

THE EFFECT OF BANK CONCENTRATION ON ENTREPRENEURSHIP IN CENTRAL AND EASTERN EUROPEAN TRANSITION COUNTRIES.

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SOMMARIO

Il presente lavoro studia l'impatto della concentrazione bancaria sull'iniziativa imprenditoriale dei paesi in transizione del centro-est Europa, per il periodo 2000-2007.

I principali risultati evidenziano una relazione non monotonica fra la struttura del mercato bancario ed l'imprenditorialità. Difatti, la concentrazione bancaria promuove l'iniziativa imprenditoriale, ma un livello di concentrazione del mercato troppo elevato sortisce l'effetto contrario. Inoltre, tale effetto positivo si riduce sensibilmente per i settori industriali *high-technology-based*, mentre incrementa per le industrie *knowledge-based*.

L'iniziativa imprenditoriale è anche stimolata dai mercati finanziari ben sviluppati, dai governi di qualità, dalle politiche rivolte alla prevenzione della corruzione e dalla tutela effettiva dei diritti di proprietà intellettuale.

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The effect of Bank Concentration on Entrepreneurship in Central and Eastern European Transition Countries.

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Abstract

This paper sheds light on the impact of bank concentration on the entrepreneurial initiative in the Central and Eastern European transition countries over the period 2000-2007. Our investigation provides evidence of a bell-shaped relationship: bank concentration promotes entrepreneurship; however, too great a concentration becomes harmful. Further, the positive effect decreases for high-technology-based industries, whereas increases for knowledge-based industries. Entrepreneurship is also encouraged by well-developed financial markets, quality governments, policies to prevent corruption and effective property rights protection.

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1 Introduction

The role of financial systems in fostering economic growth has been explored since the beginning of the twentieth century. Schumpeter (1911) argues that financial intermediaries provide services that stimulate long-run growth, Goldsmith (1969) performs the first empirical study that shows the positive correlation between financial development and growth. Later, King and Levine (1993) demonstrate that “finance matters” by testing the Schumpeterian theory: a higher level of financial development boosts economic growth, capital accumulation and firms’ productivity. Specifically, well-developed financial systems are found to encourage industrial growth (Rajan and Zingales (1998)) and to promote firms’ entry in a market (Aghion et al. (2007)).

The related literature identifies two types of financial systems: market-based and bank-based systems. In the former type, the investment decisions are market driven, thus resource allocation should always be efficient, implying that the interest rate charged is that which prevails on the market, exactly rewarding the investor for the risk assumed. In the latter type, a cooperation between lenders and borrowers takes place: the investment decisions are based on the expected long-run capacity of firms to repay the debt, entailing that firms share their profits with banks by paying a higher interest rate when their financial situation is good, in return for a lower interest rate during the start-up or financial distress phases. On the one hand, the lender-borrower cooperation makes sure that banks closely care about firms; on the other hand, disregarding the market signals should lead to grant funding to firms that are not able to create the greatest value¹.

These brief considerations highlight the relevance of banking in stimulating economic growth. A debated issue in the specialised literature regards the effects that banking market structure has on industrial growth. This paper contributes to the existing literature by shedding light on the role that banking market structure plays on the entrepreneurial initiative in Central and Eastern European countries, the so-called transition economies. Actually, competition in the banking sector affects the credit supply, thus in countries where banks represent the major source of finance, the availability of credit is fundamental for the creation of new firms. In Central and Eastern European countries the bank-based system prevails, the credit market is concentrated and the entrepreneurial initiative, especially in innovative, technology-based sectors, is lagging. In addition, financial markets are not well developed, notwithstanding their proximity to the most developed area of the European

¹Levine (2002) finds no empirical evidence in favor of the bank-based or in favor of the market-based system. Instead, the level of financial development and the quality of financial services provided by intermediaries is what promotes the long-run growth. Beck and Levine (2002) corroborates Levine (2002) showing no evidence even for industries more dependent on external funding.

Union. Firms must rely mainly on banking credit to start their businesses; therefore, the banking market structure and the consequent quantity of credit supplied have a great importance. Furthermore, Central and Eastern European countries are passing from a planned to a market-oriented economy and are still in the process of restructuring their financial systems. As Bonin and Wachtel (2003) observe, before the transition process began, the only financial institutions were banks, mere extensions of the governments, granting funding to state-owned firms with no risk evaluation. The transition process started in the early nineties; the banking reform concerns the creation of the Central Bank, in charge of the monetary policy, and commercial banks, initially state-owned and thereafter gradually privatised to serve the functions of modern banks. For all these reasons, it might be useful for policy design to capture the effect of bank concentration on the entrepreneurial initiative in this phase of changes. Several contributions explore the effect of bank concentration on industrial growth on a world-wide scale, giving no emphasis to differences that can occur due to the varying socio-economic and institutional context. We explicitly account for the regulatory environment and the socio-economic context, testing, among other things, what the net effect of bank concentration when economies move from planned to market-oriented systems.

Moreover, on a technical level, we propose an original instrumental variable, designed to address the issue of endogeneity of banking market structure.

In the following section we survey the literature; in section 3 we present the empirical strategy and in section 4 we provide information about the data and the construction of the variables. In section 5 we show and discuss the empirical findings and in the last section we draw some tentative conclusions.

