in monopolistic banking industries; rationing is more stringent; and finally, credit monitoring is excessive even in the absence of rationing.

If competition raises bank efficiency, then a key area for efficiency gains is the selection and monitoring of loans. However, theory is ambiguous on the matter (see Freixas, 2005). First, in an adverse selection environment lending banks have an ex post information monopoly over their competitors, and can hold up existing borrowers. This gives rise to a “bargain-then-ripoff” pricing structure: competition for new customers drives down prices for new borrowers but raises them for locked-in clients.[°] If bank competition increases, access to funds for riskier firms (including startups) increases and prices decrease in both periods (Petersen and Rajan, 1995, present a less general model with the opposite result). Second, more competition can reduce the incentive of banks to invest in relationships (Chen, 2007, provides a contrarian view). However, competition also increases the market for relationship loans whenever firms see value in relationships (and do not choose it just because they are unable to get market finance). In addition, banks can switch from homogeneous transaction loans to differentiated relationship loans to shield themselves from price competition (Boot and Thakor, 2000). This way, efficiency can still improve with more bank competition. Third, bank relationships can insure borrowers against future interest rate shocks but lower bank market power reduces the ability of banks to provide such insurance.

Regardless of the theoretical ambiguity, recent empirical results tend to support the view that competition raises efficiency, also in Europe. In western Europe, the 1999 Financial Services

[°] The pricing model is similar to that with switching costs (Klemperer, 1987). Indeed, the information barrier faced by lending banks acts as a switching cost to borrowers.

Action Plan of the European Commission brought a multitude of new legislation aimed at the reduction of entry barriers and the facilitation of competition and cross-border integration. Euro introduction added further momentum to bank competition through the integration of European capital markets. Casu and Girardone (2006) as well as Schaeck and Čihák (2008) provide evidence on the beneficial effects of greater competition in western Europe.

Bank competition in transition economies is shaped by three further major factors: economic reforms (including institutional changes related to EU accession), privatisation and the presence of foreign-owned banks. Lensink and Hermes (2004) argue that foreign banks raise competition and also bring positive spill-over effects, such as new financial services, management innovations, better bank regulation and supervision. Positive evidence is provided by Claessens et al. (2001) in a global sample. On the other hand, Lensink and Hermes (2004) demonstrate that the relationship is non-linear: foreign banks decrease efficiency at lower levels of economic development, but tend to increase it at higher levels. Fries and Taci (2005) find lower bank costs in eastern European countries with a higher foreign bank shares, but show that efficiency gains were concentrated at the early stages of reforms. On a more sceptical note, Degryse et al. (2008) show that the greater efficiency of foreign banks is due to their portfolio differences: they lend to more transparent borrowers using lower cost of credit, while domestic counterparts specialize in less transparent clients.

Regarding privatisation per se, evidence is less supportive of efficiency gains. Bonin et al. (2005a) find that it is foreign buyers rather than privatisation itself which raises efficiency; Bonin et al. (2005b) show that the method and timing of privatisation matters although they find no evidence of a selection bias. This view is contended by the analysis of Havrylchyk and Jurzyk (2008), who conclude that the superior performance of foreign banks is „not inherited but earned”.

Empirical studies on the link between bank competition and economic performance are harder to come by. Claessens and Laeven (2005) estimate the impact of banking sector H-statistics on industry-level growth rates in 16 countries between 1980 and 1990, where the impact is allowed to vary with industry-level financial dependence. They find that external financing intensive industries develop considerably faster in countries with more competitive banking systems. This result holds even when they account for cross-country differences in institutional quality. In a similar study, Cetorelli and Strahan (2006) use Herfindahl-

Hirschman indexes as the competition measure, and their dependent variables are the number of firms, firm size or a measure of size distribution. Although their competition variable is suspect of endogeneity, they find a significant positive effect of lower bank concentration on small firm growth in the United States. Bertrand et al. (2007) analyse a large French firm-level dataset and find that market concentration decreased in more bank-dependent industries following banking sector deregulation in the mid-1980s.

We are aware of two papers analysing bank competition and economic performance in eastern Europe. Koivu (2002) estimates a fixed effects regression where banking sector development variables and macroeconomic controls explain economic growth. She finds that lower interest rate spreads (more intense competition) lead to faster GDP growth in transition countries in the 1990s. On the other hand, a rise in the amount of credit does not lead to better economic performance, possibly due to the numerous banking crises in the sample period. Botrić and Slijepčević (2008) perform a similar analysis on southeast European countries and confirm the positive effect of lower interest rate spreads on growth. However, these studies analyse macroeconomic aggregates and their bank competition variable (interest margins) may be endogenous.

