

## Financial Depth – Financial Repression Linkage

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### **Abstract**

The impact of financial repression on financial depth is one of the important issues for monetary authorities. Hence, this study examines the empirical relationship between financial repression and financial depth based on McKinnon-Shaw hypothesis in two set of countries, including 43 lower middle income and 33 upper middle income countries during 1990 to 2008. Real interest rate and reserve ratio is used to measure financial repression and the method that is used in empirical analysis is Dynamic Panel Data (DPD) technique. The results show that reserve requirement and inflation have the negative and significant effect on financial depth in two set of countries. Also, the results indicate that nominal interest rate and economic development positively affect the level of financial depth. Thus, financial repression is an obstacle to financial depth and increase in nominal interest rate and reduce reserve ratio and inflation is suggested to encourage financial depth in two set of countries.

**Keywords:** Financial Depth; Financial Repression; Dynamic Panel Data.

### **1- Introduction**

New theories of endogenous economic growth suggest that financial development plays a potential role in the process of economic development. Schumpeter (1911) argued the financial intermediaries provide services that are essential for innovation and growth. He advocates that developed financial system leads to the financial resources move to the most productive. After seminal work of King and Levine (1993a) a large number of empirical works examine the relationship between the development of financial system and economic growth in around the world and determine

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that financial development in general leads to economic growth, as the financial intermediaries are more important than capital markets, (Choe and Moosa 1999).

King and Levine (1993a, b) used an endogenous growth model to examine how financial systems affect economic growth. According to their findings, better financial systems improve the possibility of successful innovation, thereby accelerating economic growth and development. Robinson (1952) argues that finance does not exert a causal impact on growth but economic growth associated by higher demand for financial services. Economic development leads to more financial institution, financial products and financial services that emerge to response the higher demand of financial services created by economic growth. Another group of studies, such as Demetriades and Hussein (1996) and Arestis and Demetriades (1997), have attempted to examine the causality between financial development and economic growth. Morck and Steiler (2005) argued that more developed financial system may be associated by better corporate governance and more efficient allocation of resources, but many counter examples have been observed in the histories, Ang and McKibbin (2007).

As seen from above literature finance-growth nexus has been one of the most vibrant research issues in economics in recent years. One factor that can influence the financial depth of countries is financial repression. As the positive role of finance depth on growth is already a stylized fact as verified by many theoretical and empirical studies, but effect financial repression on financial depth are scarce adequately addressed in the literature. Therefore, the study of financial depth and factors that can influence financial development is important to gain higher economic growth. However, less work has been done on factors that can influence financial depth after the study of Demetriades and Luintel (1997) in which they found that have found the financial liberalization, real interest rates, and economic development are important causes of financial development for India, there is a growing literature that attempts to examine the determinants of financial development using a cross country framework. Understanding how each type of financial sector policies affects financial depth has important policy implications. Especially, the role of central bank of countries in stabilizing the financial systems has recently been of considerable interest to academic

researchers and policy makers in the aftermath of financial crisis in several Asian economies.

Financial repression is high in developing and transforming economies. Government of these set of countries gain the revenue from repression through controlling the financial sector. The revenue from the financial repression can be gained from two sources: first, the interest rate ceiling allows the government to finance its government debt at a lower interest rate. Second, a system of reserve requirement on deposits increases the amount of base money and by that seignior age revenue. However, McKinnon (1973) and Shaw (1973) argued that financial repressions policies are largely accountable for the poor economic performance of developing countries, where credit rationing and low investment were prevalent. Their findings suggest that distortions in the financial systems, such as loans issued at an artificially low interest rate, directed credit programs, and high reserve requirements are all unnecessary. These can reduce saving, retard capital accumulation, and prevent efficient resource allocation. Shaw (1973) suggests that a high interest rate is needed to attract more saving. By rising supply of credit, financial intermediaries can promote investment through borrowing and lending that leads to rise in output growth. These ideas can be found in the Keynesian theories.