2 Literature review

In the last decade, the literature has explored the relation between banking market structure and industries' performances. There are mainly two theoretical approaches debated². The traditional theory of industrial organisation provides arguments in favour of banking competition. In a competitive environment banks are price takers, minimizing costs and supplying the maximum quantity of credit at the lowest interest rate. When banks acquire market power, they become able to set prices higher than marginal cost and supply less credit. Hence, concentrated banking markets have a detrimental effect on the whole industry. The alternative approach claims that the banking industry plays a role that makes it different from non-financial industries: among other things, banks provide financial services necessary

²Northcott (2004) does an extensive review on this issue and provides valuable elements to compare the alternative approaches, some of which are discussed above.

for firms to conduct their business. However, the amount of financial resources supplied is related not only to the market structure but also to some internal factors: a profitable bank can provide more credit and sturdier lending relationships in the event of financial crises. Therefore, yielding some degree of market power with the aim to preserve banking sector stability does not necessarily have a negative effect on the other industrial sectors. Taking a middle position, Cetorelli and Peretto (2000) illustrate that the banking market structure growth is the oligopoly: when the number of banks in a given market decreases, firms are better selected and credit is granted to high-quality borrowers, even though the overall quantity of credit supplied decreases.

On the empirical side, Petersen and Rajan (1995) prove that if the credit market is concentrated, the growth opportunities of young firms are greater. Usually young firms are riskier and unable to sustain high interest rates. Creditors in concentrated markets are assured of sharing future profits with firms and thus accept lower interest rates in the start-up phase. However, Cetorelli and Gambera (2001), testing the effect of banking market structure on industrial growth, show a general detrimental impact but, also, an industry-specific beneficial impact, corroborated by Claessens and Laeven (2005): bank concentration promotes the growth of industries more dependent on external funding and stimulates growth of younger firms to a greater extent³. Deidda and Fattouh (2005) find out that bank concentration hurts the industrial growth of low-income countries. This negative effect does not involve high-income countries, suggesting that well-developed financial markets, being an effective alternative source of funds, exert a competitive pressure on banks.

Bonaccorsi di Patti and dell'Arriccia (2004) illustrate a bell-shaped relation between banking market power and firm creation in Italy: bank concentration boosts the creation of new firms but too much concentration becomes harmful. The effect is heterogeneous across industries characterized by different degrees of asymmetric information: banking competition enhances the growth of more transparent industries. On a similar issue Ratti et al. (2008) observe that when bank concentration increases, the credit constraints decrease for firms in less opaque industries. Finally Pellényi and Borkó (2009) underline that banking competition in the enlarged European market has a positive impact on the number of more financially dependent firms.

Some contributions explore the ease of access to credit market. Bonaccorsi di Patti and Gobbi (2001) show a negative impact of bank concentration on the volume of credit for small and medium-sized firms. As well, Berger et al. (2001) find a positive impact of new banks' entry on small business lending. Consistently, Beck et al. (2004) illustrate that

³Cetorelli (2001) develops Cetorelli and Gambera (2001) and examines the effect of banking market structure on the market structure of the other industrial sectors. Bank concentration leads to concentration in other industries, especially in sectors highly dependent on external finance.

firms, especially the smaller ones, find barriers to obtain credit in more concentrated banking markets. However, these barriers are lower in countries characterized by less corruption and efficient legal systems and disappear in countries with well-developed financial markets. Cetorelli and Strahan (2006) support these findings: in order to keep their borrowers highly profitable, banks with market power create financial barriers to firms' entry. Yongjin (2008) also notes that in more concentrated banking sectors, the quantity of loans made available to small firms falls.

With regard to banking in transition economies, Schnitzer (1999a) illustrates that banking competition fosters industrial improvement if the cost of screening firms is not too high and, thus, profits with screening are higher than profits without screening. To obtain credit, firms are induced to restructure and required to have good performances⁴. Hainz (2003) suggests that promoting banking competition is the right policy because banks with market power require higher guarantees and interest rates in order to extract rents, thus harming the social welfare. Finally, Brown and Maurer (2005) show a non-linear relation between competition among banks caused by the liberalization of the financial sectors and credit access for small firms: an intermediate level of competition tends to maximize the quantity of credit, whereas too much competition becomes damaging. Further, foreign banks' entry increases the quantity of credit available for large firms while comparatively decreasing the quantity for small firms.

3 Empirical strategy

The empirical strategy follows the prevailing approach in the literature. The model we estimate is:

$$\begin{aligned} Entrepreneurship_{jk} = & \beta_0 + \theta_1 Industry\ Dummies_j + \theta_2 Control\ Variables_k \\ & + \beta_3 Bank\ Concentration_k + \beta_4 Bank\ Concentration_k^2 \\ & + \beta_5 (Bank\ Concentration_k * Interaction\ Term_{jk}) + \varepsilon_{jk} \end{aligned} \quad (1)$$

where index j refers to industry, k to country and ε is the error term.

The dependent variable *Entrepreneurship* is the average annual growth rate in the number of firms of industry j in country k for the period 2000-2007. By taking the average for the

⁴However, Schnitzer (1999b) reveals a downside. The restructuring generates positive externalities by affecting the profitability of the banking sector, which also benefits non-restructuring firms, even though few firms do it. Therefore firms are prone to take advantage without incurring the costs, leaving the restructuring to the other firms.

period, we remove the effect of temporary shocks⁵. *Industry Dummies* is the set of dummies capturing the industry-specific effects.

