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FINANCIAL INTERMEDIATION AND ECONOMIC GROWTH

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The paper evaluates the relationship between financial intermediation and the economic growth in the developing economic systems. First, using dataset from 28 countries, between 2001 and 2010 we define a financial intermediation indicator applying EFA method. We use several dimensions of the financial intermediation: Domestic credit provided by banking sector (% of GDP); Domestic credit to private sector (% of GDP); Broad money (% of GDP); Market capitalization of listed companies (% of GDP). As a preliminary step, using Spearman rank-order co-variance analysis we test the correlation between variables and the result confirms in general a high correlation degree between the indicators. Secondly, we compare this financial intermediation indicator with some dimension of economic growth using three different methods, OLS (Ordinary Less Square), GLM (Generalized Linear Model) and QR (Quantile Regression), in order to check the robustness of the model. The result suggests that the financial intermediation as part of financial development is positively associated with economic growth.

Keywords: Financial Intermediation, Economic Growth, Financial Development.

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1. Introduction

This paper examines if one dimension of financial development in our case the financial intermediation, is influencing the economic growth in the developing economic systems.

We provided a methodology to formally evaluate the degree of financial intermediation development through calculating the degree of financial intermediation, and we test the impact of this degree on economic growth in an extended set of countries.

Our main research hypothesis can be synthesized as follows: *the financial sector characteristic, especially the depth and configuration of financial intermediation processes has a critical role on a long run economic growth in developing countries.*

The paper structure is: Sect*ion* 2 presents the literature review; *Section 3* describes the methodology; *Section 4* reports on the data used for the empirical tests and on the results of these tests. Some conclusions are formulated and some future research analytical directions are indicated in *Section 5*.

2. Literature Review

A large body of economic literature supports the premise that, in addition to many other important factors, the performance and long-run economic growth and welfare of a country are related to its degree of financial development.

The relationship between financial development and economic growth has received in the recent years close attention in the literature. Financial development is measured by factors such as size, depth, access, and the efficiency and stability of a financial system, which includes its markets, intermediaries, and range of assets, institutions, and regulations.

The higher the degree of financial development, the wider the availability of financial services that allows the diversification of risks. This increases the long-run growth trajectory of a country and ultimately improves the welfare and prosperity of producers and consumers that have access to financial services.

This positive association was illustrated by a large number of empirical studies. 80 years ago Schumpeter (1934) observed that financial markets play a significant role in the growth of the real economy by channeling funds from savers to borrowers in an efficient way to facilitate investment. The economy development can be generated extensively by growth in the amount of factor of production or alternatively, intensively by increasing the efficiency with which those factors are used. Thus, there are two options – increase in investment (accumulation of capital) and increase the efficiency of investment. It can be argued that in a closed economy the

investments mach the savings. As a consequence, savings is viewed as an important vehicle to increase growth. On the other hand the efficiency of investments, on the other hand, includes not only total factor productivity growth, but also the accumulation of other factors not included in physical capital and therefore not included in standard measures of investment. Currently the endogenous theory is focused on a broader concept of capital which includes the human capital as a key component.

Also, financial development affects economic growth in two ways. First, the development of domestic financial markets may enhance the efficiency of capital accumulation and second, financial intermediation may contribute to raise the saving rate and, thus, the investment rate. Goldsmith (1969) finds some positive correlation between financial development and the level of real GNP per capita and also argues that the process of growth has feed-back effects on financial markets by creating incentives for future financial development.

The World Economic Forum has undertaken a research initiative aimed at providing business leaders and policymakers with a common framework to identify and discuss the key factors in the development of global financial systems and markets. The Report was made in 2008, 2009 and 2010 and defines financial development as the factors, policies, and institutions that lead to effective financial intermediation and markets, as well as deep and broad access to capital and financial services. In accordance with this definition, measures of financial development are captured across seven pillars: 1. Institutional environment; 2. Business environment; 3. Financial stability; 4. Banking financial services; 5. Non-banking financial services; 6. Financial markets; 7. Financial access;

These seven pillars are grouped into three broad categories:

1. Factors, policies, and institutions: the “inputs” that allow the development of financial intermediaries, markets, instruments and services