Given the above cases, the aim of this paper is to investigate the relationship between financial depth and financial repression based on McKinnon-Shaw hypothesis because, this subject that how financial repression effects on financial depth are scarce adequately addressed in the literature that is an important issue for monetary authorities. In addition, this study compares the results in two set of countries included, lower middle income and upper middle income countries, presented in appendix. The empirical research on this issue in this large panel is scarce, which authors are aware. In pursuing this aim, our study uses Dynamic Panel Data (DPD) technique.

The balance of the paper is organized as follow. Section 2 discussed the literature review and analytical framework of how financial depth, financial repression and other factors are related. Econometric issues, model specification and data are described in Section 3. The effects of real interest rate, economic development and financial repression on financial depth

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measured and explained in section 4. Final section provided concluding remarks and some policy implications.

### **2- Theoretical Issues**

Financial repression is a set of government regulations, laws and qualitative and quantitative restrictions that lead to prevent the financial intermediaries from their full capacity in the economy. The policies such as interest rate ceiling, liquidity ratio requirements, capital controls, restrictions on market entry into the financial sector, credit ceilings or restriction on direction of credit allocation, government ownership or domination of banks. In the economic framework argues that financial repression prevents the efficient allocation of capital and therefore it can reduce the economic growth. Gupta and Ziramba (2009) argued that financial repression consists of three elements: First, the banking system is forced to hold government bonds and money through the imposition of high reserve and liquidity ratio requirements because it allows the government to finance budget deficits at a low or zero cost. Second, the development of private bond and equity markets are discouraged. Third, the banking system is characterized by interest rate ceilings.

McKinnon (1973) and Shaw (1973) argued that many countries, especially developing countries have restricted competition in the financial sector with government interventions and regulations that this subject can discourages saving and investment. The cause of decrease in investment and saving is the lower return rate that obtained in these countries instead of return rate of competitive market. In this situation, bank credit is also equally reduced thereby resulting in low ratios of money supply to GNP which is a feature of developing countries. An increase in bank lending is a necessary condition for enlarging the real size of monetary system and therefore diminishing financial repression. McKinnon (1973) and Shaw (1973) suggested these polices may inversely affect the quality and quantity of investment and thus hinder financial development. Therefore, they called for the removal of these financial repressions policies in order to foster financial development.

In contrast, some evidences believe that liberalizing interest rate may not necessarily lead to higher financial depth. The results' Hellmann *et al.* (2000) show that an increase in banking competition as a result of

liberalizing the financial sector such as removing interest rate restraints could result in a weaker banking system. In addition, a significant increase in interest rates, which often follows from interest rate liberalization, is systematically related to financial crises (see Demirguc-Kunt and Detragiache, 1998). In fact, Stiglitz (1994) suggests that interest rate restraints may lead to higher financial saving in the presence of good governance in the financial system.

In the financial repression policies, unofficial money market (UMM) or curb markets give rise. The curb market set up an informal credit market, where moneylenders and indigenous banks intermediate between savers and borrowers, beyond the regulation of the monetary authority. This subject appears because this curb market doesn't need to reserve requirement, therefore it's obvious that it is a competitive and agile credit market and providing more efficient intermediation than the official banking system. Based on this literature we can expect curb market emerges as a residual market in banking system act under interest rate regulations and higher reserve requirement to absorb the excess demand for credit from the official banking system (Gupta, 2005).

From Arestis and Demetriades (1999a, b) point of view the financial liberalization hypothesis is based on a set of unrealistic assumptions, including perfect competition, perfect information, a sound institutional framework, and limited influence of stock markets. However, in countries with imperfect financial markets, certain government policies, which may include financial repression in the forms of that mentioned above, are able to address market failures and lead to higher financial development (Stiglitz, 1994). In addition, Mankiw (1986) suggests that government intervention such as providing a credit subsidy and acting as a lender for certain borrowers can substantially improve the efficiency of credit allocation. The findings of Arestis and Demetriades (1997) and Demetriades and Luintel (2001) showed that financial repression in Korea has a positive effect on financial development.

Financial deepening refers to the development of the financial sector. It promotes efficient credit allocation, risk reduction through diversified investment in financial intermediaries and the lowering of transaction costs of these intermediaries through information generation. As a result, financial deepening is believed to promote economic growth and thereby reduce

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inequality, (Kai and Hamory, 2009). There are three main definitions of financial depth: monetary aggregate to GDP ratio or monetization, debt to GDP ratio or indebtedness and stock market capitalization to GDP ratio. Although these three variables are the proxies for the same thing, they should be treated separately.

