Bank Concentration and Financial Development: The Cross-country Evidence

Siong Hook Law and Ahmad Zainuddin Abdullah***

Concentration on banking industry may have long-lasting implication on financial market development. Some argue that concentration in the credit market introduces inefficiencies that would harm a firm's access to credit, thus hindering growth. On the other hand, some recent studies point out that some degree of monopoly power in banking is natural and beneficial. This study examines the effect of bank concentration on financial development, using a cross-country analysis on 68 economies during the period 1990-2001. The empirical results indicate that bank concentration is not a statistically significant determinant of financial development. Among the determinants of financial development, real income and institutional quality are the most prominent ones. The results suggest that concentration in the banking industry is positively associated with financial development in the lower middle-income and low-income countries. However, no such association is reported for upper-middle income countries. Therefore, the effect of bank concentration on financial development is subject to the level of economic development.

1. Introduction

The recent theoretical literature on finance and economic development establishes that financial development is positively associated with long-run economic growth. Various models within this literature predict that the development of financial intermediation services contributes to growth since, by creating liquidity and risk diversification opportunities and mitigating informational asymmetries by means of monitoring and screening technologies, it favors the allocation of financial resources toward the most productive investment projects[1]. An extensive amount of empirical work offers support for this leading view. For example, King and Levine (1993a, 1993b) present the first broad, cross-country analysis of the

* Faculty Member, Economics and Management, Department of Economics, Universiti Putra Malaysia, Selangor, Malaysia. He is the corresponding author. E-mail: lawsh@econ.upm.edu.my

** Faculty Member, Economics and Management, Department of Economics, Universiti Putra Malaysia, Selangor, Malaysia.

[1] Greenwood and Jovanovic (1990), Bencivenga and Smith (1991, 1993), King and Levine (1993b), Roubini and Sala-i-Martin (1995), Demetriades and Hussein (1996) and Boyd and Smith (1998), Honohan (2004), are the key examples of this strand of literature.

importance of various indicators of financial development. They find that there is a strong relationship between initial financial development and subsequent growth. Also using cross-country regression analysis, Levine and Zervos (1998) make an important refinement by showing the joint, independent relevance for growth of both banks and capital markets. Rajan and Zingales (1998) demonstrate that financial development can have a causal role in the growth process. Levine (2003) provides an excellent overview of a large body of empirical literature that suggests that financial development can robustly explain differences in economic growth across countries.

Recent empirical studies demonstrate that the positive association between finance and growth appears to vary with the stage of economic development. It seems to be potent for middle-income countries, while low-income countries appear to benefit the least from financial development, particularly where institutions are weak (Rioja and Valev, 2004; Demetriades and Law, 2004). If financial development is to facilitate poverty reduction worldwide, it is vital that its effectiveness, particularly in low-income economies, be enhanced. Therefore, it is critical to sharpen our understanding of both the sources and effectiveness of financial development at various stages of development. Numerous sources that have an influence on financial market have been identified in the literature so far, such as country's legal system origin (La Porta et al., 1997, 1998), good institutional quality (Demetriades and Andrianova, 2004; Chinn and Ito, 2002 and 2004) and openness (Rajan and Zingales, 2003).

Comparatively less attention has been paid, so far, to the issue of whether the development of financial markets is affected by concentration of banking industry. The traditional argument suggests that any departure from perfect competition in the credit market introduces inefficiencies that would harm firms' access to credit, thus hindering growth. According to this view, bank concentration will be negatively associated with measures of banking sector efficiency and financial development. On the other hand, some recent contributions have pointed out that some degree of monopoly power in banking is natural and beneficial. Petersen and Rajan (1995) argue that banks with monopolistic power have greater incentives to incur the costs associated with overcoming informational barriers, which then facilitates the flow of credit to worthy enterprises. An alternative view focuses the importance of increasing returns to scale in the production of banking services. With increasing returns, greater concentration may increase bank efficiency through more efficient scale, organization, management, and product mix. According to this view, bank concentration will be positively correlated with measures of banking sector efficiency and financial development.