Bank Concentration is the average 5-Bank Concentration Ratio⁶ over the period analysed. We include the square of *Bank Concentration* to account for the potential non-linear relationship between bank concentration and firm creation⁷.

Further, we add to the model the interaction of *Bank Concentration* with the following dummy variables, to test whether the impact of banking market structure on the entrepreneurial initiative increases or reduces for sectors with different characteristics⁸:

- *High-Technology-Intensive Sectors* (HTIS) is a dummy equal to 1 for high-technology-based sectors, 0 otherwise;
- *Knowledge-Intensive Sectors* (KIS) is a dummy equal to 1 for knowledge-based sectors, 0 otherwise.

One might argue that the variable *Bank Concentration* could be endogenous leading to biased OLS estimates. Indeed, Cetorelli and Gambera (2001) highlight that banking market structure “adjusts to a level that is optimal for a country’s industrial structure” although other political and institutional factors influence the financial system’s structure. Moreover, Bonaccorsi di Patti and dell’Ariccia (2004) underline that banking market structure “has an endogenous component insofar as that banks move into more dynamic economies with higher rates of firms creation”.

Sharing these arguments, we implement the 2SLS estimator. We consider two instruments: *Rule of Law* and *Banking Applications*. The first one is widely adopted in the literature and measures the legislative enforcement; the second one is an original concept by the

⁵The cross-sectional estimation was conceived by Rajan and Zingales (1998) to analysis the role of financial markets in promoting industrial growth. Afterward, their model was revisited by Cetorelli and Gambera (2001), Claessens and Laeven (2005) to explore the impact of banking market structure on industrial growth, and by Bonaccorsi di Patti and dell’Ariccia (2004) to explore the impact of banking market structure on firm creation.

⁶Cetorelli and Gambera (2001) use the 3-Bank Concentration Ratio and the 5-Bank concentration Ratio reaching the same results. Cetorelli (2001), Beck et al. (2004), Deidda and Fattouh (2005) and Ratti et al. (2008) adopt the same measure. Claessens and Laeven (2005) implement, in addition, the H-statistics: the sum of the elasticities of the total revenue of the banks with respect to the bank’s input prices. Bonaccorsi di Patti and dell’Ariccia (2004) employ, among others, the Herfindahl index of deposits and the share of deposits held by locally chartered banks.

⁷See Bonaccorsi di Patti and dell’Ariccia (2004).

⁸Some contributions explored differences across industries by focusing on the level dependence on external funding, using, mainly, the proxy developed by Rajan and Zingales (1998). Demand for funding is related to the technological intensity of a given industry that is supposed not to vary with countries and to be stable over the years. We do not employ this proxy because, to the best of our knowledge, the most recent data on external financial dependence (Klapper et al (2004)) cover the decade 1990-99, whereas our analysis relates to the following years. Technological developments happen so quickly the data should no longer reflect the average level of the previous decade.

authors, defined as the ratio of accepted applications to applications sent to the competent authorities to exercise banking activity in 2000. 2000 is used on the assumption that entering the market today produces its effect in the following years since, after entry, banks need time to perform their functions to the fullest. This instrument is meaningful: it captures entry into the banking market but it is not simultaneously determined with the dependent variables since the necessary legal requirements to operate as a bank are settled on by authorities in each country and, once defined, are stable and cannot be influenced by the growth rate in the number of firms.

We compute the instruments according to the endogenous variables. For each regression estimated, we perform several tests to assess the non-weakness and the validity of the instruments employed.

4 Data description and variables construction

Data on number of firms come from Structural Business Statistics (SBS) developed by Eurostat and are classified according to the *Nomenclature statistique des Activités économiques dans la Communauté Européenne* (NACE) Rev. 1.1. Among Central and Eastern European countries, data are available for Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. We employ data from 1999 to 2007 in order to compute the 2000-2007 average growth rate in number of firms for:

- Mining and quarrying (C);
- Manufacturing (D);
- Electricity, gas and water supply (E);
- Construction (F);
- Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods (G);
- Hotels and restaurants (H);
- Transport, storage and communication (I);
- Real estate, renting and business activities (K).

Previous contributions focus their analysis on manufacturing; we extend the analysis to other sectors whose data are available in SBS.

We employ, mainly, data on industries at 3-digit level of disaggregation. However, if observations are missing at this level, we move to the 2-digit level, less disaggregated. We end up with 1439 country-industry observations. For the sake of convenience, in Table 1 (in Appedix) we provide the 2-digit level NACE classification to specify which industrial sectors are included in our analysis. High-technology-intensive sectors are those identified by codes 24, 29, 30, 31, 32, 33, 34, 35 (excluding 35.1), whereas knowledge-intensive sectors are those identified by codes 61, 62, 64, 70 to 74⁹.

The European Banking Structure annual report of the European Central Bank provides the 5-Bank concentration Ratio, available from 2001 for Central and Eastern European countries (Table 2 in Appendix). The data show that bank concentration is higher for transition economies along the six-year period compared to the rest of Europe. For the whole Europe, the average 5-Bank concentration Ratio is 59%, while for transition countries the average is 6.8 points higher and for the other European countries it is 4.1 points less. To be specific, Estonia and Lithuania show the highest level of bank concentration, 98.1% and 82.2% respectively, while Poland (50.2%) and Bulgaria (52.5%) have the lowest averages among transition countries.

