BANK CONCENTRATION AND FINANCING OBSTACLE: EVIDENCE FROM DEVELOPING AND EMERGING MARKETS

By

Jia Shi
Master of Economics, Nanjing University, 2013

and

Xinrui Mao
Bachelor of Engineering, South China University of Technology, 2013

PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN FINANCE

In the Master of Science in Finance Program
of the
Faculty
of
Business Administration

SIMON FRASER UNIVERSITY
Term Fall, 2014

Approval

Name: Jia Shi, Xinrui Mao

Degree: Master of Science in Finance

Title of Project: Bank Concentration and Financing Obstacle: Evidence from developing and emerging markets

Supervisory Committee:

__ Christina Atanasova_____

Senior Supervisor
Associate Professor

__Evan Gatev_____

Second Reader
Associate Professor

Date Approved: _____

Abstract

The banking system is regarded as a mechanism that can covert the impact of the financial market development into growth. The amount of credit that the banking sector makes available for productive uses is one of the most significant measures of financial development.
Our paper tests the importance of banking competition for firms' access to finance following the original contribution by Thorsten, Asly and Vojislav (2004) for a cross-section of 22 emerging and developing countries. By conducting the regression test with new period of data, we try to explore how banking competition after financial crisis impact firms access to credit, especially in the developing and emerging countries.
Through regression, we conclude that with more bank concentration firms face fewer financing obstacles, and large enterprises can access credit easier than small and medium enterprises. Our results provide evidence for theories that focus on the potential positive effects of bank concentration which is inconsistent with theories that stress the negative effects of bank power.

Keywords: Bank Concentration; Financing Obstacle; Bank Regulation

Acknowledgements

We are using this opportunity to express our gratitude to everyone who supported us throughout the courses of this program. We are thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the project work. We are sincerely grateful to every SFU faculty for providing us with the facilities being required and conductive conditions for our program.

We would also like to express our warm thanks to Professor Atanasova and Professor Gatev for their support and guidance at our project work, and especially sharing their truthful and illuminating views on a number of issues related to the project.

Contents

List of Tables

Introduction

The banking system is regarded as a mechanism that can covert the impact of the financial market development into growth. The amount of credit that the banking sector makes available for productive uses is one of the most significant measures of financial development. Conventional wisdom suggests that any deviation from perfect competition in the credit market introduces inefficiencies that would harm firm's access to credit, thus hindering growth. Cetorelli and Gambera(2001) finds that concentration in the banking sector determines a general deadweight loss that depresses growth and also bank concentration promotes the growth of those industries that are more in need of external finance by facilitating credit access to firms, especially younger ones. However, some recent contributions have pointed out that banks with monopolisticy power have a greater incentive to establish lending relationships with their client firms, thus facilitating their access to credit lines.

Our paper tests the importance of banking competition for firms' access to finance following the original contribution by Thorsten, Asly and Vojislav (2004) for a cross-section of 22 emerging and developing countries. Banking crises in emerging markets in the 1990s were associated with major macroeconomic disruptions. The financial crisis indicated importance of regulatory and competition policies in the banking sector, which were underappreciated before the crisis. Therefore, our intention is to update the data from 1999 to 2011 and to explore how banking competition after financial crisis impact firms access to credit, especially in the developing and emerging countries.

Our results provide evidence that in more concentrated banking markets, firms of all sizes face lower financing obstacles, which is the opposite view of the original contribution. Also largest firm face the lowest financing obstacles, which is consistent with the original paper, while some theories predict a positive impact of bank concentration on alleviating financing obstacles for small firms and allowing them access to credit. Beck et al. (2005a) find a robust positive relationship between the relative size of the small and medium enterprises and economic growth after controlling for other growth determinants. Beck, Demirguc-Kunt, and Maksimovic (2001a) find that small firms are more significantly influenced but this influence is dampened in countries with higher levels of financial and institutional development.

Public bank ownership, a high degree of government interference in the banking system and restrictions on banks' activities do contribute to increasing the performance of industries that demand more credit and help promote growth of industries that lack collateral. On the other hand, private banks have a significant impact on the interaction of bank concentration with financing obstacles.

Our paper uses the methodology and sources of data provided in the original paper and also makes several data improvements. This paper uses cross-country data from developing and emerging economies and also includes a broad cross section of countries and firms of different sizes. The original paper has studied how bank concentration impacts by using firm level data from the World Business Environment Survey (WBES), a major cross-sectional firm level survey, which has the assessment of growth obstacles as perceived by firms of different sizes. Upon that, we also test what level of financing obstacles different sectors face. Cetorelli and Gambera (2001) show that industries that depend more on external finance grow relatively faster in more concentrated sectors.

Also, we follow the Thorsten, Asly and Vojislav (2004) that not only exploits cross-country variance in bank concentration but also in the regulatory environment and the ownership structure of the banking sector. Here we use data from Barth, Caprio and Levine (2001), which is not updated to 2011 due to unavailability of data. In terms of the ownership structure of the banking system, we find many firms in our data sample are domestically-owned. So we added domestically-owned as a dummy variable into our regression. Clarke, Cull and Martinez Peria (2001) show that a larger foreign bank presence decreases financing obstacles and increases the share of investment financed with bank finance.

The remainder of the paper is organized as follows. Section 1 discusses the recent studies on the role of banking system on economic development and impacts of banking concentration on enterprises growth. Section 2 introduces the variables we use and the sources of data. Section 3 describes the methodology we apply. Section 4 presents the results and section 5 concludes the paper.

Literature review

Modern development theories increasingly emphasize the key role of access to finance. As surveyed by Levine (2005), a large body of literature has shown the importance of efficient financial systems and easy access to finance for economic development. Beck et al. (2007) find that nations with better developed financial systems and easier access to finance not only have faster economic growth but also have lower economic inequality and thus greater benefits for the poorer population. Rajan (2012) shows that easier access to financing is positively associated with greater national wealth and greater government favoritism toward selected firms.

Previous research has suggested that competition promotes growth (Cetorelli, 2004; Cetorelli and Strahan 2006), Black and Strahan (2002) find evidence across US states that higher concentration results in less new firm formation, especially in states and periods with regulated banking markets. Competition can drive banks to reduce their lending costs, which can lead to an increase in demand for bank funds in order to support business and growth. It has also been argued that increased market power in combination with less competition can help relax external financing constraints on non-financial firms (Petersen and Rajan, 1995). Beck st al (2006) finds that bank concentration increases financial stability after controlling for countries' regulation and institutions.

Claessens and Laeven (2005) found that sectors heavily dependent on bank financing grow faster in countries where there is fierce banking competition, while Maudos and Fernandez de Guevara (2006) suggest that the exercise of market power enhances economic growth, supporting the lending relationship argument, with the implication that bank competition may have a negative impact on the availability of funds for industries. However, Petersen and Rajan has observed that external-financing-depend industries experience a slowdown in growth when competition in banking sector is high, as banks find it less attractive to invest in the lending relationship. Claessens and Laeven (2005) find similar results using direct measures of bank competition.