The empirical evidence on the links between bank concentration and financial development does not suggest an unambiguously positive or negative relationship between both variables. For example, Demirgüç-Kunt and Levine (2000) find that bank concentration is negatively associated with financial development, but it is not statistically significant. Beck et al. (2003a) also demonstrate that there is no relationship between bank concentration and financial development. On the other hand, Levine (2000) points out that greater bank concentration is not strongly associated with negative outcomes in terms of financial sector development, industrial competition, political and legal system integrity, economic growth,

or banking sector fragility. Cetorelli and Gambera (2001) show that banking sector concentration exerts a depressing effect on overall economic growth, though it promotes the growth of industries that depend heavily on external finance. Cetorelli (2001) finds that bank concentration will enhance industries' market concentration, especially in sectors that are highly dependent on external finance. However, such effect is weaker in countries characterized by higher overall financial development.

The objective of this study is to examine the effect of bank concentration on financial development. So far much research has been conducted to examine the link between bank concentration with economic growth and industrial growth, but the relationship between bank concentration and financial development have not received much empirical treatment. This study predicts that bank concentration will have a positive impact on financial development in low-income economies. This is because these economies normally have more concentrated banking market, which will provide higher credit availability.

The paper is organized as follows: Section 2 explains the empirical model and the data employed in the analysis and Section 3 reports and discusses the econometric results. Finally, Section 4 summarizes and concludes.

2. Methodology and the Data

The theoretical literature predicts financial development to be a positive function of real income and the real interest rate. This is based on McKinnon-Shaw type models and the endogenous growth literature. In the model of McKinnon (1973), the positive relationship between financial development and the level of output results from the complementarity between money and capital. It is assumed that investment is lumpy and self-financed and hence cannot be materialized unless adequate savings are accumulated in the form of bank deposits. In the model of Shaw (1973), financial markets, through debt intermediation, promote investment which, in turn, raises the level of output. A positive real interest rate, in these models, promotes financial development through the increased volume of financial saving mobilization and stimulates growth through increasing the volume and productivity of capital. Higher real interest rates exert a positive effect on the average productivity of physical capital by discouraging investors from investing in low return projects (Fry, 1997). The endogenous growth literature also predicts a positive relationship between financial development, real income and the real interest rate (King and Levine; 1993a, 1993b). Based on these theoretical postulates, a financial development relationship can be specified as:

$$FD = f(RGDPC, R) \quad \cdots(1)$$

where, FD is financial development, RGDPC is the real GDP per capita, and R is the real interest rate.

Recently, the role of institutions in influencing financial development has also received attention in the literature (Acemoglu et al., 2001). Arestis and Demetriades (1997) suggest that differences between finance-growth causal patterns may reflect institutional differences. Chinn and Ito (2002) find that financial systems with a higher degree of legal/institutional development on average benefit more from financial liberalization than those with a

lower one[2]. Demetriades and Andrianova (2004) argue that the strength of institutions, such as financial regulation and the rule of law, may determine the success or failure of financial reforms. Therefore, Equation (1) is extended to incorporate institutions. Bank concentration is also included in order to examine the effect of bank concentration on financial development. Thus, the financial development equation in this study is extended as follows:

$$\ln FD_i = D + \beta_1 \ln RGDPC_i + \beta_2 R_i + \beta_3 \ln INS_i + \beta_4 \ln BC_i + \mu_i \quad \cdots(2)$$

where, INS is institutional quality and BC is bank concentration.

In order to examine the effect of bank concentration on financial development at different stages of economic development, Equation (2) (that includes the interaction term between bank concentration and the dummy variable of economic development) is also estimated in the model as follows:

$$\ln FD_i = D + \beta_1 \ln RGDPC_i + \beta_2 R_i + \beta_3 \ln INS_i + \beta_4 \ln BC_i + \beta_4 (\ln BC_i \times MCD) + \beta_4 (\ln BC_i \times LCD) + \mu_i \quad \cdots(3)$$

where MCD and LCD are the dummy variables of middle income countries and low income countries, respectively.

Equations (2) and (3) provide the basis for the empirical models that are estimated in this paper, which is estimated by using the cross-country OLS analysis.