In Table 3 (in Appendix) we provide a summary description of all the variables included in our analysis together with the indication of the related sources. Finally, in Table 4 (in Appendix) we provide the descriptive statistics of our sample.

5 Results

As shown in Table 5, *Bank Concentration* has a positive and highly significant impact on entrepreneurship, while the *Bank Concentration*² has a negative and highly significant impact, with robust coefficient estimates across regressions. The relationship between concentration in the banking sector and entrepreneurship in Central and Eastern European countries appears to be bell-shaped: bank concentration promotes entrepreneurship but too great a concentration hinders it¹⁰. We estimate that the maximum value of 5-Bank Concentration ratio that still promote firm creation is, roughly, 0.60. In other words, the five largest banks should hold, all together, a market share up to this value, otherwise concentration becomes harmful for entrepreneurship¹¹.

⁹A detailed list can be found in Eurostat publication “NACE Rev. 1 Statistical classification of economic activities in the European Community” downloadable from <http://bookshop.europa.eu/en/nace-rev-1-pbCA8093436/>.

¹⁰Consistently with Bonaccorsi di Patti and dell’Ariccia (2004).

¹¹This threshold is estimated from regressions with all control variables (reported in column 7 to 9).

Table 5. The Effect of Bank Concentration on Entrepreneurship.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Bank Concentration</i>	6.756*** (1.105)	6.912*** (1.107)	6.616*** (1.106)	6.567*** (0.923)	6.722*** (0.929)	6.427*** (0.920)	6.318*** (0.795)	6.465*** (0.803)	6.195*** (0.790)
<i>Bank Concentration</i> ²	-3.857*** (0.800)	-3.862*** (0.802)	-3.840*** (0.802)	-4.303*** (0.610)	-4.309*** (0.612)	-4.287*** (0.611)	-5.470*** (0.549)	-5.476*** (0.551)	-5.456*** (0.549)
<i>Bank Concentration*HTIS</i>		-0.657*** (0.168)			-0.637*** (0.166)			-0.608*** (0.156)	
<i>Bank Concentration*KIS</i>			1.257*** (0.547)			1.216*** (0.536)			1.129*** (0.474)
<i>Initial Share of Industry</i>	-0.075 (1.117)	-0.062 (1.125)	-0.163 (1.122)	-0.193 (1.046)	-0.181 (1.053)	-0.280 (1.052)	-0.697 (0.843)	-0.686 (0.849)	-0.776 (0.853)
<i>Log(GDP)</i>	-0.459*** (0.052)	-0.460*** (0.052)	-0.463*** (0.052)	-0.606*** (0.063)	-0.607*** (0.063)	-0.612*** (0.063)	-1.238*** (0.107)	-1.239*** (0.107)	-1.242*** (0.108)
<i>Financial Development</i>	1.205*** (0.162)	1.208*** (0.162)	1.217*** (0.163)	0.931*** (0.150)	0.935*** (0.150)	0.940*** (0.151)	0.124 (0.086)	0.128 (0.086)	0.135 (0.087)
<i>Government Effectiveness</i>				0.450*** (0.080)	0.448*** (0.079)	0.454*** (0.080)	2.664*** (0.245)	2.663*** (0.246)	2.661*** (0.248)
<i>Activity Regulation</i>							0.913*** (0.089)	0.913*** (0.089)	0.911*** (0.090)
Cragg-Donald statistic	224.945	81.272	83.705	231.467	81.278	83.723	3593.865	81.139	83.646
Stock-Yogo critical values	11.04	12.20	12.20	11.04	12.20	12.20	11.04	12.20	12.20
Hansen J statistic	6.604	7.789	10.252	1.113	1.373	2.286	6.532	7.050	9.214
Hansen J p-value	0.037	0.051	0.017	0.573	0.712	0.515	0.038	0.070	0.027
Observations	1439	1439	1439	1439	1439	1439	1439	1439	1439
R ²	0.042	0.033	0.025	0.159	0.150	0.143	0.337	0.329	0.322

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Industry dummies are included but not reported.

In light of this, banks in Central and Eastern European countries seem to be more willing to finance start-up firms when bank concentration increases. As Petersen and Rajan (1995) claim, start-up firms are risky and not able to pay high interest rates to obtain the credit needed to undertake their business. In more concentrated markets, banks are more likely to finance start-up firms and to accept, at first, lower returns because the market power allows them easily to extract future profits from successful firms, thus being rewarded later for the risk assumed. Moreover, the market power gives incentive to banks to engage in a more accurate screening activity because the returns of new financed projects have a straight impact on their future profits (see Cetorelli and Gambera (2000)). Therefore, credit should be allocated to that firms able to create the greatest value.

The interaction term *Bank Concentration**HTIS is negative and significant; conversely, *Bank Concentration**KIS is positive and significant. The positive effect of *Bank Concentration* is weaker for high-technology-based sectors, while stronger for knowledge-based sectors.