3. METHODOLOGY AND DATA

Our methodology follows that of Claessens and Laeven (2005) as well as Cetorelli and Strahan (2006), who in turn adapt the framework from Rajan and Zingales (1998). We estimate the following model:

$$\begin{aligned} \text{Firm growth}_{j,k} &= \alpha + \mu_j + v_k + \\ &+ \psi_1 \cdot \text{Initial industry share in manufacturing value added}_{j,k} + \\ &+ \psi_2 \cdot \text{Financial dependence}_j \cdot \text{Competition index}_k + \varepsilon_{j,k} \end{aligned}$$

where j and k are industry and country indexes. The fixed effects (μ_j and v_k) control for any unobserved industry- or country-specific heterogeneity, while the initial industry share controls real convergence: industries with low shares are expected to grow faster than others. Our dependent variable is the growth rate of the number of firms, a measure of net firm entry. This is motivated by theoretical as well as practical considerations. On the theoretical side, we

believe that the number of firms is a useful indicator for economic development. Firm growth reflects entrepreneurship and is expected to foster competition and innovation. In all, net entry can account for 20 to 40% of labour productivity growth according to the OECD (2004, chapter 4). On the practical side, the number of firms is available for EU member states at the 3-digit disaggregation level at Eurostat, whereas real value added data are patchy. Therefore our sample can cover a wider range of countries and industries.

These data were obtained from Eurostat at the 3-digit NACE (Rev. 1.1) level. Our database contains 28 European countries and 101 industries, which allows a theoretical maximum of 2828 observations. Missing observations limit our sample to 2405 elements in our regressions. Industry shares in manufacturing were calculated from annual value added data.

Industry-level external financing dependence was taken from Rajan and Zingales (1998) at 3-digit level by the ISIC Rev. 2 classification; these were translated into NACE. Rajan and Zingales calculate dependence indicators for U.S. manufacturing industries in the 1980s using data of publicly traded, relatively large firms in Standard and Poor's Compustat database. Firms' dependence on external finance is defined as capital expenditures minus cash flow from operations divided by capital expenditures. They argue that this measure is an appropriate proxy of external finance dependence worldwide, for various reasons. First, these large publicly traded firms typically face no significant obstacles accessing finance. Second, the external finance used by U.S. firms is expected to be a good proxy of the desired amount of financing firms in other countries with less developed financial markets. Third, in a steady-state equilibrium there is no need for external financing, therefore much of the demand for external finance is connected with technological shocks, which should be identical across countries. Fourth, their results are robust to dependences measures in the 1970s meaning that the different product life cycle position of firms in different countries does not introduce bias. Finally, measurement issues (including a possibly imperfect matching of different classifications) introduce a bias against finding a significant relationship between the interaction term and the dependent variable.

We consider various measures of bank competition. We use a time-varying H-statistic for the banking sector, as calculated by Bikker and Spierdijk (2008). We complement the analysis with institutional variables that characterise the legal structure and property rights, state ownership of banks, foreign bank entry restrictions and credit regulations. These are obtained

from the Fraser Institute; see Gwartney et al. (2008) for their detailed description. We hope to gain more insights on the sources of bank competition by using these variables. We also use a standard measure of financial development, the ratio of private sector loans to GDP. Since most European countries have bank-based financial systems, we believe that focusing on bank financing will not distort our results.

Variable definitions, data sources and descriptive statistics are presented in Table 1, while a comparison of new EU members and the rest of the sample (old EU members plus Norway) is provided in Table 2. The 2006 values of key explanatory variables are illustrated in Charts 1-6 to give insight on the relative strengths and weaknesses of individual countries' institutional frameworks.

The real convergence process of the new EU members is apparent in terms of the number of firms (5% compound average growth versus 1.1% in western Europe). However, their banking sector is less developed with private sector credit averaging 45.5% compared to 98.9% in western Europe. Moreover, their institutional characteristics are less favourable and their banking sectors are somewhat less competitive as measured by the H-statistic (0.355 versus 0.481). Finally, the average external finance dependence of manufacturing (aggregated from sector-level figures) is visibly lower in the new EU members (0.318 versus 0.365). This suggests that less favourable financing conditions set back the development of financing-intensive industries.