The Data

The data set consists of 68 cross-country evidences (see Exhibit 1), averaged over the 1990-2001 period. Two groups of financial development indicators are employed in the analysis—banking sector development and capital market development. The three conventional variables to measure the banking sector development are liquid liabilities,

Exhibit 1: List of Countries

No.	Country	No.	Country
1	Australia	35	Korea
2	Austria	36	Lesotho
3	Bahrain	37	Malaysia
4	Belgium	38	Mali
5	Botswana	39	Mauritius
6	Cameroon	40	Mexico
7	Canada	41	Nepal
8	Chile	42	The Netherlands
9	Colombia	43	New Zealand
10	Congo	44	Nigeria
11	Cote d'Ivoire	45	Norway
12	Cyprus	46	Panama
13	Denmark	47	Papua New Guinea
14	Dominican Rep	48	Peru
15	Ecuador	49	Philippines
16	Egypt	50	Portugal
17	El Salvador	51	Senegal
18	Finland	52	Sierra Leone
19	France	53	Singapore
20	Germany	54	South Africa
21	Ghana	55	Sri Lanka
22	Greece	56	Swaziland
23	Guatemala	57	Sweden
24	Guyana	58	Switzerland
25	Honduras	59	Tanzania
26	India	60	Thailand
27	Indonesia	61	Togo
28	Ireland	62	Tunisia
29	Israel	63	Turkey
30	Italy	64	United Kingdom
31	Jamaica	65	United States
32	Japan	66	Uruguay
33	Jordan	67	Venezuela
34	Kenya	68	Zambia

Source: The World Bank, World Development Indicators-2003.

[2] The empirical relationship between financial liberalization and financial crises depends strongly on a country's institutional environment (Demirgüç-Kunt and Detragiache, 1998).

private sector credit and domestic credit provided by banking sector, whereas the two variables to represent capital market development are stock market capitalization, and number of companies listed. All these financial development variables are expressed as ratios to GDP except for the number of companies listed, which is divided by total population. The main sources of these annual data are the World Development Indicators (see World Bank CD-ROM 2003) and Beck et al. (2003b).

Annual data on real GDP per capita and real deposit interest rate (deflated by inflation) are obtained from the World Development Indicators (see World Bank CD-ROM 2003) and International Financial Statistics (IFS). The real GDP per capita is converted to US dollars (based on 1995 constant prices).

The institutions data set employed in this study was assembled by the IRIS Center of the University Maryland from the International Country Risk Guide (ICRG)—a monthly publication of Political Risk Services (PRS). Following Knack and Keefer (1995), five PRS indicators are used to measure the overall institutional environment, namely: (i) Corruption, which reflects the likelihood that officials will demand illegal payment or use their position or power to their own advantage; (ii) Rule of Law, which reveals the degree to which citizens are willing to accept established institutions to make and implement laws and to adjudicate dispute. It can also be interpreted as a measure of 'rule obedience' (Clague, 1993) or government credibility; (iii) Bureaucratic Quality, which represents autonomy from political pressure, strength, and expertise to govern without drastic changes in policy or interruptions in government services as well as the existence of an established mechanism for recruitment and training of bureaucrats; (iv) Government Repudiation of Contracts, which describes the risk of a modification in a contract taking place due to change in government priorities; and (v) Risk of Expropriation, which reflects the risk that the rules of the game may be abruptly changed. The first three variables are scaled from 0 to 6, whereas the last two variables are scaled from 0 to 10. Higher values imply better institutional quality and vice versa. The institutions indicator is obtained by summing the above five indicators[4].

The bank concentration is measured by the ratio of total assets of the three largest banks in each country to total banking sector assets, which is obtained from Beck et al. (2003b)[5]. This variable captures the degree of concentration in the banking industry. As reported in Table 1, banking systems around the world tend to be quite concentrated, with a mean of 71%. However, there is wide variation in the sample, with concentration levels ranging from less than 20% for the US to 100% for many African countries, such as Congo, Guyana, Lesotho, Sierra Leone, Tanzania, and Togo. Besides, as shown in Table 1, there is considerable variation among financial development indicators. Japan has the highest liquid liabilities, private sector credit and domestic credit; Sierra Leone has the lowest liquid liabilities and private sector credit, whereas Swaziland has the lowest domestic credit.

Table 2 reports the correlation results and this also reveals that bank concentration is negatively correlated with the banking sector development indicators. For example, the

[4] The scale of corruption, bureaucratic quality and rule of law was first converted to 0 to 10 (multiplying them by 5/3) to make them comparable to the other indicators. All these five indicators have high correlation, range between 0.73–0.92. For robustness checks, we also used different weights for each indicator to construct the aggregate index. The estimates are similar and are available on request.