The ownership structure of banks might also influence the relation between market power access and costs of external financing. Domestically owned banks might have more information and better enforcement mechanisms than foreign-owned banks and so might be more willing to lend to opaque borrowers. Government-owned banks are mostly not pursuing maximizing profit and often have the explicit mandate to lend to certain groups of borrowers.

While cross-country research sheds doubt on a causal link between SMEs (small and medium-size enterprises) and economic development, there is substantial evidence that small firms face larger growth constraints and have less access to formal sources of external finance. Beck et al. (2005a) find a robust, positive relationship between the relative size of the SME sector and economic growth, after controlling for other growth determinants. Financial development allows existing firms to exploit growth and investment opportunities and to achieve larger equilibrium size. Small firms do not only report higher financing obstacles in their operation and growth, they are also more adversely affected by these obstacles in their operation and growth.

There are a number of recent cross-country studies highlighting the importance of bank regulation and supervision for the functioning and development of banking system. Pasiouras (2008) mentioned that stricter capital adequacy; powerful supervision and market discipline power promote technical efficiency. Economic theory provides conflicting predictions about the impact of regulatory and supervisory policies on bank performance (e.g. Barth el at, 2004 and Barth el at, 2007a). They also show that policies that rely excessively on official supervision and restrictions on bank activities are worse for financial development and stability. By limiting banks' activities, regulatory restrictions could also impede banks' ability to diversify income streams and reduce the franchise value of the bank, which may limit the incentive for efficient behaviors.

Using a panel data set of developing countries and of firms of different sizes, we will test:

1. Is bank concentration in developing and emerging economies positively or negatively related to financing obstacles?
2. Does the relation between concentration and financing obstacles vary across firms of different sizes?
3. Does the relation between concentration and financing obstacles vary across different regulatory regimes, ownership structures, and institutional environments?

Data and Summary Statistics

We follow the approach introduced by Thorsten, Asly and Vojislav (2004), who focus on analyzing the effect of bank concentration on financing access and the influence of other variables on the relations between them. The data in our research primarily comes from three different main resources. The firm level data is obtained from The World Bank's Enterprise Surveys, while bank concentration indicator can be found from BankScope. Country-level data is sourced from Barth, Caprio, and Levine (2013) and The World Bank. The World Bank surveys on bank regulation, which is conducted every four years from 1999, provides most of the regulatory indicators of the banking industry.

The enterprise survey is actually an updated version of WBES, and provides the most comprehensive firm-level data in emerging and developing economics. The survey record items like sales, ownership, operation, financing pattern, but simplifies some of the questions like "access to finance". Also, the survey minimizes measurement error and yields comparable data across country after using standardized instrument and uniform sampling methodology. Therefore, survey results from different regions will not be driven by differences in cultural, institutional and political environment. With 130,000 firm data series from 135 countries, we try to find the most complete information among them and eventually narrow the data down to 12,933 firms. Table 1 presents the country-level variables for 71 developing and emerging countries.

Apart from evaluating the financing availability and efficiency from various aspects, the survey sticks strictly to the core content of investigation and utilizes a straightforward questioning: " In access to financing, which includes availability and cost (interest rates, fees and collateral requirements), how much obstacle is there to the current operations of this establishment? " The answer varies from No obstacle (0), Minor obstacle (1), Moderate obstacle (2), a Major obstacle (3), and a Very Severe obstacle (4).

Table 1

BANKING MARKET STRUCTURE AND FINANCING OBSTACLES

Country	Concentration	Restrict	Banking freedom	Inflation rate	private credit	credit registry	Institutional Development	Fraction Denied	GDP per capita	foreign bank share	public bank share	Growth rate
Angola	78.51	8.00	47.70	13.47	20.18	1.80	-0.28	0.00	5159.23	58.70	18.72	0.22
Armenia	45.81	12.00	68.86	7.65	35.37	23.70	0.56	0.00	3421.70	67.45	0.00	0.10
Australia	77.00	8.00	82.03	3.39	123.20	0.00	0.52	0.00	62080.98	13.30	0.00	0.20
Bangladesh	38.19	14.00	54.06	10.70	48.82	0.60	-0.90	1.00	732.07	6.59	34.07	0.10
Belarus	83.50	9.00	50.13	53.23	39.25	49.50	-0.43	0.00	6305.77	27.30	71.70	0.08
Bhutan	100.00	8.00	56.71	8.85	47.09	6.40	0.27	0.25	2523.67	5.54	47.56	0.14
Botswana	91.70	12.00	72.04	8.46	27.52	0.00	0.50	0.50	7697.40	92.90	7.10	0.10
Brazil	70.55	5.00	56.86	6.64	61.35	36.10	-0.19	0.05	12576.20	17.67	43.52	0.15
Bulgaria	54.49	7.00	65.69	4.22	72.05	52.80	-0.61	0.11	7286.39	80.73	3.22	0.13
Burundi	87.04	9.00	51.42	9.74	20.79	0.30	-0.97	0.25	246.91	16.28	48.92	0.12
Chile	73.71	14.00	78.73	3.34	101.55	35.60	0.51	0.00	14510.97	39.40	19.46	0.14
Colombia	63.40	12.00	70.70	3.41	44.72	0.00	-0.94	0.00	7124.55	19.80	6.00	0.15
Costa Rica	77.95	12.00	66.92	4.88	47.15	25.50	0.52	0.00	8704.11	30.92	53.69	0.12
Croatia	75.23	8.00	60.37	2.25	71.10	0.00	0.66	0.63	14371.95	88.77	4.19	0.08
Cyprus	69.40	11.00	67.64	3.29	296.46	0.00	1.33	0.18	29206.51	35.33	1.18	0.05
Dominican Republic	87.27	8.00	61.31	8.46	24.01	35.90	-0.80	0.00	5462.70	8.45	31.43	0.07
Ecuador	70.16	12.00	48.03	4.47	27.49	0.00	-0.50	0.25	5035.24	2.13	16.53	0.12
El Salvador	84.66	5.00	66.16	5.13	39.75	23.90	-0.81	0.00	3698.55	92.95	5.96	0.07
Estonia	93.00	9.00	75.88	4.98	83.34	0.00	0.29	0.00	16982.30	99.00	0.00	0.19
Fiji	100.00	13.00	58.69	8.67	75.84	0.00	0.23	0.25	4324.69	100.00	0.00	0.15
Finland	91.00	7.00	73.42	3.42	97.04	0.00	0.78	0.00	48694.54	74.00	0.00	0.10
France	86.80	11.00	63.46	2.12	115.90	43.30	0.38	0.00	42578.18	12.32	1.58	0.08
Ghana	44.99	11.00	64.25	8.73	15.05	0.00	0.26	0.00	1594.03	50.97	9.72	0.20
Greece	77.50	8.00	55.71	3.33	121.88	0.00	-0.16	0.00	26061.44	20.90	10.80	-0.01
Guatemala	79.50	13.00	61.17	6.22	23.57	17.30	-0.36	0.13	3240.37	10.30	1.80	0.12
Hungary	63.00	7.00	67.00	3.96	66.21	0.00	0.17	0.02	13784.18	82.83	3.94	0.08
Iceland	100.00	7.00	72.42	3.99	97.22	0.00	0.20	0.00	44019.39	0.00	40.51	0.08
India	37.62	13.00	55.66	8.86	49.73	0.00	-0.91	0.70	1539.61	7.19	73.70	0.09
Indonesia	50.30	10.00	58.50	5.36	31.75	31.80	-0.06	0.08	3469.75	34.18	38.41	0.18
Ireland	72.40	5.00	76.19	2.58	199.73	0.00	1.11	0.00	49387.27	62.90	20.69	0.08
Israel	94.00	14.00	68.44	3.46	89.46	0.00	0.63	0.00	33250.51	2.60	0.00	0.09
Italy	65.60	10.00	60.95	2.74	122.59	23.00	0.79	0.20	36988.16	17.90	0.05	0.07
Jamaica	94.70	8.00	66.72	7.53	26.82	0.00	0.62	0.67	5346.22	95.10	0.00	0.09
Kenya	50.00	10.00	57.12	14.02	37.38	0.00	-1.08	0.00	816.44	37.20	4.80	0.03
Korea, Rep.	79.60	12.00	1.00	4.00	138.13	0.00	0.38	0.00	24155.83	76.80	22.30	0.09
Latvia	59.30	7.00	68.66	4.38	82.02	59.70	0.31	0.09	13827.36	69.00	15.50	0.21
Lithuania	80.30	9.00	73.00	4.13	53.24	15.00	0.74	0.00	14227.69	80.50	0.00	0.20
Luxembourg	30.80	10.00	74.20	3.41	174.35	0.00	0.85	0.00	11913.18	94.00	5.20	0.09
Madagascar	82.00	12.00	61.74	9.48	11.06	0.10	-0.17	0.14	454.54	100.00	0.00	0.10
Malawi	82.50	12.00	55.41	7.62	19.81	0.00	-0.33	0.00	364.09	29.10	9.30	0.01
Maldives	97.80	9.00	51.04	12.83	54.42	17.70	0.31	0.00	6515.74	61.30	38.70	-0.01
Malta	71.00	12.00	66.41	2.72	127.77	0.00	1.00	0.00	22346.32	86.00	0.00	0.13
Mauritius	65.00	14.00	76.51	6.53	91.42	49.80	0.39	0.00	8749.58	68.00	1.00	0.15
Moldova	69.30	13.00	57.28	7.61	33.56	0.00	-0.02	0.00	1970.84	41.50	12.50	0.21
Mozambique	91.61	10.00	54.97	10.35	24.37	3.80	0.50	0.00	510.46	91.61	0.00	0.32