4. RESULTS

4.1. Baseline results

We estimate the effect of banking competition on firm growth, where the effect is allowed to vary with the external finance dependence of the industry. Bank competition is measured in multiple ways. As the correlation matrix of the main variables reveals (Table 3), competition measures are highly correlated. To avoid multicollinearity we include them in our regressions one at a time. Table 4 summarises the results of our regressions. The initial share of the sector has a significant negative effect on firm growth in the following years, indicating convergence across economic sectors and countries. The coefficients of the interaction variables are

positive. However, financial depth, state ownership of banks and credit regulations are not significant. Bank competition and foreign bank entry are weakly significant (at 10%), while the legal structure is the most robust institutional variable.

As a simple illustration of the economic relevance of bank competition, consider that $H=1$ with perfect competition and $H \leq 0$ with monopoly. Therefore a shift from a monopolistic banking sector to perfect competition could raise net firm entry in the industry with average external finance dependence (0.351) by at least $(1-0) \cdot 0.351 \cdot 100 = 0.91$ percentage points, a considerable magnitude.

We also report three difference-in-difference measures to explore further the relevance of the estimated coefficients. Rajan and Zingales (1998) proposed the difference between the growth rates of industries at the 25th and 75th percentiles of external dependence in countries at the 25th and 75th percentiles of financial development. For example, Italy is at the 25th percentile of the distribution of H-statistics, while Switzerland is at the 75th percentile. Similarly, the manufacture of dairy products is at the 25th percentile of external finance dependence and the manufacture of pharmaceuticals is at the 75th. The table shows that in Switzerland the growth in the number of firms in the pharmaceuticals industry exceeds that in the dairy industry by 0.54% more than in Italy due to the higher competitiveness of the Swiss banking sector. This differential impact of the three significant variables – bank competition, legal environment and foreign banks – is similar at around 0.54-0.6 percentage points. For comparison, Rajan and Zingales (1998, Table 8) report a 0.4-0.7 percentage point growth differential in the number of firms due to higher financial development, while Claessens and Laeven (2005) calculate a 1.2 percentage point impact of the H-statistic on value added growth.

The second measure compares new EU members with the rest of the sample. It shows that lower bank competition alone reduces the growth of manufacturing firms by 0.16 percentage points relative to the other countries – in other words, a more competitive financial sector could have spurred firm growth even further. The impact of differences in legal environment and foreign bank competition is even larger, the former reaching almost a full percentage point. These findings suggest that the potential gains from improvements in the institutional framework remain significant.

Finally, we assess how the situation of the new EU members improved by comparing their 2006 and 1995 values. Although bank competition (measured by the H-statistic) increased, this only added 0.08 percentage points to firm growth in manufacturing. Much more was gained through bank privatisation, foreign bank entry and less restrictive credit regulations.

4.2. Robustness checks

We perform a robustness check by introducing financial development and institutional variables besides the H-statistic in our regressions, using interactions with external finance dependence in all cases (Table 5). If the coefficient of the interacted H-statistic becomes insignificant, we can interpret it as evidence that the recently introduced institutional variable is an important underlying factor behind the level of bank competition. It turns out that the legal structure and the security of property rights is a key determinant of bank competition. There is also some evidence that foreign banks entry affects the evolution of the H-statistic, although its parameter value does not change greatly. When controlling for the depth of bank intermediation the H-statistic again loses its significance but the size of the parameter remains unchanged. Finally, there is no evidence that the state ownership of banks or credit regulations affect the H-statistic. This might be explained by the fact that by 1995 (the beginning of our sample) bank privatisation was already well under way in most new EU members. The effect of state ownership and credit regulations may have been more pronounced in earlier years of transition.

4.3. Policy implications

We find a statistically and economically significant impact of bank competition and institutional framework on firm growth in Europe over the 1995-2006 period. New EU members experience faster firm growth as part of their real convergence process, potentially leading to a higher degree of product market competition and more innovations. However, the beneficial effects of firm entry could be improved through structural reforms in these countries. In particular, legal structure and property rights seem to influence economic outcomes through the financial system. The findings of Bikker and Spierdijk (2008) suggest that a low degree of bank competition remains an issue for example in Cyprus, Estonia,

Poland, Slovenia and Slovakia (Chart 2). According to the Fraser Institute (Gwartney et al., 2008, Charts 3-6), the legal structure and property rights remain below the EU standard in a number of countries including the Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia.^d Credit regulations may still hold back financial sector development in Romania. On the other hand, differences in the state ownership of banks and foreign bank entry restrictions are not significant, so their impact on economic outcomes may be less pronounced.