2. Financial intermediation: the variety, size, depth, and efficiency of the financial intermediaries and markets that provide financial services

3. Capital availability and access: the “outputs” of financial intermediation as manifested in the size and depth of the financial sectors and the availability of, and access to, financial services

Also, McKinnon (1973) and Shaw (1973) note that financial deepening implies not only higher productivity of capital but also a higher saving rate and, therefore, a higher volume of investment. They argue that policies that lead to financial repression (control which result in a negative interest rate) reduce the incentive to save and as a direct result lower investment and growth. The conclusion of the study was that financial liberalization lead to a higher interest rate and in this was an increase of savings.

Related to financial intermediation, financial repression and economic growth, Roubini and Sala-I Martin (1992) develop a model in which financial repression becomes a tool that governments may use to broaden the base of the inflation tax. Thus, financial repression yields higher seigniorage to finance government expenditure. In an optimal taxation framework where the tax instruments at the government's disposal are the inflation tax and the income tax that is subject to tax evasion, Roubini and Sala-I Martin (1992) argue that high income tax evasion induces policymakers to repress the financial system and set high inflation rate in an attempt to generate higher revenues from the inflation tax. Since the financial repression reduces the productivity of capital and lower savings, it hampers growth.

King and Levine (1993) show that financial development is a good predictor of future growth. More recently, Levine (2000) and Beck (2000) confirmed the existence of a strong, positive contribution of the exogenous component of financial development to economic growth, using external instrumental variables estimations, and a GMM dynamic panel data estimation in order to overcome potential problems of endogeneity of financial development.

However, there are studies that show that the effect of financial development on growth depends in a non linear way on the level of income of countries (Gaytan, Ranciere 2004: 27): "This effect varies from negative in low-income countries to positive above a certain wealth threshold; it reaches a maximum among middle-income countries before declining for richer countries". Also DeGregorio and Giudotti (1995) shows that in a panel regression for Latin American countries financial intermediation is negatively linked with economic growth, and suggest that these results may reflect the negative effect of financial crises experienced by several countries in the region.

3. Data and Methodological Framework

Database includes 28 countries: Argentina, Armenia, Bangladesh, Brazil, Bulgaria, Chile, China, Costa Rica, Croatia, Czech Republic, Estonia, Georgia, Hungary, Indonesia, Jordan, Latvia, Macedonia FYR, Mauritius, Nepal, Panama, Peru, Philippines, Romania, Russian Federation, Singapore, South Africa, Sri Lanka, and Ukraine. The selected countries are considered developing economies according to the International Monetary Fund's World Economic Outlook Report, April 2012.

There are no cases of missing data as the observation periods of 10 years between 2001 and 2010 are completely covered.

We compute the average on each indicator over a 10 years' time span in order to capture the long run trend in data.

As a preliminary step, we test the correlation between variables using Spearman rank-order co-variance analysis and the result confirms in general a high correlation degree between the indicators.

Table 1
Covariance Analysis of Financial Intermediation Variables - Spearman Rank-order Co-variances

		Covariance	Correlation	t Statistic	Probability
Domestic credit provided by banking sector (% of GDP)	Broad money (% of GDP)	58.17	0.86	8.58	0.00
Domestic credit to private sector (% of GDP)	Broad money (% of GDP)	57.11	0.84	8.02	0.00
Domestic credit to private sector (% of GDP)	Domestic credit provided by banking sector (% of GDP)	62.02	0.92	11.69	0.00
Market capitalization of listed companies (% of GDP)	Broad money (% of GDP)	41.37	0.61	3.94	0.00
Market capitalization of listed companies (% of GDP)	Domestic credit provided by banking sector (% of GDP)	38.85	0.57	3.58	0.01
Market capitalization of listed companies (% of GDP)	Domestic credit to private sector (% of GDP)	35.81	0.53	3.18	0.02

Note: Dunn-Sidak multiple comparison adjusted probabilities; the test statistics and associated p-values reported are meant to test the hypothesis that a single correlation coefficient is equal to zero; degree of freedom adjusted.

Source: Own preparation.