TABLE 1
CONTINUED

Country	Concentration	Restrict	Banking freedom	Inflation rate	private credit	credit registry	Institutional Development	Fraction Denied	GDP per capita	foreign bank share	public bank share	Growth rate
Namibia	100.00	8.00	59.42	5.05	49.15	0.00	-0.20	0.75	5614.93	86.33	0.00	0.10
Nepal	26.18	13.00	50.15	9.27	52.95	0.00	-1.03	0.00	694.14	17.49	24.31	0.17
Norway	76.00	7.00	70.91	1.30		0.00	0.72	0.00	99091.09	29.50	0.00	0.15
Pakistan	51.00	11.00	55.16	11.92	18.12	6.90	0.03	0.00	1212.98	58.50	21.00	0.19
Panama	47.20	12.00	63.37	5.88	84.64	0.00	0.18	0.00	8895.18	62.08	11.00	0.14
Paraguay	66.91	5.00	61.97	8.25	38.94	15.70	-0.68	0.00	3814.21	40.37	6.05	0.23
Peru	87.20	8.00	67.45	3.37	27.33	28.50	-0.38	0.00	5759.40	48.60	0.00	0.13
Poland	49.20	15.00	67.02	4.26	54.82	0.00	0.76	0.04	13384.78	62.00	22.00	0.09
Portugal	74.20	7.00	63.47	3.65	192.10	86.20	0.83	0.02	22532.51	22.14	22.64	0.04
Romania	56.80	5.00	65.50	5.79	44.50	15.20	0.10	0.14	9063.68	84.10	7.90	0.11
Serbia	45.10	10.00	59.41	11.14	50.51	0.00	-1.14	0.00	6047.74	73.50	17.90	0.19
Seychelles	94.00	14.00	56.16	2.56	25.96	0.00	0.08	0.50	12117.81	69.00	31.00	0.12
Sierra Leone	73.79	7.00	50.53	16.19	7.69	0.00	-0.26	0.29	499.92	62.29	37.71	0.12
Slovenia	60.40	9.00	62.70	1.81	90.07	3.30	0.62	0.00	24478.32	28.42	51.12	0.07
South Africa	91.57	8.00	62.48	5.28	143.93	0.00	0.70	0.50	7830.51	27.85	0.07	0.09
Spain	64.00	7.00	67.25	3.20	209.24	54.70	1.02	0.00	31117.90	8.00	0.00	0.05
Sri Lanka	72.70	8.00	59.98	6.72	30.64	0.00	-0.58	0.57	2835.69	14.20	59.10	0.18
Suriname	87.80	6.00	54.18	17.71	23.98	0.00	0.05	0.00	8236.20	21.00	33.20	-0.01
Switzerland	66.60	4.00	81.57	0.23	169.85	0.00	0.86	0.17	83270.24	11.80	16.10	0.05
Tanzania	64.00	6.00	57.76	12.69	17.77	0.00	-0.36	0.00	530.39	49.03	4.72	0.01
Thailand	63.18	12.00	63.35	3.81	140.34	0.00	-0.06	0.00	5192.12	6.80	17.50	0.08
Turkey	60.14	13.00	64.86	6.47	53.11	23.80	-0.31	0.11	10604.55	16.56	31.60	0.05
Uganda	60.73	16.00	59.91	18.69	18.60	0.00	-1.04	0.17	440.80	75.16	3.21	-0.07
Ukraine	36.80	7.00	49.30	7.96	70.96	0.00	-0.81	0.43	3575.49	47.80	16.90	0.20
Uruguay	74.50	13.00	69.32	8.09	23.42	28.60	0.77	0.00	13960.96	54.36	45.61	0.21
Vanuatu	100.00	14.00	59.47	0.86	67.98	0.00	-0.03	0.00	3249.86	86.40	13.60	0.10

NOTES: Concentration is share of 5 largest banks in banking system in terms of both deposits. Restrict is the measure of the extent to which the bank financial activities. Banking freedom is the degree of government interference in the banking system. Inflation rate takes the value of 2011. Private credit refers to the financial credit offered to private sector by financial institution as share of GDP. *Credit Registry* is the number of individuals and firms listed in private or public registry as share of population. Institution development is the average indicator of voice and accountability, regulatory quality, rule of law, control of corruption, political stabilities, and effectiveness of government respectively. Fraction denied is the indicator of government's restriction to enter the bank sector. Foreign bank share measures the percent of the banking system's assets in banks that are foreign-controlled and *public bank share* describes the percent of the banking system's assets in banks that are public-controlled. GDP per capital takes the natural logarithm of 2011 country data. Growth rate is the percent in 2011.