As said before, banks tend to grant credit to projects that could have higher future returns. It is well known that investing in high-technological industries is riskier and requires a greater funding. Generally, banks are reluctant in investing in such projects, in particular when concerning small firms (World Bank (2005)). Therefore, it is expectable that the positive effect of concentration in the banking sector softens for high-tech industries. Differently, knowledge-based sectors take more advantage from bank concentration. In the last decade, knowledge-based firms have been successful in Central and Eastern European countries¹². Thus, this success might have induced banks to more likely undertake lending relationship with firms operating in these sectors.

These results recall the arguments put forth by Rajan and Zingales (2001), concerning the relationship between financial systems and industrial growth. Concentrated banking markets, which provide the bulk of funding to firms, work better when economies are at an early stage of development and, more generally, with traditional industries whose characteristics are well known and for which disregarding market signals might not have serious implications. In other words, more concentrated banking markets are suitable for financing physical-asset-intensive industry rather than high-technology, R&D-based industries. Generally physical-asset-intensive industries are traditional and well known, so the absence of market signals about their profitability does not cause problems in terms of investment decisions. When industries are intangible assets-based there is the need to improve transparency, thus bank-based systems should become more competitive and, therefore, market-oriented.

¹²Woodward et al (2011) analyse in detail the entrepreneurship in knowledge based sectors, depicting growth paths and success factors.

Regressions reported In table 6 shows that banking market structure variables are consistent with different specifications.

Table 6. The Effect of Bank Concentration on Entrepreneurship.			
	(1)	(2)	(3)
<i>Bank Concentration</i>	9.603*** (1.112)	9.767*** (1.127)	9.572*** (1.107)
<i>Bank Concentration</i> ²	-6.594*** (0.832)	-6.607*** (0.833)	-6.661*** (0.836)
<i>Bank Concentration*HTIS</i>		-0.649*** (0.174)	
<i>Bank Concentration*KIS</i>			1.240** (0.547)
<i>Initial Share of Industry</i>	-0.236 (1.042)	-0.224 (1.049)	-0.325 (1.048)
<i>Log(GDP)</i>	-0.579*** (0.090)	-0.581*** (0.089)	-0.591*** (0.090)
<i>Control of Corruption</i>	0.584*** (0.118)	0.588*** (0.118)	0.602*** (0.119)
<i>Property Rights</i>	0.012*** (0.002)	0.012*** (0.002)	0.012*** (0.002)
Cragg-Donald statistic	252.003	81.195	83.705
Stock-Yogo critical values	11.04	12.20	12.20
Hansen J statistic	4.493	4.369	5.893
Hansen J p-value	0.106	0.224	0.117
Observations	1439	1439	1439
R-squared	0.180	0.171	0.165

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Industry dummies are included but not reported.

Control variables have the expected signs. *Log(GDP)* is negative and significant, capturing the convergence among transition economies. *Initial Share of Industry* is negative, new firms are less likely to enter in crowded industries, although not statistically different from zero. *Financial Development* has positive and significant effects, underlying that well developed financial markets boost the creation of new firms¹³. *Government Effectiveness* has

¹³Consistent with Rajan and Zingales (1998) who showed that the growth in the number of establishments is fostered when financial markets are well developed.

a positive and significant impact, suggesting that high quality governments stimulate entrepreneurship. *Activity Restriction* has a positive and significant impact on firms creations: the lower the activities' diversification, the greater the amount of credit that banks can address to traditional banking activity. Moreover, *Control of Corruption* has a positive and significant impact, meaning that when governments enforce this control, they stimulate the firm creation process. The variable *Property Rights* is positive and significant: more effective property rights protection fosters entrepreneurship.

Afterward, we check the robustness of coefficient estimates by accounting for the banking capital structure¹⁴ (see Table 7 and 8).

¹⁴We include in the set of endogenous variables also the banking capital structure variables since they are built on banking assets as banking market structure variables.

Table 7. The Effect of Bank Concentration on Entrepreneurship.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Bank Concentration</i>	6.291*** (0.996)	6.448*** (0.999)	6.145*** (0.994)	6.108*** (0.694)	6.252*** (0.705)	5.973*** (0.687)
<i>Bank Concentration</i> ²	-3.671*** (0.746)	-3.677*** (0.747)	-3.652*** (0.747)	-5.294*** (0.494)	-5.297*** (0.496)	-5.271*** (0.493)
<i>Bank Concentration</i> * <i>HTIS</i>		-0.650*** (0.173)			-0.610*** (0.156)	
<i>Bank Concentration</i> * <i>KIS</i>			1.257** (0.551)			1.136** (0.475)
<i>Initial Share of Industry</i>	-0.081 (1.105)	-0.068 (1.113)	-0.170 (1.110)	-0.683 (0.839)	-0.671 (0.844)	-0.762 (0.849)
<i>Log(GDP)</i>	-0.428*** (0.053)	-0.429*** (0.053)	-0.432*** (0.053)	-1.160*** (0.153)	-1.160*** (0.153)	-1.160*** (0.154)
<i>Financial Development</i>	1.080*** (0.175)	1.084*** (0.175)	1.090*** (0.176)	0.096 (0.088)	0.099 (0.088)	0.105 (0.089)
<i>Government Owned-Bank</i>	-0.275** (0.112)	-0.273** (0.112)	-0.279** (0.111)	-0.388 (0.446)	-0.395 (0.445)	-0.408 (0.445)
<i>Government Effectiveness</i>				2.569*** (0.296)	2.567*** (0.296)	2.562*** (0.298)
<i>Activity Regulation</i>				1.018*** (0.134)	1.020*** (0.133)	1.022*** (0.133)
Cragg-Donald statistic	151.171	81.243	83.624	3108.038	81.133	83.618
Stock-Yogo critical values	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hansen J statistic	0.043	0.140	1.772	1.238	1.365	2.988
Hansen J p-value	0.835	0.933	0.412	0.266	0.505	0.224
Observations	1439	1439	1439	1439	1439	1439
R ²	0.068	0.059	0.051	0.337	0.329	0.321

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Industry dummies are included but not reported.