Pitzel and Uusküla (2007) argued that for monetary policy to operate, households and firms have to use money. The base money can be obtained from the (local) central bank. The more people use (local) money in their transaction, the more they are influenced by the decisions of that (local) central bank. Now, if interest rate is changed, only those using the central bank money will be directly influenced by that decision. In addition to the central bank money, commercial banks can create money by giving out loans. If there is more money, the more people to large extent are influenced by the interest rate. In a closed economy, higher monetization can take place only through giving out loans. In an open economy, the broad money and debt are less related and loans can be taken without necessarily increasing the stock of money. Financing can also be obtained directly from the stock markets and without using the banks as intermediaries.

The above definitions can phrase to the effect of financial depth on the monetary transmission. We can expect that controls on nominal interest rate lead to depressing of capital accumulation because this associate reduce in the real rate of return on bank deposits and discouraging financial saving. Bank portfolio decisions affect on level of nominal interest rates. Investment in productive capital will decrease in result of low nominal interest rates that lessens the opportunity cost of bank holdings of cash reserves. In essence, with low interest rates, money becomes “too good” of an asset, and banks have little incentive to make productive investments. This, in turn, prevents economic growth. In such cases, a monetary policy that adheres to the Friedman rule may be suboptimal, (Boyd and Champ, 2003).

In addition, more reserve requirements have negative effect on financial intermediation by the gap that appears between lending and deposit rates. Fry (1995) argued that this gap is an increasing function of the rate of inflation. More reserve requirement is associated with inefficiencies and delays in the payment system forcing the banking and financial sector to hold a larger amount of reserve money that otherwise would. Based on the endogenous growth literature, there are additionally channels that financial

sector policies can influence the financial development freely from interest rate. King and Levin (1993b) found that financial sector taxes – which may include interest rate ceiling or high reserve requirement – have a negative effect on financial intermediation. Bencivenga and Smith (1992) showed that higher reserve requirement can reduce the steady state values of the capital stock, output and bank deposits. Therefore financial policies can influence both the process of financial intermediation and the growth rate. More reserve requirement leads to absorb resources and this situation may be associated with inefficient intermediation. Also, it can affect the growth through the effect on the amount of resources devoted to accumulation.

The relationship between these instruments and financial deepening has been studied empirically by a number of investigators. Atukorala and Rajapatirana (1993) tested the McKinnon-Shaw hypotheses using Sri Lankan time series data on an annual basis for the period 1960-1987 with a dummy variable to represent policy changes in 1977. They confirmed the McKinnon-Shaw hypothesis that there is a positive relationship between interest rate and financial deepening. However they did not test the time series properties of data such as stationary and co integration. The results of Ang (2008) showed that economic development, interest rate controls, and capital liquidity requirements positively affect the level of financial development for the case of Malaysia over the period 1959–2005. Bittencourt (2011) found that inflation detrimental effects on financial development in Brazil.

Considering the literature it is clear that there is a relationship between financial repression and financial depth in the economy. However, the existence of the relation is obvious but there is no agreement among different economists regarding type of the relationship among these economic variables. Therefore, this study is tried to examine this subject empirically to investigate the effect of financial repression on financial depth in two set of upper and lower middle income countries. These two set of countries considered because this relationship may be different from lower middle income countries to upper middle income countries. In addition, the model that is used to estimation point is based on Demetriades and Luintel (1997) with some adjustments to examine the McKinnon-Shaw hypothesis.

### **3- Econometric Issues, Model Specification, and Data**

This section describes the econometric methodology as well as the model and data used in the empirical analysis. Valid tests of econometrics model require that the data be stationary (integrated of order zero) or if non-stationary (integrated of order one), cointegrated. Thus, our econometric methodology proceeds in three stages. First, we implement the panel unit root test proposed by Breitung (2000), to ascertain the order of integration of the variables. The reason for using this panel unit root test is that a recent large-scale Monte Carlo simulation study by Hlouskova and Wagner (2006) found that the Breitung (2000) panel unit root test generally had the highest power and smallest size distortion of any of the so called first generation panel unit root tests. Second, conditional on finding that all variables are integrated of order one we test for panel cointegration using the approach suggested by Kao (1999) based (Engle-Granger based), method. Third, conditional on finding cointegration we apply Dynamic Panel Data (DPD) to estimates of the coefficients of equation.