[5] Demirgüç-Kunt and Levine (2000), Levine (2000) and Beck et al. (2003a) have employed this data set in the empirical analysis.

Table 1: Descriptive Statistics					
	N*	Mean	Standard Deviation	Maximum	Minimum
Liquid Liabilities (LIQ)	68	52.81	33.58	185.45	13.53
Private Sector Credit (PRI)	68	51.41	69.64	196.44	3.27
Domestic Credit (DOC)	67	68.77	49.52	271.04	6.14
Stock Market Capitalization (MC)	58	36.63	38.76	180.30	0.90
Number of Companies Listed (NC)	41	0.0019	0.0019	0.0085	8.80
Real GDP Per Capita (RGDPC)	68	9268.60	11642.58	44248.85	181.45
Real Interest Rate (R)	76	0.09	0.92	0.45	–5.05
Institutional Quality (INS)	64	34.69	9.97	49.84	16.67
Bank Concentration (BC)	68	71.00	22.00	100.00	19.00
* N = Number of Observations.					

correlation results between bank concentration and liquid liabilities, private sector credit and domestic credit are –0.26, –0.36 and –0.25, respectively. There is a weak negative correlation between bank concentration and stock market capitalization as well, but the correlation is positive with number of companies listed. Table 3 presents the correlation results when the sample countries are divided into three groups based on economic development, namely high-income, upper-middle income, and lower-middle and low-income groups. The correlation results demonstrate that bank concentration has weak negative correlation with financial development in high-income economies; the correlations in middle-income economies are slightly higher than high-income economies, but the correlation between bank concentration and number of companies listed is positive. On the other hand, the correlation between bank concentration and financial development is positive in the lower-middle income and low-income economies, namely, private sector credit, domestic credit and number of companies listed; it remains negative correlation with liquid liabilities and stock market capitalization.

Table 2: Correlations							
Panel A: Banking Sector Development Indicators and the Determinant Variables							
	LIQ	PRI	DOC	RGDPC	R	INS	BC
LIQ	1.00	–	–	–	–	–	–
PRI	0.88	1.00	–	–	–	–	–
DOC	0.84	0.80	1.00	–	–	–	–
RGDPC	0.70	0.80	0.64	1.00	–	–	–
R	0.16	0.15	0.24	0.03	1.00	–	–
INS	0.66	0.74	0.66	0.86	0.12	1.00	–
BC	–0.26	–0.36	–0.25	–0.33	–0.02	–0.25	1.00
Panel B: Stock Market Development Indicators and the Determinant Variables							
	MC	NC	RGDPC	R	INS	BC	
MC	1.00	–	–	–	–	–	
NC	0.46	1.00	–	–	–	–	
RGDPC	0.39	0.51	1.00	–	–	–	
R	0.14	0.08	0.13	1.00	–	–	
INS	0.47	0.51	0.92	0.28	1.00	–	
BC	–0.22	0.21	–0.14	–0.05	–0.11	1.00	
Source: The World Bank World Development Indicators, 2003 and International Financial Statistics (IFS) Published by IMF.							

Table 3: Correlation between Bank Concentration and Financial Development at Different Income Groups					
Income Groups	**LIQ**	**PRI**	**DOC**	**MC**	**NC**
High-Income Group	–0.17	–0.27	–0.39	–0.14	–0.35
N	20.00	24.00	24.00	21.00	21.00
Middle-Income Group	–0.20	–0.48	–0.44	–0.51	0.37
N	12.00	12.00	12.00	9.00	5.00
Lower-Middle Income and Low-Income Groups	–0.16	0.22	0.08	–0.04	0.47
N	32.00	32.00	32.00	24.00	15.00
Source: The World Bank, World Development Indicators, 2003 and International Financial Statistics (IFS) Published by IMF.					

3. Empirical Results

Table 4 reports the empirical results of Equation (2) on the full sample of countries using the ordinary least squares with robust standard errors estimator, using alternative proxies for financial development. The adjusted R-squared suggests that the models explain about 50-68% of the variation in financial development.