Table 8. The Effect of Bank Concentration on Entrepreneurship.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Bank Concentration</i>	6.566*** (1.015)	6.724*** (1.017)	6.438*** (1.016)	6.315*** (0.797)	6.466*** (0.803)	6.188*** (0.793)
<i>Bank Concentration</i> ²	-3.824*** (0.772)	-3.830*** (0.773)	-3.809*** (0.774)	-5.489*** (0.545)	-5.496*** (0.547)	-5.475*** (0.545)
<i>Bank Concentration*HTIS</i>		-0.644*** (0.168)			-0.620*** (0.157)	
<i>Bank Concentration*KIS</i>			1.230** (0.547)			1.167** (0.477)
<i>Initial Share of Industry</i>	-0.092 (1.106)	-0.079 (1.114)	-0.178 (1.111)	-0.712 (0.839)	-0.700 (0.844)	-0.794 (0.848)
<i>Log(GDP)</i>	-0.379*** (0.076)	-0.382*** (0.076)	-0.386*** (0.076)	-1.405*** (0.201)	-1.410*** (0.202)	-1.420*** (0.203)
<i>Financial Development</i>	1.014*** (0.219)	1.022*** (0.220)	1.033*** (0.221)	0.274** (0.139)	0.281** (0.140)	0.296** (0.140)
<i>Foreign Bank Ownership</i>	0.125 (0.080)	0.121 (0.080)	0.119 (0.080)	-0.175 (0.131)	-0.180 (0.132)	-0.189 (0.132)
<i>Government Effectiveness</i>				2.841*** (0.340)	2.845*** (0.342)	2.851*** (0.344)
<i>Activity Regulation</i>				0.923*** (0.093)	0.924*** (0.094)	0.922*** (0.094)
Cragg-Donald statistic	157.553	81.131	83.183	1724.014	81.100	83.469
Stock-Yogo critical values	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hansen J statistic	5.566	6.023	8.530	0.276	0.539	3.109
Hansen J p-value	0.018	0.049	0.014	0.600	0.764	0.211
Observations	1439	1439	1439	1439	1439	1439
R ²	0.067	0.057	0.049	0.340	0.332	0.324

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Industry dummies are included but not reported.

Coefficients of banking market structure variables maintain sign and are still significant. As concerns the banking capital structure variables, *Government-Owned Banks* is negative and significant. As suggested by Bonin and Wachtel (2003), when governments own banks, it may be that credit is not granted to start-up firms with the greatest long-term potential since, often, the entrepreneurial project is not well evaluated in terms of validity and riskiness. However, when we introduce in the regressions all the control variables such an effect vanishes. Instead, *Foreign Bank Ownership* is never significant in this sample.

Further, investigate on the impact of bank concentration on entrepreneurship when accounting for the impact of globalization and transition stage (see Table 9).

Table 9. The Effect of Bank Concentration on Entrepreneurship.

	(1)	(2)	(3)	(4)
<i>Bank Concentration</i>	5.589*** (0.693)	9.110*** (1.522)	6.557*** (0.757)	6.868*** (0.712)
<i>Bank Concentration</i> ²	-4.952*** (0.469)	-3.115*** (1.071)	-5.703*** (0.533)	-4.387 (3.445)
<i>Bank Concentration*Privatization</i>		-1.570** (0.743)		
<i>Bank Concentration*Globalization</i>				-0.026 (0.064)
<i>Privatization</i>	0.004 (0.038)	1.054** (0.487)		
<i>Globalization</i>			0.007** (0.003)	0.026 (0.047)
<i>Initial Share of Industry</i>	-0.691 (0.847)	-0.727 (0.845)	-0.718 (0.836)	-0.744 (0.822)
<i>Log(GDP)</i>	-1.184*** (0.117)	-1.014*** (0.093)	-1.156*** (0.091)	-1.067*** (0.208)
<i>Government Effectiveness</i>	2.641*** (0.267)	2.354*** (0.209)	2.530*** (0.217)	2.318*** (0.483)
<i>Activity Regulation</i>	0.899*** (0.089)	0.856*** (0.080)	0.953*** (0.094)	0.921*** (0.092)
Cragg-Donald statistic	6360.358	470.141	2044.413	189.861
Stock-Yogo critical values	11.04	n.a.	11.04	n.a.
Hansen J statistic	8.044	0.009	4.054	1.630
Hansen J p-value	0.018	0.926	0.132	0.202
Observations	1439	1439	1439	1439
R ²	0.338	0.332	0.337	0.334

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Industry dummies are included but not reported.