Dynamic Panel Data models estimated using the Generalized Method of Moments (GMM) estimator of Arellano and Bond (1991) which differs from static panel GMM estimators in the set of moment condition and the matrix of instruments. GMM technique controls for endogeneity of explanatory variables and it accounts for unobserved country specific effects, also it allows for inclusion of lagged dependent variables. Standard Arellano-Bond estimator is more efficient when instruments are strong that it test using Sargan statistic because this method used the information of first differences of variables only. Sargan statistic distributed as a Chi-square with degree of freedom instrument rank minus number of estimated coefficients and null hypothesis in this test is the over-identifying restrictions are valid.

The specification of the co-integration equation for financial depth is presented in equation (1). In this equation, logarithm of financial depth ( $\ln FD$ ) is a function of logarithm of real GDP per capita ( $\ln Y$ ); nominal interest rate ( $R$ ); inflation rate ( $P$ ) and reserve ratio ( $RS$ ) that used to measure financial repression. The empirical specification of the steady state equation for financial development in Eq.1 is based on Demetriades and Luintel (1997) that financial depth is a function of economic development, real interest rate, financial repression and population density of bank branches. Note that in this study real interest rate is broken to nominal interest rate and



inflation for analysis goals. The assumption that will be surveyed in this model is that economic agents may keep money either as an inventory to cover differences between income and expenditures or for its yield as an asset in a portfolio.

Financial depth is defined by the ratio of M2 to GDP, and real GDP per capita is used as the proxy of the real income. The nominal interest rate is nominal deposit rate. Inflation rate is the annual growth of consumer prices and reserve ratio is bank liquid reserve to bank assets ratio. The data are obtained from World Bank Database. The following linear equation model in semi-logarithmic form estimated:

$$\ln FD_t = \alpha_0 + \beta_0 \ln Y_t + \beta_1 R_t + \beta_2 P_t + \beta_3 RS_t + \varepsilon_t$$

It is important to point out that it is not unusual to include inflation rate as an explanatory variable in the money demand function. Some studies use current inflation rate and others use expected inflation rate as explanatory variable. Different studies deduce that monetary and non-monetary factors contribute to the inflation process. Huybens and Smith (1998, 1999) suggested that inflation may aggravate asymmetries of information in credit markets, reducing the real rate of return and the volume of credit. Consistent with these views, Boyd *et al.* (2001), Detragiache *et al.* (2005), Dehesa *et al.* (2007) and Bittencourt (2011) found that inflation can be negatively associated with measures of financial depth. Boyd *et al.* (2001) has been shown is that financial development is undermined by inflation. Chinn and Ito (2006) demonstrated that capital account openness and institutional environment have significant effects on equity market development for a panel of 108 countries and financial openness can support financial depth if the appropriate institutional requirements are in place. The cross country evidence of Rossi (1999) suggests that financial restraints can hamper financial development.

#### **4- Empirical results**

The starting point study is to examine integrational properties of series. The result of Breitung (2000) panel unit root test suggest that logarithm of financial development, logarithm of real GDP per capita and reserve ratio

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are integrated of order 1 and that their first differences are stationary. Also, the results show that nominal interest rate and inflation rate are integrated of order 0 and therefore, they are stationary. Having established that variables contain panel are unit roots, therefore we use Kao (1999) co-integration test to test whether there is a long-run relationship among variables or not. The results of Kao test showed that there is co-integration relationship among variables that included in the model. Now we can estimate model without worrying of estimated regression.