As shown in Table 4, the sign of the estimated coefficients on real income is consistent with theory, which is positively associated with financial development. It is statistically significant determinant of two financial development indicators at conventional level, namely liquid liabilities and private sector credit. The sign of the estimated coefficients on real interest rate is positive in the three banking sector development indicators, but it is negatively associated with two capital market development indicators and statistically significant determinant of stock market capitalization. The institutional quality variable is positive and statistically significant in all models, which is consistent with Demetriades and Andrianova (2004).

The bank concentration variable is not significantly related to measures of financial development, except for number of companies listed, where bank concentration enters with a

Table 4: OLS Regression with Robust Standard Errors Dependent Variable: Financial Development					
	Liquid Liabilities	**Private Sector Credit**	**Domestic Credit**	**Market Capitalization**	**Number of Companies Listed**
Constant	0.78 (1.05)	–1.20 (–1.01)	–0.20 (–0.18)	–9.34 (–3.63)	–15.25 (–5.55)
Real GDP Per Capita	0.17 (2.73)***	0.29 (3.06)***	0.13 (1.68)*	0.26 (–0.09)	0.27 (1.61)
Real Interest Rate	0.07 (1.45)	0.08 (1.28)	0.12 (1.97)*	–0.08 (–2.10)**	–0.11 (–1.67)
Institutional Quality	0.47 (3.72)***	0.67 (3.52)***	0.91 (3.83)***	4.07 (3.94)***	1.79 (2.24)**
Bank Concentration	–0.09 (–0.59)	–0.33 (–1.54)	–0.07 (–0.42)	–0.34 (–1.20)	0.85 (2.06)**
R-square	0.60	0.68	0.55	0.49	0.56
N	64	68	68	54	41
Notes: Figures in the parentheses are the t–statistics. ***, ** and * denote significant at 1%, 5% and 10%, respectively.					
Source: The World Bank, World Development Indicators, 2003 and International Financial Statistics (IFS) Published by IMF.					

positive and significant coefficient. This finding is consistent with Demirgüç-Kunt and Levine (2000), Levine (2000) and Beck et al. (2003a), who point out that bank concentration is not significantly related to measures of financial intermediary and stock market development.

Table 5 reports the results of Equation (3) when the interaction terms between bank concentration and dummy indicator of economic development are included in the model specifications. The empirical results demonstrate that concentration in the banking industry is positively significant determinant of financial development in low-income economies, whereas it is negatively associated with financial development in middle-income economies. This finding suggests that there exists a different relationship between banking concentration and financial development depending on the level of economic development.

Table 5: OLS Regression with Robust Standard Errors Dependent Variable: Financial Development (Interaction between Income Group and Bank Concentration)

	Liquid Liabilities	Private Sector Credit	Domestic Credit	Market Capitalization	Number of Companies
Constant	1.18	–4.05	0.59	–12.68	–16.05
	(0.88)	(–1.98)	(0.36)	(–4.17)	(–4.04)
Real GDP Per Capita	0.18	0.18	0.12	–0.66	0.14
	(1.81)*	(2.19)**	(0.99)	(–2.31)**	(0.41)
Real Interest Rate	0.06	0.05	0.11	–0.11	–0.11
	(0.83)	(1.44)	(1.27)	(–2.48)**	(–1.20)
Institutional Quality	0.44	1.80	0.82	6.06	1.88
	(3.79)***	(2.28)**	(3.57)***	(4.36)***	(2.30)**
Bank Concentration	–0.58	–0.47	–0.45	–0.25	2.11
	(–1.45)	(–1.19)	(–1.02)	(–0.33)	(2.36)**
Upper Middle Income and Bank Concentration	–0.13	–0.22	–0.02	–0.20	–0.55
	(–0.09)	(–1.63)	(–0.06)	(–1.90)*	(–0.60)
Lower Middle and Low Income Groups and Bank Concentration	0.66	0.62	0.40	0.01	0.88
	(2.08)**	(2.29)**	(1.06)	(0.11)	(0.94)
R-square	0.50	0.67	0.54	0.50	0.58
N	64	68	68	54	41

Notes: Figures in the parentheses are the t-statistics. ***, ** and * denote significant at 1%, 5% and 10%, respectively.

Source: The World Bank, World Development Indicators, 2003 and International Financial Statistics (IFS) Published by IMF.