Since each firm evaluates its access to credit differently based on the financing process and related policy, the average score for each country also differs from one another. Overall, 53% of the establishments don't face any obstacle when they seek credit from banks, 20% out of 12933

establishments come across minor to moderate financing obstacles, whereas 27% of establishments feel major to severe financing obstacles during their business operation.

The indicators here are generally the same as those in Thorsten, Asly and Vojislav (2004) as we try to replicate the approach and further explore the link between market structure and access to credit based on the new period of data. However, we also improve the efficiency and effectiveness of regression procedure by selecting more appropriate dependent variables and redefining the existed ones. In terms of the firm-level data, we add Domestic which take on a value of one if the firm is owned by private domestic individuals, companies or organizations. Likewise, government takes on a value of one if the firm is owned by state or government, and foreign takes on a value of one if the firm is owned by private foreign individuals, companies or organizations. In our data sample, 94% of firms are domestically-owned, 9% are foreign-owned, and the rest government-owned. We also control the industry that each firm is operating in by taking the sector as dummy variables. *Manufacturing* include food, textile, garments, etc; *Service* includes retail, IT, restaurant and hotel. We decide to abandon the variable "exporting" after observing the insignificant result in Thorsten, Asly and Vojislav (2004), as to facilitate the following regression process. 52% of our sample firms are in the manufacturing industry and 43% of them are in service industry. Instead of using "number of competitors" as it can only reflect one aspect of the competition environment, we rely on the survey question: "Do you think that the practices of competitors in the informal sector are No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?" The five options correspond to 0 to 4 respectively. Overall, 8% of all firms in the sample report competition as a very severe obstacle, 13% as a major obstacle, 18% as a moderate obstacle, and 55% as no or minor obstacle. *Sales* is also a firm attribute to be controlled for, and we take the log of sales to better fit the regression model. As Table 2 (panel A) shows, sales (log) of the firms in our sample range from 0 to 37.8 with an average of 16.63. The correlation analysis in Table 2 indicates that domestic firms, small firms (measure by sales), and firms facing more competition will come across trouble when ask for financial credit.

The *bank concentration* is the main bank-level indicator we need to collect for each country. The World Bank survey on bank regulation presents data on the share of 5 largest banks in banking system in terms of both deposit and asset. We calculate the concentration based on deposit, however, as is the case with most data collection endeavors, the survey methodology has some limitations. First, rather than covering any non-regulated credit providers, the survey can only

collect information of regulated financial institutions. This will very likely underestimate the scale of financial credit providers as the loan is often carried out by non-regulated providers in the developing and emerging countries. Second, there might be measurement error as different definition and environment across countries which affect the uniformity of the answer. However, since the BankScope suffers from the coverage issue, we eventually decide to choose survey answer over the BankScope. According to our sample report, the bank concentration has substantial variation between countries. Guernsey has five largest banks occupying only 11.6% of banking system, while Fiji's top five take the whole market, with indicator as high as 100%.

Table 2

SUMMARY STATISTICS AND CORRELATION

A. Summary Statistics

Variable	Obs	Mean	Median	Std dev.	Max	Min
General Financing obstacle	29921	1.20	0	1.44	4	0
Government	29921	0.86	0	7.68	100	0
Foreign	29921	5.71	0	21.44	100	0
Manufacturing	29921	0.47	0	0.50	1	0
Service	29921	0.47	0	0.50	1	0
Other	29921	0.07	0	0.25	1	0
Sales	29921	16.63	16.52	2.98	37.08	0
Competition	29921	1.07	0	1.42	4	0
Concentration (%)	180	47.85	72.70	19.40	100.00	11.60
Restrict	204	10.01	10.00	2.94	16.00	4.00
Fraction denied	180	0.13	0.00	0.22	1.00	0.00
Banking freedom	204	60.28	60.02	11.38	90.14	1.00
Credit Registry	258	8.19	0.60	14.37	86.20	0.00
Institutional development	215	-0.02	-0.04	0.71	2.07	-1.73
GDP per capita	225	14945.94	5704.98	22563.94	163025.86	246.91
Private Credit (%)	258	60.99	44.79	51.53	296.46	4.36
Foreign bank share (%)	180	32.07	48.60	33.52	100.00	0.00
Public bank share (%)	180	10.04	8.85	17.98	73.70	0.00
Inflation	214	6.82	5.02	6.83	53.23	-3.70
Growth	204	0.12	0.10	0.09	0.39	-0.54

TABLE 2
CONTINUED

B. Correlation Between Firm-Level Variables

	Financing Obstacle	Government	Foreign	Manufacturing	Service	Sales	Competition
Domestic	0.05	-0.03	-0.64	-0.02	-0.02	-0.11	0.03
Government	-0.03	1.00	0.00	0.00	-0.01	0.13	-0.03
Foreign	-0.05	0.00	1.00	0.02	0.02	0.15	-0.04
Manufacturing	-0.01	0.00	0.02	1.00	0.99	0.01	0.00
Service	-0.02	-0.01	0.02	0.99	1.00	0.00	0.00
Sales	-0.04	0.13	0.15	0.01	0.00	1.00	-0.04
Competition	0.25	-0.03	-0.04	0.00	0.00	-0.04	1.00
Concentration	-0.13	0.07	0.10	0.02	0.02	0.12	0.02

C. Correlation Between Country-Level Variables

	Concentration	Restrict	Fraction Denied	Economic Freedom	credit registry	Institutional Development	GDP per capita	Private Credit	foreign-owned share	public-owned share	inflation rate
Restrict	-0.23	1.00									
Fraction Denied	-0.31	0.19	1.00								
Economic Freedom	0.48	-0.02	-0.44	1.00							
credit registry	0.22	-0.17	-0.24	0.29	1.00						
Institutional Development	0.42	-0.17	-0.36	0.71	0.20	1.00					
GDP per capita	0.36	-0.19	-0.27	0.60	0.35	0.66	1.00				
Private Credit	-0.16	-0.22	0.15	0.06	0.29	0.15	0.69	1.00			
foreign-owned share	0.42	-0.32	-0.44	0.49	0.02	0.44	0.25	-0.03	1.00		
public-owned share	-0.02	0.14	0.37	-0.33	0.20	-0.19	0.09	0.16	-0.73	1.00	
Inflation	0.17	0.08	-0.07	-0.44	0.24	-0.35	-0.34	-0.34	-0.16	0.35	1.00
Growth	-0.17	-0.31	0.09	-0.04	0.02	0.17	0.06	0.31	0.04	0.10	-0.27