**Table 1: Breitung Unit Root Tests [Null Hypothesis: Unit Root (Common Unit Root Process)]**

Lower Middle Income Countries			Upper Middle Income Countries		
Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic
lnM	1.7786	0.9624	lnM	0.3651	0.6425
D(lnM)	-6.5225	0.0000*	D(lnM)	-4.0715	0.0000*
lnY	1.2371	0.8920	lnY	2.4626	0.9931
D(lnY)	-6.2579	0.0000*	D(lnY)	-4.4001	0.0000*
R	-2.2923	0.0109*	R	-2.9907	0.0014*
RS	-0.2839	0.3882	RS	-1.2445	0.1067
D(RS)	-6.7211	0.0000*	D(RS)	-7.2782	0.0000*
P	-3.7605	0.0001*	P	-4.7085	0.0000*

Note: \* Null hypothesis rejected at 5% significant level.

**Table 2: Kao Residual Co-Integration Test (Null Hypothesis: No Co-Integration)**

Lower Middle Income Countries			Upper Middle Income Countries		
	t-Statistic	Prob.		t-Statistic	Prob.
ADF	-5.7879	0.0000*	ADF	-3.6237	0.0001*

**Table 3: The Result of Estimated Models by Dynamic Panel Data Method**

Lower Middle Income Countries			Upper Middle Income Countries		
Variable	Coefficient	T-Statistic	Variable	Coefficient	T-Statistic
Ln(M(-1))	0.2200	4.9911*	Ln(M(-1))	0.3973	18.2398*
lnY	0.3949	7.2147*	lnY	0.3661	7.08205*
R	0.0048	10.1034*	R	0.0003	7.4928*
P	-0.0010	-5.7039*	P	-0.00099	-9.0423*
RS	-0.0008	-2.4369*	RS	-0.0012	-2.4873*
S.E of regression: 0.0873 Sum squared resid: 3.6060 J-statistic: 179.7086 Instrument rank: 158.0000 Sargan test (Prob.): 0.3012			S.E of regression: 0.1230 Sum squared resid: 7.3989 J-statistic: 160.5730 Instrument rank: 157.0000 Sargan test (Prob.): 0.0683		

Note: \* Null hypothesis rejected at 5% significant level.

The results indicate that a one percentage increase in real GDP per capita leads to 0.39% and 0.37% increase in financial development of lower and upper middle income, respectively. Therefore, higher per capita income due to increased demand for financial services and expansion of the financial system. This effect is greater in lower middle income countries rather than upper middle income countries. This positive coefficient between economic development and financial development supported Robinson's (1952) Hypothesis. The coefficients of reserve ratio that show financial repression in lower and upper middle income countries that a 1% increase in reserve ratio leads to 0.08% and 0.12% decrease in financial development of these set of countries, respectively. Furthermore these results supported the McKinnon-Shaw hypothesis that high reserve requirements delayed financial development. The estimated coefficients indicate that financial repression through increase in reserve ratio is more harmful in lower middle income countries rather than upper middle income countries.

The estimated coefficients for inflation rate showed that a 1% increase in inflation rate leads to 0.1% increase and 0.09% decrease in financial development of lower and upper middle income countries, respectively. Therefore, increase in inflation rate is harmful for financial development of upper and lower middle income countries but higher inflation rate in lower middle income countries is more harmful for financial development; these findings are consistent with Bittencourt (2011). This implies that inflationary environment by lowering money supply and restricting financial resources for investment projects deteriorates financial development. In addition, high inflation is related with high opportunity cost of holding money that decreases the efficiency of financial institutions and hence development of financial sector.

A one percentage point permanent reduction in the nominal rate of interest leads to estimated decline in financial depth of 0.48% and 0.03% in lower and upper middle income countries, respectively. Thus increase in nominal interest rate is more effective on financial development in lower middle income countries rather than upper middle income countries. Therefore, the real interest rate restraint imposed on the financial depth of lower and upper middle income countries.

## **5- Conclusion and Implication**

Finance–growth nexus has been one of the most vibrant research issues in economics in recent years. As the positive role of finance depth on growth is verified by many theoretical and empirical studies, but how financial repression impacts on financial depth are one of the important issues for monetary authorities that less adequately addressed in the literature. One of these factors that can influence the financial depth of countries is financial repression. In this study we examine the impact of financial repression on financial depth by using panel data of the lower and upper middle income countries over the period 1990 to 2008. The all data obtained from World Bank Indicator (WDI). The estimated method that used is panel data approach.