As a consequence of the ongoing financial crisis and its particular impact on the new EU members, calls for the re-regulation of the financial sector are multiplying. The results of this paper remind us of the benefits of bank competition which should not be stifled by new regulations. It also draws attention to the importance of sound institutions for financial sector development and economic growth.

5. CONCLUSIONS

Bank competition can encourage financial institutions to lend to more firms, facilitating firm entry and the development of SMEs. This in turn should stimulate product market competition and innovation. We examined this hypothesis in a sample of European manufacturing industries over the 1995-2006 period; the novelty of our paper is the inclusion of new EU members in the analysis. We took into consideration industry differences in the need for external finance. In line with earlier literature we found that bank competition helps firm entry. Furthermore, better institutions – in particular, legal structure and property rights – also have a positive impact, through a better functioning financial system. Based on our results we argued that new EU members could improve their outcomes through the enforcement of bank competition and institutional reforms. We also argued that the re-regulation of financial systems after the financial crisis should not stifle bank competition to preserve its beneficial effects on economic performance.

^d Our analysis excludes Bulgaria but similar points could be raised in its case.

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TABLES AND FIGURES
Table 1. Data definitions and descriptive statistics

Variable	Source	No. of obs.	Mean	S.D.	Min.	Max.
Growth of number of firms, average 1995-2006	Eurostat	2628	0.027	0.089	-0.693	1.634
Initial industry share in manufacturing value added, 1995	Eurostat	2582	0.010	0.016	0.000	0.207
External finance dependence	Authors' calculations based on Rajan and Zingales (1998)	2884	0.351	0.272	-0.450	1.207
Private sector loans / GDP, average 1995-2006	IFS, authors' calculations	2781	0.791	0.416	0.117	1.611
Legal structure and security of property rights, average 1995-2006	Fraser Institute (Gwartney et al, 2008)	2781	7.591	1.252	5.333	9.283
State ownership of banks, average 1995-2006	Fraser Institute (Gwartney et al, 2008)	2781	7.910	1.998	2.750	10.000
Foreign bank competition, average 1995-2006	Fraser Institute (Gwartney et al, 2008)	2781	7.267	0.875	5.767	9.540
Credit regulations, average 1995- 2006	Fraser Institute (Gwartney et al, 2008)	2781	7.988	0.991	4.931	9.323
H-statistic, average 1995-2006	Authors' calculations based on Bikker and Spierdijk (2008)	2781	0.434	0.371	-0.177	1.212

Table 2. Differences between New Member States and the rest of the sample

Variable	NMS		Other	
	Mean	S.D.	Mean	S.D.
Average growth of number of firms, 1995-2006	0.050	0.113	0.011	0.063
External finance dependence of manufacturing	0.318	0.046	0.365	0.040
Average H-statistic, 1995-2006	0.355	0.267	0.481	0.412
Legal structure and security of property rights	6.340	0.486	8.328	0.941
State ownership of banks	6.992	1.938	8.451	1.829
Foreign bank competition	6.803	0.668	7.540	0.868
Credit regulations	7.216	0.981	8.441	0.661
Private sector loans / GDP, average 1995-2006	0.455	0.386	0.989	0.285

Note: New Member States in our sample are Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The rest of the sample consists of the EU15 countries, Norway and Switzerland.

Table 3. Correlation matrix of regressors

	Number of firms	H * dependence	Loans/GDP * dependence	Legal structure * dependence	Ownership * dependence	Foreign banks * dependence	Credit regulations * dependence	Initial industry share
Number of firms	1.000							
H * dependence	0.021	1.000						
Loans/GDP * dependence	-0.065	0.503	1.000					
Legal structure * dependence	0.048	0.557	0.847	1.000				
Ownership * dependence	0.077	0.537	0.786	0.939	1.000			
Foreign banks * dependence	0.072	0.570	0.802	0.978	0.923	1.000		
Credit regulations * dependence	0.068	0.542	0.832	0.988	0.964	0.983	1.000	
Initial industry share	-0.045	-0.038	-0.025	-0.049	-0.047	-0.053	-0.052	1.000