NOTES: Table A presents the basic statistic of all the variables while table B and C describe the correlation between firm-level and country-level variables. Financing obstacle is the numerical response of the question: In access to financing, which includes availability and cost (interest rates, fees and collateral requirements), how much obstacle is there to the current operations of this establishment? Domestic, Government and Foreign are dummy variables that take on one if the firm is owned by domestic, government or foreign organization. Manufacture and service takes on 1 f firm operates in manufacturing or service industry, 0 if not. Sale is the natural logarithm of 2011 firm data. Competition is the numeric response of question: "Do you think that the practices of competitors in the informal sector are No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?" Concentration is the share of 5 largest banks in banking system in terms of deposits. Restrict is the measure of the extent to which the bank financial activities. Banking freedom is the degree of government interference in the banking system. Inflation rate takes the value of 2011. Private credit refers to the financial credit offered to private sector by financial institution as share of GDP. Credit Registry is the number of individuals and firms listed in private or public registry as share of population. Institution development is the average indicator of voice and accountability, regulatory quality, rule of law, control of corruption, political stabilities, and effectiveness of government respectively. Fraction denied is the indicator of government's restriction to enter the bank sector. Foreign bank share measures the percent of the banking system's assets in banks that are foreign-controlled and public bank share describes the percent of the banking system's assets in banks that are public-controlled

Since regions with different economic development will tend to have different financing obstacles, we control for *GDP per capita* in order to distinguish between the influence of market structure and general economic standard. We also care about the legal and institutional environment that probably affects the access to credit, thus we collected data from *Institutional Development* which is an average of six indicators representing voice and accountability, regulatory quality, rule of law, control of corruption, political stabilities, and effectiveness of government respectively. We use the data from Kaufmann, Kraay, and Zoido-Lobaton (1999) as the institutional development in the economics of our sample didn't change too much in the past ten years.

Regulatory structure of banking system is also one of the aspects we want to control for. Regarding regulatory restriction and government interference, we have the following four indicators. *Restrict* is the average index proxying for the extent to which the bank may engage in the security, insurance and real estate activities, and the extent to which banks may own and control non-financial firms. The number doesn't convey mean, but higher value denotes more restriction on bank activities. *Fraction denied* is the degree to which the application to enter banking are denied. It is comprised of domestic by indicating a value of 0 or 1. Both these two indicators come from World Bank surveys on bank regulation conducted in 2011. *Credit Registry* reports the number of individuals and firms listed in private or public registry with information of repayment history, credit outstanding, etc. This indicator is an aggregate of both public and private data where a higher value suggests the availability of more complete information. We use *Banking freedom* to measure how freely the banks can be operated under the regulation of government which ensure the basic transparency and integrity of banking system. Data can be obtained from the Heritage Foundation and it varies from 1 to 90 with huge variation.

The ownership structure and credit development can also put an impact on the relation between bank concentration and financing access. *Public bank share* describes the percent of the banking system's assets in banks that are publically-controlled, while *foreign bank share* describes the percent of the banking system's assets in banks that are foreign-controlled. Credit development can be reflected by *private credit*, which refers to the financial credit offered to private sector by financial institution as share of GDP. This indicator is provided by the World Bank database.

Other variables to be controlled for include GDP growth rate as we assume higher financial barriers impede economy growth and vice versa. Inflation rate represents the stability of

monetary environment, and firms tend to face less trouble when they borrow money in a stable economy.

As Table 3 shows, more concentrated market structure corresponds to better institutional and economic development, more banking freedom and credit registry as well as a larger foreign-owned share. This correlation makes sense in the emerging and developing countries. Normally, the evolvement of finance industry in the developing country start from few banks, resulting in a concentrated market structure. With substantial market share of banking sector, those big banks have more initiative to ensure the accessibility and health of credit business. In the range of less developed economics, the country with faster economic development will have faster upgrade in the financial market structure, which is more concentrated.

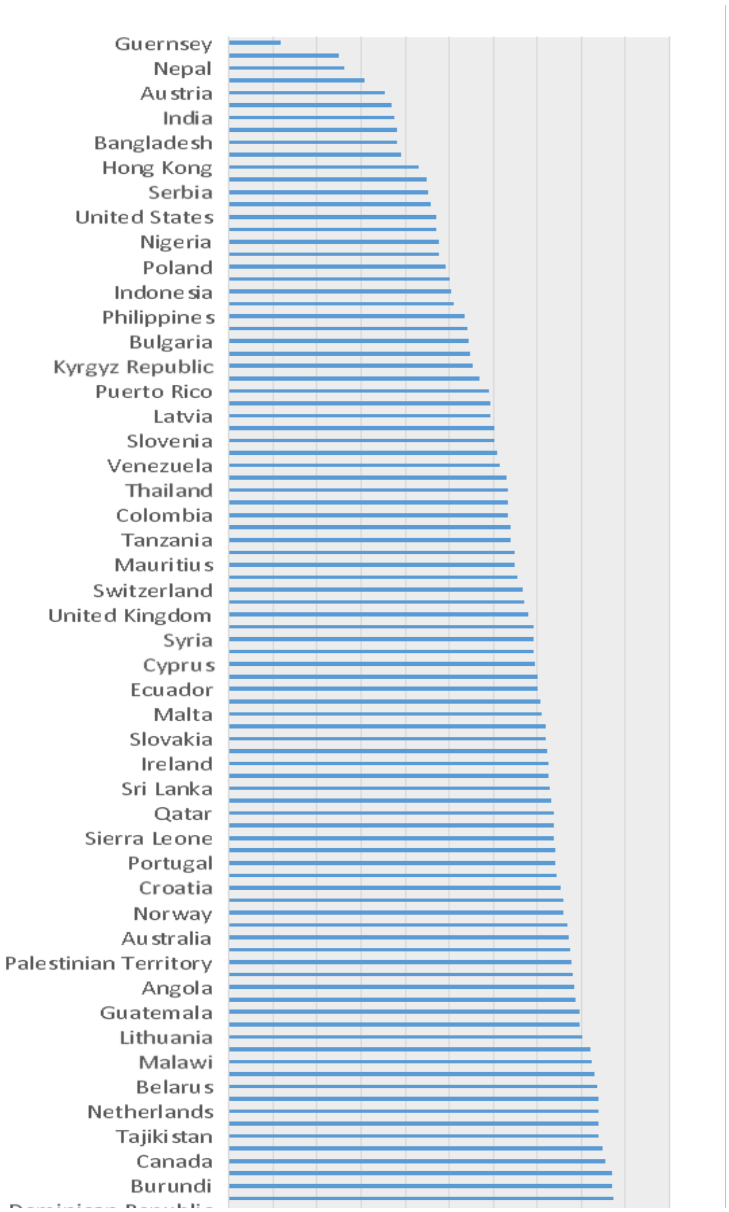

Figure 1 Banking Concentration across countries.
Concentration is calculated as share of asset in five largest banks in terms of deposits.
(Source: The World Bank Survey, 2011)

Methodology

To estimate the effect of bank concentration on financing obstacles, we use the following model:

$$\begin{aligned} Financing\ Obstacle_{j,k} &= \alpha + \beta_1 Governmentj_k + \beta_2 Foreign_{j,k} + \beta_3 Exporter_{j,k} \\ &+ \beta_4 No.of\ Competitiors_{j,k} + \beta_5 Manufacturing_{j,k} + \beta_6 Service_{j,k} \\ &+ \beta_7 Size_{j,k} + \beta_8 Inflation_k + \beta_9 Growth_k + \beta_{10} Concentration_k + \varepsilon_{j,k} \end{aligned}$$

Given that Financing Obstacle is a polychotomous dependent variable with a natural order, we use the ordered probit model to estimate Regression (1). We assume that the disturbance parameter has a normal distribution and use standard maximum likelihood estimation.