For estimation of model, at first we use the Breitung (2000) panel unit root test to establish the integrational properties of variables. The results of Breitung (2000) panel unit root test indicate that there are several unit root variables in the estimated equation. Therefore, employed panel Co-integration test by using Kao (1999) test that is Engle-Granger method based. The result of co-integration test shows that there is long-run relationship between variables, thus we can estimate model without worrying about of estimated regression. The method that used for empirical estimation is Dynamic Panel Data Method (DPD) using the Generalized Method of Moments (GMM).

In this study, real interest rate and reserve ration used to measure the financial repression. The main finding of this study is the higher reserve ratio has a negative impact on financial development of lower and upper middle income countries. This result supports the McKinnon-Shaw hypothesis that high reserve requirement delayed financial development. In addition reserve ratio on financial development is more harmful in upper middle income countries rather than lower middle income countries. Also the impact of inflation rate as an index of financial repression is negative in two set of countries. The results indicate that higher inflation rate is harmful for financial development in upper and lower middle income countries and it is more harmful in lower middle income countries.

The impact of nominal interest rate on financial development is positive in two set of countries. But nominal interest rate is more effective on financial development in lower middle income countries rather than upper

middle income countries. The coefficient of real GDP per capita supported Robinson's (1952) Hypothesis. Therefore, economic development leads to increased demand for financial services and expansion of the financial system. This effect is greater in lower middle income countries rather than upper middle income countries. The results suggest that economic development reduces interest rate restriction and reduces reserve ratio and that can encourage financial depth in two set of countries but it is more effective in lower middle income countries rather than upper middle income countries. Also, inflation reduction can encourage financial depth in upper and lower middle income countries but this effect is more observed in lower middle income countries.

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## Appendix

List of the countries			
Upper middle income		Lower middle income	
1. Algeria	DZA	1. Albania	ALB
2. Argentina	ARG	2. Angola	AGO
3. Belarus	BLR	3. Armenia	ARM
4. Botswana	BWA	4. Azerbaijan	AZE
5. Brazil	BRA	5. Belize	BLZ
6. Bulgaria	BGR	6. Bhutan	BTN
7. Colombia	COL	7. Bolivia	BOL
8. Costa Rica	CRI	8. Cameroon	CMR
9. Dominica	DMA	9. Cape Verde	CPV
10. Dominican Republic	DOM	10. China	CHN
11. Fiji	FJI	11. Congo, Rep.	COG
12. Gabon	GAB	12. Cote d'Ivoire	CIV
13. Jamaica	JAM	13. Djibouti	DJI
14. Libya	LYB	14. Ecuador	ECU
15. Lithuania	LTU	15. Egypt, Arab Rep.	EGY
16. Macedonia, FYR	MKD	16. El Salvador	SLV
17. Malaysia	MYS	17. Georgia	GEO
18. Mauritius	MUS	18. Guatemala	GTM
19. Mexico	MEX	19. Guyana	GUY
20. Namibia	NAM	20. Honduras	HND
21. Panama	PAN	21. Indonesia	IDN
22. Peru	PER	22. Iran, Islamic Rep.	IRN
23. Poland	POL	23. Jordan	JOR
24. Romania	ROM	24. Lesotho	LSO
25. Russian Federation	RUS	25. Maldives	MDV
26. Seychelles	SYC	26. Moldova	MDA
27. South Africa	ZAF	27. Mongolia	MNG
28. St. Kitts and Nevis	KNA	28. Morocco	MAR
29. St. Lucia	LCA	29. Nicaragua	NIC
30. St. Vincent and the Grenadines	VCT	30. Nigeria	NGA
31. Suriname	SUR	31. Pakistan	PAK
32. Uruguay	URY	32. Papua New Guinea	PNG
33. Venezuela, RB	VEN	33. Paraguay	PRY
		34. Philippines	PHL
		35. Samoa	WSM
		36. Solomon Islands	SLB
		37. Sri Lanka	LKA
		38. Swaziland	SWZ
		39. Syrian Arab Republic	SYR
		40. Thailand	THA
		41. Tonga	TON
		42. Ukraine	UKR
		43. Vanuatu	VUT