4. Conclusion

This paper provides empirical evidence evaluation on the effect of bank concentration on financial development in 68 countries, consisting of high-income, middle-income and low-income economies. The empirical results indicate that bank concentration is not statistically significant determinant of financial development. Among the determinants of financial development, real income and institutional quality are the most prominent ones. Nevertheless, when the analysis is conducted based on different income levels, the results suggest that greater concentration among banks is more likely to promote financial development in lower middle-income and low-income economies, which imply that the effect of bank concentration on financial development is subject to the level of economic development. Y

Reference # 42J-2006-06-03-01

References

1. Acemoglu D, Johnson S and Robinson J A (2001), "The Colonial Origins of Comparative Development: An Empirical Investigation", American Economic Review, Vol. 91, pp. 1369-1401.

2. Arestis P and Demetriades P (1997), "Financial Development and Economic Growth: Assessing the Evidence", Economic Journal, 107, 783-799.

3. Beck T, Demirgüç-Kunt A and Levine R (2003a), "Bank Concentration and Crises", World Bank Policy Research Working Paper 3041.

4. Beck T, Demirgüç-Kunt A and Levine R (2003b), A New Database on Financial Development and Structure. Word Bank Research Dataset—updated in 2003.

5. Cetorelli N (2001), "Does Bank Concentration Lead to Concentration in Industrial Sectors?" Federal Reserve Bank of Chicago Working Paper 2001-02.

6. Cetorelli N and Gambera M (2001), "Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data", Journal of Finance, 56, 617-648.

7. Chinn M and Ito, H (2002), "Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence", NBER Working Paper 8967.

8. Chinn M and Ito, H (2004), What Matter for Financial Development? Capital Control.

9. Demetriades P and Andrianova S (2004), "Finance and Growth: What We Know and What We Need to Know" in C Goodhart, (ed), Financial Development and Economic Growth: Explaining the Links, 38-65. Palgrave Macmillan, Basingstoke.

10. Demetriades P and Law S H (2004), "Finance, Institutions and Growth", University of Leicester Discussion Paper in Economics 04/5.

11. Demetriades P O and Hussein K (1996), "Does Financial Development Cause Economic Growth? Time Series Evidence from 16 Countries", Journal of Development Economics, 51, 387-411.

12. Demirgüç-Kunt A and Levine R (2000), "Bank Concentration: Cross-country Evidence", World Bank Global Policy Forum Working Paper.

13. Felix Rijoja and Neven Valev (2004) "Finance and the Sources of Growth at Various Stages of Economic Development", Economic Inquiry, OUP, Vol. 42 (1).

14. Fry, M J (1997), "In Defence of Financial Liberalization", Economic Journal, 107, 754-770.

15. Honohan P (2004), "Financial Development, Growth and Poverty: How Close are the Links?" in C Goodhart (ed), Financial Development and Economic Growth: Explaining the Links, 1-37. Palgrave Macmillan, Basingstoke.

16. King R G and Levine R (1993a), "Finance and Growth: Schumpeter Might be Right", Quarterly Journal of Economics, 108, 717-737.

17. King R G, Levine R (1993b), "Finance, Entrepreneurship and Growth", Journal of Monetary Economics, 32, 1-30.

18. La Porta R, Lopez-de-Silane F, Shleifer, A and Vishny R W (1997), "Legal Determinants of External Finance", Journal of Finance, 52, 1131-1150.

19. Levine R (2000), "Bank Concentration: Chile and International Comparisons. Central Bank of Chile", Working Paper No. 62.

20. Levine R (2003), "More on Finance and Growth: More Finance, More Growth?" Federal Reserve Bank of St. Louis Review, 85, 31-46.

21. McKinnon R I (1973), Money and Capital in Economic Development, Brookings Institution, Washington, DC.

22. Petersen M A and Rajan R G (1995), "The Effect of Credit Market Competition on Lending Relationships", Quarterly Journal of Economics, 110, 407-443.

23. Rajan R G and Zingales L (2003), "The Great Reversals: The Politics of Financial Development in the Twentieth Century", Journal of Financial Economics, 69, 5-50.

24. Rajan R G and Zingales L (1998), "Financial Dependence and Growth", American Economic Review, 88, 559-586.

25. Shaw E S (1973), Financial Deepening in Economic Development, Oxford University Press, New York.