To assess whether bank concentration has a different effect on firms depending on their size, we interact concentration with dummy variables indicating whether the firm is small (5-50 employees), medium-size (51-500 employees) or large (more than 500 employees). The industry dummies correct for industry-specific effects.

Results

In general, Table 3 displays the result which point out that firms face stricter barriers to financial credit in less concentrated banking systems, which is the opposite of results gained by Thorsten, Asly and Vojislav (2004). In Column 1, the coefficient of the concentration parameter is significantly negative, demonstrating contrary movement between market powers and financing obstacle. Petersen and Rajan (1995) highlight this potential incompatibility between bank competition and the establishment of close lending relationships. In column 2, we include the dummy variables for small, medium and large firms and interact them with bank concentration respectively. All the three interaction coefficients enter significantly negative with the significance level remaining at the 0%. Moreover, the interaction with Large is highest, providing some evidence that large firms have less difficulty in borrowing money in concentrated banking systems. This growth-impeding effect of bank concentration has been studied by other researchers and it has been proved that larger firms have greater relative access to short term and long-term loans, especially in downturns.

Further, we control for GDP per capita, and the concentration turns out to be significantly negative (column 4). The same result applies to GDP per capita when we introduce its interaction with concentration, but the significance test of interaction failed (column 5). Without significant coefficient of interaction, we cannot assess the influence of economic development to the robust relation between market structure and firms' access to external financing. However, as GDP per capita is negative in both regression processes, we can at least predict that more advanced countries face fewer financing barriers.

Moreover, other variables in Table 3 illustrate their relations with financing obstacle. The coefficient of the variable capturing inflation with financing obstacles is positive and statistically significant, providing some evidence that countries of lower inflation face lower financing obstacles. With other indicators unchanged, positive Manufacturing and negative Service imply that manufacturing sector will have an easier time than service sector when comes to external financing from banks.

Table 3
CONCENTRATION AND FINANCING OBSTACLE

	Financing obstacle	Financing obstacle	Financing obstacle	Financing obstacle
Domestic	0.194	0.183	0.194	0.194
	(0.026)**	(0.035)**	(0.024)**	(0.024)**
Foreign	-0.008	0.027	0.011	0.010
	(0.902)	(0.685)	(0.868)*	(0.872)
Government	-0.260	-0.221	-0.136	-0.136
	(0.036)**	(0.076)*	(0.268)	(0.267)
Manufacturing	0.025	0.042	0.034	0.034
	(0.101)	(0.007)***	(0.023)**	(0.023)**
Services	-0.036	-0.054	-0.042	-0.042
	(0.020)**	(0.001)***	(0.005)***	(0.005)***
Sales	-0.027	-0.010	-0.046	-0.046
	(0.000)***	(0.108)	(0.000)***	(0.000)***
Competition	0.237	0.235	0.213	0.213
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Inflation	1.334	1.075	0.509	0.513
	(0.000)***	(0.000)***	(0.012)**	(0.012)**
Growth	-0.335	-0.185	0.393	0.397
	(0.121)	(0.396)	(0.070)*	(0.069)*
Concentration	-1.302		-0.436	-0.361
	(0.000)***		(0.000)***	(0.544)
Concentration* Small		-1.193		
		(0.000)***		
Concentration * Medium		-1.472		
		(0.000)***		
Concentration* Large		-1.621		
		(0.000)***		
GDP per capita			-0.236	-0.230
			(0.000)***	(0.000)***
Concentration * GDP per capita				-0.010
				(0.898)
R^2	0.084	0.086	0.100	0.112
Observation	12933	12933	12933	12933

NOTES: The equation is $financing\ obstacle = \alpha + \beta_1 domestic + \beta_2 government + \beta_3 foreign + \beta_4 manufacturing + \beta_5 service + \beta_6 sales + \beta_7 competition + \beta_8 inflation + \beta_9 growth + \beta_{10} concentration + \varepsilon$. Financing obstacle is the numerical response of the question: In access to financing, which includes availability and cost (interest rates, fees and collateral requirements), how much obstacle is there to the current operations of this establishment? Domestic, Government and Foreign are dummy variables that take on one if the firm is owned by domestic, government or foreign organization. Manufacture and service takes on 1 f firm operates in manufacturing or service industry, 0 if not. Sale is the natural logarithm of 2011 firm data. Competition is the numeric response of question: "Do you think that the practices of competitors in the informal sector are No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?" Concentration is share of 5 largest banks in banking system in terms of both deposits. Size is categories based on number of employees. Small firm has no more than 20 people, median has 20 to 99 people and large firm has more than 100 people. The p-value of coefficient is reported in bracket. *, ** and *** express significance level of 1%, 5% and 10%.

When we control for the size of firm and vary the extent of bank concentration, the change of financing obstacle based on the regression tells the same story, as shown in Table 4. Here we set all variables to their actual value, while change the concentration to 25%, 50%, 75% of its value. By moving bank concentration gradually from 25% to 75%, we can observe the change of probability that firms report external financing as major obstacle. The negative effect of market structure to obstacle is stronger for large enterprises (11.3%) than for small-size enterprises (8%). Likewise in Table 1, the coefficient of interaction between concentration and large enterprises (-1.621) is higher than that of interaction between concentration and small enterprises, indicating that large enterprises face fewer financing obstacles in more concentrated banking systems.

Table 4

CONCENTRATION AND FINANCING OBSTACLES---QUANTIFYING THE EFFECT

Bank concentration	25%	50%	75%	Change between 25% and 75% percentiles	Based on regression
Average estimated probability that establishment will rate access to finance as major obstacle					
All enterprises	0.474	0.428	0.383	-0.091	Table3, column 1
Small enterprises	0.470	0.408	0.387	-0.083	Table3, column 2
Medium enterprises	0.461	0.409	0.358	-0.103	Table3, column 2
Large enterprises	0.455	0.399	0.342	-0.113	Table3, column 2

NOTES: Based on the regression result in the table3, insert the real value of all the variables except for concentration. Each time use 25%, 50% and 75% of concentration and calculate the probably that firm will evaluate the external financing as major obstacle (financing obstacle=4).