Table 4. Estimation results*Dependent variable: Growth in the number of firms. OLS with robust standard errors*

	1. Financial deepening	2. Bank competition	3. Legal environment	4. State- owned banks	5. Foreign bank entry	6. Credit regulations
Initial industry share	-0.348 *** (0.111)	-0.350 *** (0.110)	-0.367 *** (0.111)	-0.351 *** (0.110)	-0.350 *** (0.110)	-0.354 *** (0.112)
Loans/GDP * dependence	0.007 (0.019)	-	-	-	-	-
H-statistic * dependence	-	0.026 * (0.015)	-	-	-	-
Legal structure * dependence	-	-	0.009 ** (0.004)	-	-	-
State ownership * dependence	-	-	-	0.003 (0.002)	-	-
Foreign banks * dependence	-	-	-	-	0.012 * (0.007)	-
Credit regulations * dependence	-	-	-	-	-	0.005 (0.005)
R ²	0.374	0.375	0.375	0.374	0.375	0.374
DID 25-75 percentiles (%)	0.14	0.54	0.61	0.24	0.55	0.23
DID NMS vs rest of sample, manufacturing average	-0.15	-0.16	-0.92	-0.26	-0.71	-0.39
DID NMS 2006 vs 1995, manufacturing average	0.09	0.08	0.24	0.43	1.29	0.76

*Note: robust standard errors in parentheses, parameters are significant at * 10%, ** 5%, *** 1%. Number of countries = 26, number of industries = 101, number of observations = 2405 in all regressions.*

Table 5. Robustness check – paired institutional variables*Dependent variable: Growth in the number of firms. OLS with robust standard errors*

Initial industry share	-0.351 *** (0.111)	-0.369 *** (0.111)	-0.354 *** (0.110)	-0.353 *** (0.110)	-0.357 *** (0.113)
Loans/GDP * dependence	-0.003 (0.020)	-	-	-	-
H-statistic * dependence	0.026 (0.017)	-0.024 (0.015)	0.025 * (0.015)	0.023 (0.016)	0.027 * (0.015)
Legal structure * dependence	-	0.009 ** (0.004)	-	-	-
State ownership * dependence	-	-	0.002 (0.002)	-	-
Foreign banks * dependence	-	-	-	0.011 (0.007)	-
Credit regulations * dependence	-	-	-	-	0.005 (0.005)
R ²	0.375	0.376	0.375	0.375	0.375

*Note: robust standard errors in parentheses, parameters are significant at * 10%, ** 5%, *** 1%. Number of countries = 26, number of industries = 101, number of observations = 2405 in all regressions.*

Chart 1. Private sector MFI loans / GDP in 2006

Source: IMF, own calculations.

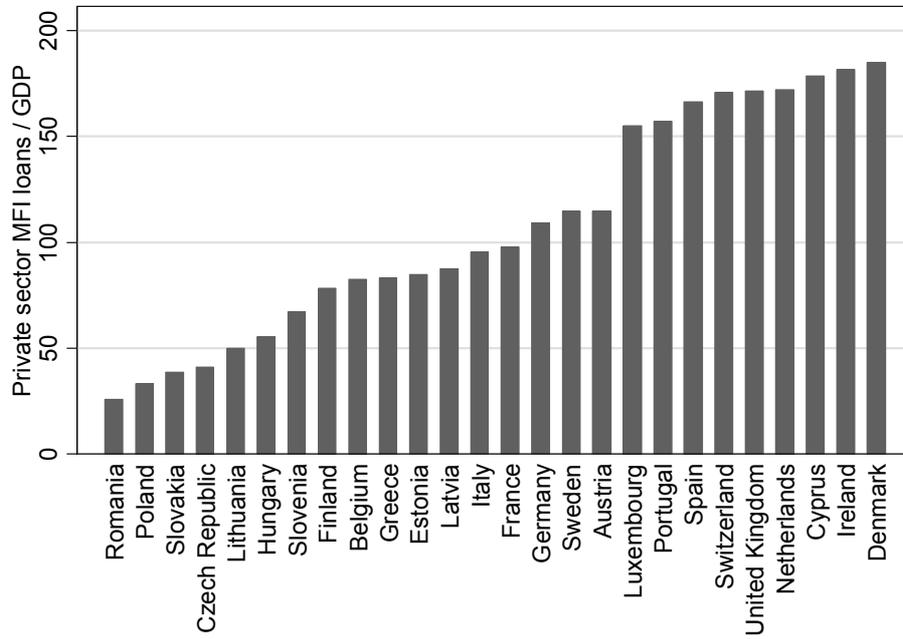


Chart 2. Banking sector H-statistics in 2006

Source: Bikker and Spierdijk (2008).