Globalization is positive and significant, meaning that a higher level of globalization promotes the process of firm creation since firms can more easily get in touch with foreign lenders and also access to international financial markets. We add the interaction term *Bank Concentration*Globalization* with the aim to test whether the effect of bank concentration differs for more internationally integrated countries. However, such interaction appear to be not

significant. *Privatization* has a positive impact and significant, meaning that the transition from a planned toward a market-oriented economy stimulates the entrepreneurial initiative. Moreover, the interaction term *Bank Concentration*Privatization* is negative and significant: the positive impact of banking concentration is lower for countries that have reached a greater progress in transition. One might argue that the positive impact of concentrated banking sectors clashes with progress in the transition stage: lender-borrower cooperation stimulates the entrepreneurship, however, when countries make progress in the stage of transition and thus in the stage of economic development, the benefits of the bank-based system begin to shrink and even the banking sector needs to restructure and become more competitive.

Finally, in the bottom of each table, we report the results of tests performed. The Cragg-Donald statistic is greater than the critical value, allowing us, therefore, to reject the null of weakness of the instruments¹⁵. The results of the Hansen J test, which checks the validity of the instruments, allow us to accept the null hypothesis and conclude that the overidentifying restriction is valid for each of the regressions.

6 Summary and conclusions

This contribution fills a gap in the literature by shedding light on the effect that banking market structure has on the entrepreneurial initiative in the Central and Eastern European transition countries.

We find evidence that bank concentration has fostered the entrepreneurial initiative during the period 2000-2007 through two channels.

From a microeconomic perspective, as Petersen and Rajan (1995) underline, banks with market power are more willing to engage in lending relationship with start-up firms. The market power assures banks that the lower interest rates charged to start-up firms will be compensated through long-term profit sharing in the future when firms are mature and profitable.

From a macroeconomic perspective, giving some degree of market power to banks makes the entire sector more stable. In fact, instability in the banking system reverberates to other industries since banks address financial resources toward firms. These points are especially true for Central and Eastern European countries, characterized by bank-based financial systems in which firms rely primarily on banking credit and do not have an effective alternative source of funding.

Further, more concentrated banking markets are suitable for financing physical-asset-

¹⁵Critical values by Stock and Yogo (2005) are not available when more than three variables are instrumented, but the Cragg-Donald statistics are still sufficiently high.

intensive industry rather than high-technology, R&D-based industries. Generally, physical-asset-intensive industries are traditional and well known, so the absence of market signals about their profitability does not cause problems in terms of investment decisions. When industries are intangible assets-based there is the need to improve transparency, thus bank-based system should become more competitive and, therefore, market-oriented.

The positive impact of concentration softens when countries move from a planned economy towards a more market-oriented one. The relationship-based concentrated system clashes with the characteristics of market-oriented economies that require a competitive banking system.

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A Appendix

Table 1. NACE Rev. 1.1

C	MINING AND QUARRING
10	Mining of coal and lignite; extraction of peat
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying
12	Mining of uranium and thorium ores
13	Mining of metal ores
14	Other mining and quarrying
D	MANUFACTURING
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear.
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
21	Manufacture of pulp, paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products and nuclear fuel
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastic products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products, except machinery and equipment.
29	Manufacture of machinery and equipment n.e.c.
30	Manufacture of office machinery and computers
31	Manufacture of electrical machinery and apparatus n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing n.e.c.
37	Recycling
E	ELECTRICITY, GAS AND WATER SUPPLY
40	Electricity, gas, steam and hot water supply
41	Collection, purification and distribution of water

Table 1. NACE Rev. 1.1. cont'd.

G	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES, MOTORCYCLES AND PERSONAL AND HOUSEHOLD GOODS
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles.
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and motorcycles.
H	HOTELS AND RESTAURANTS
55	Hotels and restaurants
I	TRANSPORT, STORAGE AND COMMUNICATION
60	Land transport; transport via pipelines
61	Water transport
62	Air transport
63	Supporting and auxiliary transport activities; activities of travel agencies
64	Post and telecommunications
K	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES
70	Real estate activities
71	Renting of machinery and equipment without operator and of personal and household goods
72	Computer and related activities
73	Research and development
74	Other business activities