The market share of the three largest banks is only one dimension of the competitiveness of the banking sectors. In table 5, we gradually incorporate indicators of the regulatory restriction and again, interact them with concentration while holding GDP per capita constant. In column 1, the correlation between institutional development and financing obstacles is significantly positive, indicating that government interference in the banking systems improves the financing conditions, especially after financial crisis, when regulation on banking systems are stricter and require more capital and limitations regarding lending to firms. Both concentration and its interaction with institutional development become significantly negative, and the size of coefficients indicate that there doesn't exist any country with institutional development index that can offset the concentration effect on financing obstacle.

The banking freedom variables also provide the closest measure of how freely the financial institution can operate without government interference. Column 2 shows that both the concentration and banking freedom enter positively and significantly, while the interaction with concentration is significantly negative. The magnitude of the coefficients demonstrate that less government interference in banking can decrease the relation of concentration with financing obstacles and that there is positive relation between concentration and financing obstacles if banking freedom is less than Eritrea (38.49). We also look at fraction denied and restrict. All of the coefficients pass the 1% significance test. Restrict (Column 3) enters positively as concentration, whereas the interaction enter negatively which means more restrictions on the banking activities can dampen the association between market structure and financing obstacle. The regression on fraction denied conveys the similar idea as concentration and fraction denied enter negatively while their interaction enter contrarily. The result can be understood that the banking concentration put no effect on the financing obstacle in a country with almost half of the application to enter banking being denied. The credit registry can't indicate anything as it doesn't pass significance test, but its interaction with banking concentration suggest a more well-functioned credit registry system tend to weaken the link between banking centralization and the difficulty of external financing.

Table 5

Concentration and Financing Obstacles—the Interaction with the Regulation of the Banking Sector

	Financing Obstacles	Financing Obstacles	Financing Obstacles	Financing Obstacles	Financing Obstacles
Concentration	-1.330	1.769	3.407	-0.904	-0.639
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
GDP per capita	-0.339	-0.273	-0.250	-0.231	-0.371
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Institutional development	0.892				
	(0.000)***				
Concentration*	-0.712				
Institutional development	(0.000)***				
Banking freedom		0.028			
		(0.000)***			
Concentration*		-0.047			
Banking freedom		(0.000)***			
Restrict			0.163		
			(0.000)***		
Concentration*			-0.384		
Restrict			(0.000)***		
Fraction Denied				-0.895	
				(0.000)***	
Concentration*				2.116	
Fraction Denied				(0.000)***	
Credit registry					-0.006
					(0.971)
Concentration*					0.848
Credit registry					(0.001)***
R-square	0.1348	0.1187	0.1281	0.1159	0.115
Observation	12933	12933	12933	12933	12933

NOTES: The equation is financing obstacle $= \alpha + \beta_1 \text{domestic} + \beta_2 \text{government} + \beta_3 \text{foreign} + \beta_4 \text{manufacturing} + \beta_5 \text{service} + \beta_6 \text{sales} + \beta_7 \text{competition} + \beta_8 \text{inflation} + \beta_9 \text{growth} + \beta_{10} \text{concentration} + \beta_{11} \text{GDP per capita} + \beta_{12} \text{regualation} + \beta_{13} \text{regulation} * \text{concentration} + \varepsilon$. Financing obstacle is the numerical response of the question: In access to financing, which includes availability and cost (interest rates, fees and collateral requirements), how much obstacle is there to the current operations of this establishment? Domestic, Government and Foreign are dummy variables that take on one if the firm is owned by domestic, government or foreign organization. Manufacture and service takes on one if firm operates in manufacturing or service industry, 0 if not. Sale is the natural logarithm of 2011 firm data. Competition is the numeric response of question: "Do you think that the practices of competitors in the informal sector are No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?" Concentration is share of 5 largest banks in banking system in terms of both deposits. Restrict is the measure of the extent to which the bank financial activities. Banking freedom is the degree of government interference in the banking system. Inflation rate takes the value of 2011. Credit Registry is the number of individuals and firms listed in private or public registry as share of population. Institution development is the average indicator of

voice and accountability, regulatory quality, rule of law, control of corruption, political stabilities, and effectiveness of government respectively. Fraction denied is the indicator of government's restriction to enter the bank sector. The p-value of coefficient is reported in bracket. *, ** and *** express significance level of 1%, 5% and 10%.

Further, we control for financial intermediary development and the ownership structure of banking systems, and interact these variables with bank concentration (Table 6). The negative concentration and the positive interaction with private credit indicates that development of financial intermediary can turn the relation between market structure and financing obstacle from negative to positive, and an appropriate level of private credit can eventually eliminate the association. While the concentration doesn't enter significantly, its interaction with foreign bank share enters significantly and negatively, suggesting that the presence of foreign banks makes firms face fewer financing obstacles in more concentrated countries. On the other hand, the interaction of bank concentration with public bank share enters positively, indicating that public bank ownership improves the level of financing obstacles. It can be reasonable if the local banks can take the advantage of foreign countries' advanced financial practice and apply them into the financing process. With more comprehensive knowledge in conducting loans, banks gain the incentives to expand the amount of borrowers and increase the efficiency of lending.

Table 6
Concentration and Financing Obstacles—the Interaction with the Structure of the Banking Sector

	Financing Obstacles	Financing Obstacles	Financing Obstacles
Concentration	-2.842	0.228	-1.155
	(0.000)***	(0.235)	(0.000)***
GDP per capita	-0.122	-0.273	-0.269
	(0.000)***	(0.000)***	(0.000)***
Private Credit	-3.300		
	(0.000)***		
Concentration*	3.770		
Private Credit	(0.000)***		
Foreign bank share		1.190	
		(0.000)***	
Concentration*		-1.615	
Foreign bank share		(0.000)***	
Public bank share			-2.346
			(0.000)***

Concentration* Public bank share			3.848 (0.000)***
R-square	0.1265	0.1157	0.1116
Observation	12933	12933	12933

NOTES: The equation is financing obstacle = $\alpha + \beta_1$domestic + $\beta_2$government + $\beta_3$foreign + $\beta_4$manufacturing + $\beta_5$service + $\beta_6$sales + $\beta_7$competition + $\beta_8$inflation + $\beta_9$growth + β_{10}concentration + β_{11}GDP per capita + β_{12}Bank + β_{13}Bank $*$ concentration + ε. Financing obstacle is the numerical response of the question: In access to financing, which includes availability and cost (interest rates, fees and collateral requirements), how much obstacle is there to the current operations of this establishment? Domestic, Government and Foreign are dummy variables that take on one if the firm is owned by domestic, government or foreign organization. Manufacture and service takes on one if firm operates in manufacturing or service industry, 0 if not. Sale is the natural logarithm of 2011 firm data. Competition is the numeric response of question: "Do you think that the practices of competitors in the informal sector are No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?" Concentration is share of 5 largest banks in banking system in terms of both deposits. Private credit refers to the financial credit offered to private sector by financial institution as share of GDP. Foreign bank share measures the percent of the banking system's assets in banks that are foreign-controlled and public bank share describes the percent of the banking system's assets in banks that are public-controlled. The p-value of coefficient is reported in bracket. *, ** and *** express significance level of 1%, 5% and 10%.