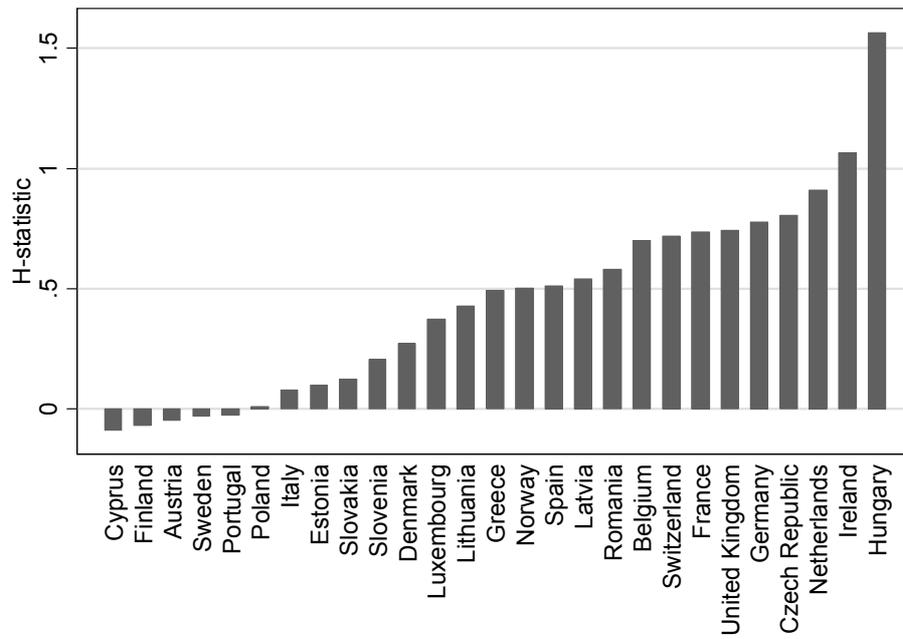


Chart 3. Legal structure and security of property rights in 2006

Note: higher values indicate more stable legal structure and better protection of property rights.

Source: Gwartney et al. (2008).

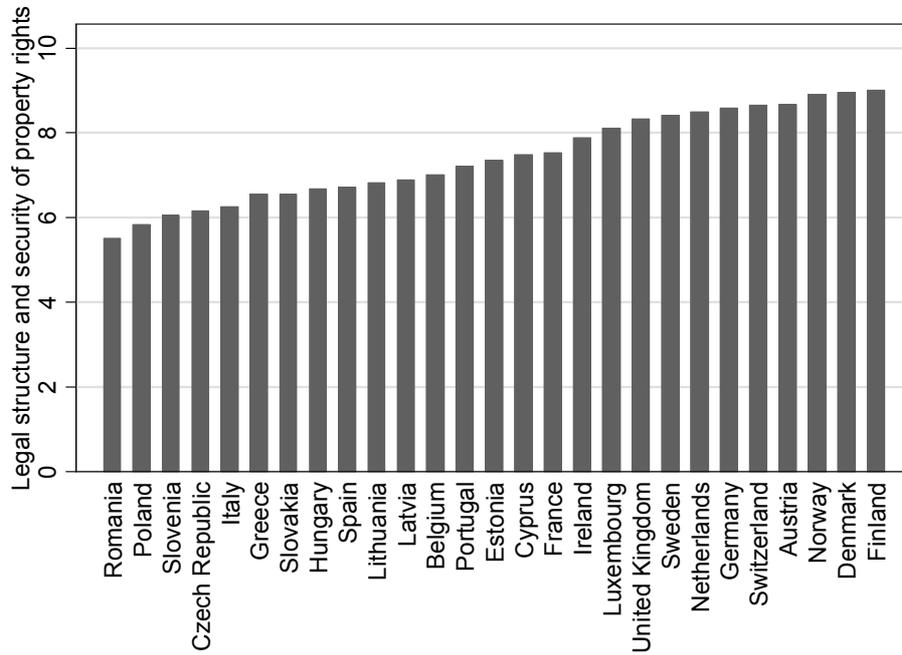


Chart 4. State ownership of banks in 2006

Note: lower values indicate higher state ownership. Source: Gwartney et al. (2008).