Source: Eurostat

Table 2. 5-Bank Concentration Ratio across countries

	2001	2002	2003	2004	2005	2006	2007	Mean
<i>European Transition Countries</i>								
Bulgaria	n.a.	n.a.	n.a.	52.3	50.8	50.3	56.7	52.5
Czech Republic	68.4	65.7	65.8	64	65.5	64.1	65.7	65.6
Estonia	98.9	99.1	99.2	98.6	98.1	97.1	95.7	98.1
Latvia	63.4	65.3	63.1	62.4	67.3	69.2	67.2	65.4
Lithuania	87.6	83.9	81	78.9	80.6	82.5	80.9	82.2
Hungary	56.4	54.5	52.1	52.7	53.2	53.5	54.1	53.8
Poland	54.7	53.4	52	50	48.5	46.1	46.6	50.2
Romania	n.a.	n.a.	55.2	59.5	59.4	60.1	56.3	58.1
Slovenia	67.6	68.4	66.4	64.6	63	62	59.5	64.5
Slovakia	66.1	66.4	67.5	66.5	67.7	66.9	68.2	67
<i>Developed European Countries</i>								
Austria	44.9	45.6	44.2	43.8	45	43.8	42.8	44.3
Belgium	78.3	82	83.5	84.3	85.3	84.4	83.4	83
Cyprus	61.3	57.8	57.2	57.3	59.8	63.9	64.8	60.3
Denmark	67.6	68	66.6	67	66.3	64.7	64.2	66.3
Finland	79.5	78.6	81.2	82.7	82.9	82.3	81.2	81.2
France	42.5	46.1	46.7	49.2	51.9	52.3	51.8	48.6
Germany	20.2	20.5	21.6	22.1	21.6	22	22	21.4
Greece	43.9	43.5	66.9	65	65.6	66.3	67.7	59.8
Ireland	67	67.4	44.4	43.9	45.7	44.8	46.1	51.3
Italy	29	30.5	27.5	26.4	26.8	26.2	33.1	28.5
Luxembourg	28	30.3	31.8	29.7	30.7	29.1	27.9	29.6
Malta	81.1	82.4	77.7	78.5	75.3	71.4	70.1	76.6
Netherlands	82.5	82.7	84.2	84	84.5	85.1	86.3	84.2
Portugal	59.8	60.5	62.7	66.5	68.8	67.9	67.8	64.9
Spain	47	44.6	43.1	41.9	42	40.4	41	42.9
Sweden	54.6	56	53.8	54.4	57.3	57.8	61	56.4
United Kingdom	28.6	29.6	32.8	34.5	36.3	35.9	40.7	34.1
<i>European Countries</i>	59.1	59.3	58.8	58.5	59.3	58.9	59.4	59
<i>European Transition Countries</i>	70.4	69.6	66.9	65	65.4	65.2	65.1	65.8
<i>Developed European Countries</i>	53.9	54.5	54.5	54.8	55.6	55.2	56	54.9

Source: European Central Bank

Table 3. Variables' description.

Variables	Description	Source
Entrepreneurship	Average annual growth rate in the number of firms of industry j in country k (2000-2007).	Eurostat (SBS)
Banking Concentration	Average 5-Banking Concentration Ratio (2001-2007).	European Central Bank
Activity Restriction	Degree to which banks are allowed to engage in activities different from traditional spread-based (2000). Range: 1 to 4.	Bank Regulation and Supervision (Barth et al. (2001))
Control of Corruption	Perceptions of the extent to which public power is not exercised for private gain. Range: -2.5 to 2.5.	Worldwide Governance Indicators (Kaufmann et al (2010))
Financial Development	Sum of domestic credit to the private sector and stock market capitalization as a share of GDP (2000).	World Development Indicator (World Bank)
Foreign Bank Ownership	Average share of the banking system's assets that are 50% or more foreign owned.	Bank Regulation and Supervision (Barth et al. (2001))
Globalization	Average level of economic globalization. Range: 0 to 100.	KOF Index of Globalization
Government Effectiveness	Perception of the quality of public services and its independence from political pressures. Range: -2.5 to 2.5.	Worldwide Governance Indicators (Kaufmann et al (2010))
Government-Owned Banks	Average share of the banking system's assets that are 50% or more state owned.	Bank Regulation and Supervision (Barth et al. (2001))
Initial Share of Industry	Weight of the industry j on the overall industry in country k in terms of number of firms (2000).	Eurostat (SBS)
Log(GDP)	The logarithm of the GDP per capita at constant prices (2000).	World Development Indicator (World Bank)
Privatization	Level of progress in transition reached. Range: 1 to 4.	EBDR 2010
Property Rights	Degree to which a country's laws protect private property rights and the governmental enforcement. Range: 0 to 100.	Index of Economic Freedom (Heritage Foundation)
Banking Application	Ratio of accepted applications to applications sent to the authorities to exercise banking activity (2000).	Bank Regulation and Supervision (Barth et al. (2001))
Rule of Law	Perceptions of the extent to which agents have confidence in the rules of society. Range: -2.5 to 2.5.	Worldwide Governance Indicators (Kaufmann et al (2010))

Table 4. Descriptive statistics.

<i>Variables</i>	<i>Obs.</i>	<i>Mean</i>	<i>St. Dev</i>	<i>Min</i>	<i>Max</i>
Entrepreneurship	1439	0.19	0.56	-0.32	12.22
Banking Concentration	1439	0.66	0.14	0.50	0.98
Activity Restriction	1439	2.32	0.35	2.00	3.03
Control of Corruption	1439	0.42	0.35	-0.19	0.99
Financial Development	1439	0.42	0.20	0.10	0.69
Foreign Bank Ownership	1439	0.72	0.23	0.20	0.99
Globalization	1439	75.11	9.03	58.03	89.36
Governament Effectivness	1439	0.65	0.37	-0.13	1.01
Government-Owned Banks	1439	0.11	0.12	0.00	0.41
Intial Share of Industry	1439	0.01	0.03	0.00	0.47
Log(GDP)	1439	4253.85	2239.40	1563.02	9854.56
Privatization	1439	3.67	0.33	3.00	4.00
Property Rights	1439	55.06	13.14	30.00	72.05
Banking Application	1439	0.91	0.10	0.74	1.00
Rule of Law	1439	0.58	0.37	-0.10	0.99