TABLE 7
Comprehensive Regression on Concentration and Financing Obstacles

	Financing Obstacle	P-value		Financing Obstacle	P-value
Domestic	0.317	(0.000)***	Banking Freedom	-0.066	(0.000)***
Foreign	-0.010	0.878	Banking Freedom* Concentration	0.082	(0.001)***
government	-0.063	0.596	Restrict	0.129	(0.039)**
Manufacturing sector	0.087	(0.000)***	Restrict* Concentration	-0.311	(0.002)***
Service sector	-0.099	(0.000)***	Fraction Denied	-0.184	0.622
sales	-0.037	(0.000)***	Fraction Denied* Concentration	0.155	0.840
Competition	0.206	(0.000)***	Credit Registry	-1.683	(0.001)***
inflation rate	0.497	0.604	Credit Registry* Concentration	3.371	(0.000)***
GDP growth rate	-0.627	0.150	Private Credit	-9.180	(0.000)***
Concentration	11.284	(0.008)***	Private Credit* Concentration	14.561	(0.000)***
log(GDP)	1.162	(0.010)***	Foreign Bank Share	1.617	(0.082)*
log(GDP)* Concentration	-2.686	(0.000)***	Foreign bank Share* Concentration	-1.508	0.259
Institutional Development	0.383	0.491	Public Bank Share	1.077	0.642
Institutional Development* Concentration	0.218	0.834	Public Bank Share* Concentration	0.708	0.848

We also put all variables into regression so as to explore if any variable has significant effect on financing obstacles. From table 7, we can see the interaction coefficient of Private Credit, Credit Registry and GDP with concentration enter significantly, while the interaction of coefficient of Banking Freedom and Restrict with concentration enter insignificantly. We can attain the same relation between private credit interacted with concentration and financing obstacles that an appropriate level of private credit can eventually eliminate the association between concentration and financing obstacles. Also, banking freedom and restrict do not have much influence on the relation between concentration and financing obstacles.

Conclusions

Our paper analyzed the relationship between competition in banking systems and financing obstacles faced by firms. We conclude that with more bank concentration firms face fewer financing obstacles, and large enterprises can access credit easier than small and medium enterprises. When we include GDP per capita and an interaction with bank concentration, we find that enterprises face fewer financing obstacles in higher GDP per capita when the level of concentration is the same. In line with the original paper, we also find that the level of economicdevelopment, regulatory and institutional country characteristic as well as the ownership structure of the banking system influence the relation between bank concentration and financing obstacles. A high level of institutional development and the presence of foreign-owned banks dampen the effect of banking concentration on financing obstacles. On the other hand, the relationship is exacerbated in countries with more restrictions and limitations on banks' activities, higher government interference in the banking system and more government-owned banks.

Our results provide evidence for theories that focus on the potential positive effects of bank concentration which is inconsistent with theories that stress the negative effects of bank power. 54% of countries in our sample are emerging countries, where banking systems are inefficient and more concentration provides comparative advantage in monitoring, flexible lending and intertemporal consumption smoothing which is trivial for economic development.

More research is clearly needed on the topic of bank concentration and competition. One useful direction for future research is likely to be additional focus on developing countries and their problems of credit availability, economic growth and financial stability. Along these lines, more detailed analyses of how regulatory and supervisory policies influence bank and overall

economic performance may provide policy makers with considerably improved information for formulating banking sector policies.

The results of the paper have relevance for developing economies and emerging economies, where there are government-sponsored programs or micro banking, which affect credit market structure, aim at providing higher levels of welfare.

Literature Cited

Cetorelli, N., & Gambera, M. (n.d.). Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data. The Journal of Finance, 617-648.

Beck, Thorsten, and Ross Levine (2002). "Industry Growth and Capital Allocation: Does Having a Market- or Bank-based System Matter?" Journal of Financial Economics 64, 147–180.

Beck, Thorsten, Asli Demirgu¨c¸-Kunt, and Vojislav Maksimovic (2001a). "Financial and Legal Constraints to Firm Growth: Does Size Matter?" World Bank Policy Research Working Paper No. 2784.

Beck, Thorsten, Asli Demirgu¨c¸-Kunt, and Vojislav Maksimovic (2001b). "Financial and Legal Institutions and Firm Size." Mimeo, World Bank.

Beck, Thorsten, Ross Levine, and Norman Loayza (2000). "Finance and the Sources of Growth." Journal of Financial Economics 58, 261–300.

Barth, J., & Caprio, G. (2001). The regulation and supervision of banks around the world: A new database. Washington, DC: World Bank, Development Research Group, Finance, and Financial Sector Strategy and Policy Dept.

Clarke, G., & Cull, R. (2001). Does foreign bank penetration reduce access to credit in developing countries? Evidence from asking borrowers. Washington, D.C.: World Bank, Development Research Group, Finance.

Black, S., & Strahan, P. (n.d.). Entrepreneurship and Bank Credit Availability. The Journal of Finance, 2807-2833.

Cetorelli, N. (n.d.). Real Effects of Bank Competition. Journal of Money, Credit, and Banking, 543-558.

Cetorelli, N., & Strahan, P. (n.d.). Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets. The Journal of Finance, 437-461.

Black, S., & Strahan, P. (n.d.). Entrepreneurship and Bank Credit Availability. The Journal of Finance, 2807-2833.

Petersen, M., & Rajan, R. (1995). The Effect of Credit Market Competition on Lending Relationships. The Quarterly Journal of Economics, 407-443.

Claessens, S., & Laeven, L. (n.d.). Financial Dependence, Banking Sector Competition, and Economic Growth. Journal of the European Economic Association, 179-207.

Pasiouras, F. (n.d.). International evidence on the impact of regulations and supervision on banks' technical efficiency: An application of two-stage data envelopment analysis. Review of Quantitative Finance and Accounting, 187-223.

Barth, J., Caprio, G., & Levine, R. (2013). Bank regulation and supervision in 180 countries from 1999 to 2011. Journal of Financial Economic Policy, 111-219.

Demirgu¨c¸-Kunt, Asli, and Vojislav Maksimovic (1998). "Law, Finance, and Firm Growth."

Journal of Finance 53, 2107–2137.

Demirgu¨c¸-Kunt, Asli, Luc Laeven, and Ross Levine (2003). "Regulations, Market Structure,

Institutions, and the Cost of Financial Intermediation." Journal of Money, Credit, and

Banking 36, 593–622. (This issue of JMCB)

Rajan, Rhaguram, and Luigi Zingales (1998). "Financial Dependence and Growth." American

Economic Review 88, 559–587.

Petersen, M., & Rajan, R. (1995). The Effect of Credit Market Competition on Lending Relationships. The Quarterly Journal of Economics, 407-443.

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton (1999). "Governance Matters."

World Bank Policy Research Working Paper No. 2196.

Guevara, J., & Maudos, J. (n.d.). Explanatory Factors of Market Power in the Banking System. The Manchester School, 275-296.