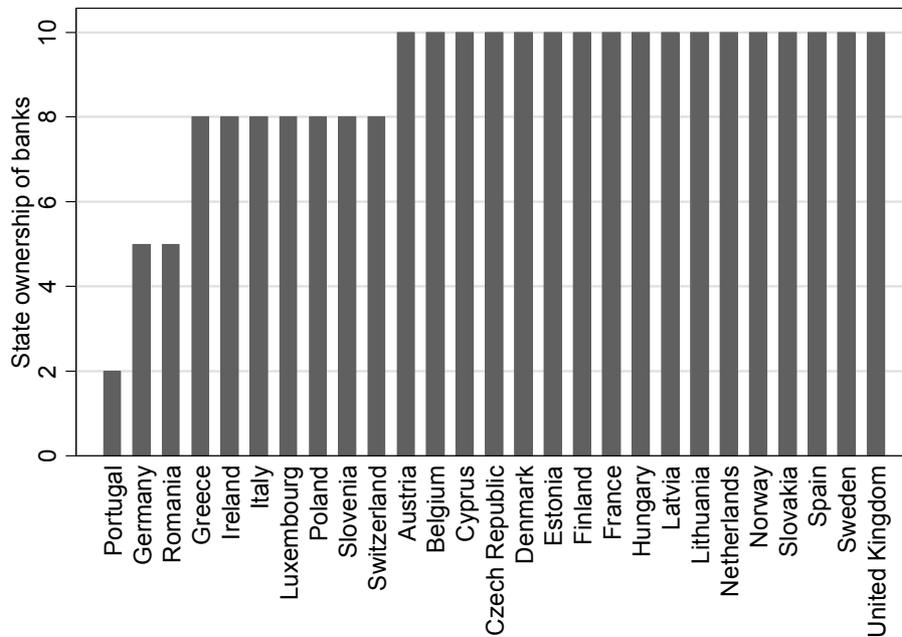


Chart 5. Foreign bank entry in 2006

Note: higher values indicate freer entry. Source: Gwartney et al. (2008).

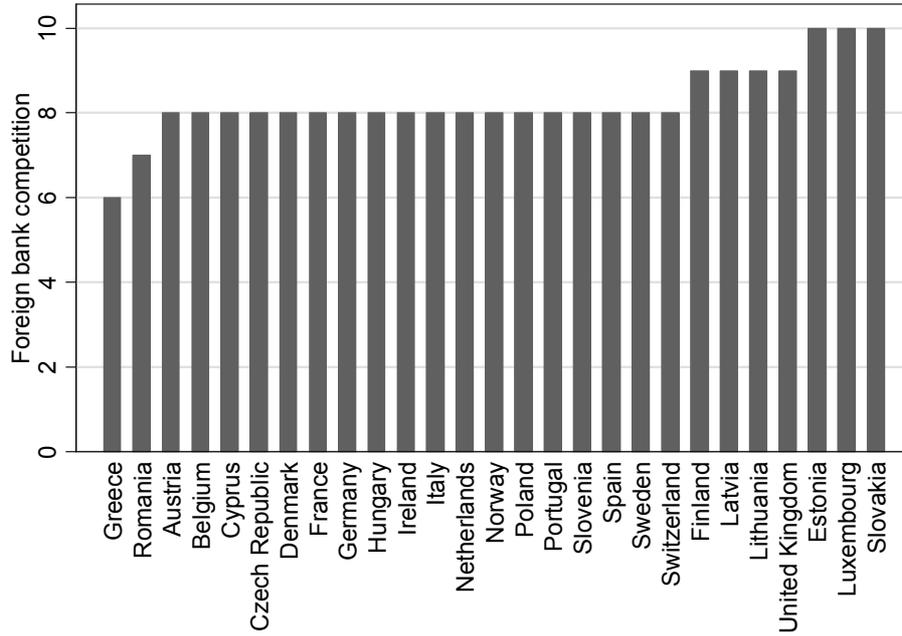


Chart 6. Credit market regulations in 2006

Note: higher values indicate less restrictions. Source: Gwartney et al. (2008).