In order to develop a synthetic indicator of characteristic condition of financial sector we use the Exploratory Factor Analysis (EFA). EFA is a method for explaining the covariant relationships amongst a number of observed variables in term of much smaller number of unobserved variables that are named factors. It is a variable reduction technique that identified the number of latent constructs and the underlying factors (the estimated factor ant the unique factor). Communality is the variance of observed variables accounted for a common factor. These

factors account for common variance in the data and not for a maximal amount of variance of observed variables. This distinction can be viewed as an important argument of choosing this technique against other, such as the Principal Component Analysis (PCA), which accounts for a maximal amount of variance in the observed variables. The key argument is that there are presumably more variables, which can influence the evolution of the considered dimension financial intermediation. Such hidden variables are not explicitly considered but can induce several types of exogenous distortions. However, if communalities are large enough, the results from EFA and PCA could be quite similar.

Several dimensions of the financial intermediation are considered:

a. Domestic credit provided by banking sector (% of GDP) - it measures banking sector depth and financial sector development in terms of size. Taking into consideration that in developing economies the banking system it is the dominant component in financial intermediation process we are using this indicator as o proxy for financial intermediation dimension.

b. Domestic credit to private sector (% of GDP) - relevance of this indicator arise from the fact that credit is an important link in money transmission especially in developing economies and is reflecting the efficiency of financial intermediation process. Private sector development and investment are critical for economic development and poverty reduction. Complementary with public sector efforts, private investment, especially in competitive markets, has tremendous potential to contribute to growth being the engine of productivity growth, creating productive jobs and higher incomes. The government is playing a complementary role of regulation, funding, and service provision, private initiative and investment and in this way can help providing the basic services and conditions that empower poor people, by improving health, education, and infrastructure.

c. Broad money (% of GDP) - calculated as the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper. The volume of the broad money is the result of the interaction of the banking system considering also the central bank, with the money-holding sector, including here households, companies (non financial), local administration and non-monetary financial intermediaries.

d. Market capitalization of listed companies (% of GDP) - the development of an economy's financial markets is closely related to its overall development. In our case, analyzing developing economies, commercial banks tend to dominate the financial system, while at higher levels domestic stock markets tend to become more active and efficient relative to domestic banks giving the structure of financial. Modern communications technology

and increased financial integration have resulted in more cross-border capital flows, a stronger presence of financial firms around the world, and the migration of stock exchange activities to international exchanges. Many firms in emerging markets now cross-list on international exchanges, which provides them with lower cost capital and more liquidity-traded shares. However, this also means that exchanges in emerging markets may not have enough financial activity to sustain them, putting pressure on them to rethink their operations.

The variables (10 years averages of the data) reflect: 1) the development of the banking sector (the first two variables); 2) the overall money supply (the third variable); 3) the development of the local capital market (the last variable). It should be noticed the fact that this descriptors of the financial intermediation status are placed on the supply-side of financial resources. The main argument for such approach consists in the thesis that for that the developing economies are often facing hard budgetary constraints due to the underdevelopment of the financial sector and thus the financial intermediation is a supply driven process.

In EFA framework, the observed variables are linear combinations of the underlying and unique factors. It is important to note that this technique can be use to explore the possible underlying factor structure of a set of measured variables without imposing any preconceived structure of the outcome (Child 1990). *Table 2* reports the results of an EFA analysis with the involved variables and the corresponding loadings.

Table 2
Exploratory Factor Analysis of Financial Intermediation Variables

	Loadings F1	Communality	Uniqueness
Broad money (% of GDP)	0.83	0.70	0.30
Domestic credit provided by banking sector (% of GDP)	0.82	0.66	0.34
Domestic credit to private sector (% of GDP)	1.03	1.05	-0.05
Market capitalization of listed companies (% of GDP)	0.85	0.72	0.28
	Model	**Independence**	**Saturated**
Discrepancy	0.1240	4.8044	0
Parameters	8	4	10
Degrees-of-freedom	2	6	—

Source: Own preparation.

Table 3 reports the result. The loads from the single factor corresponding to individual financial intermediation indicators as this are reported in *Table 2*, can be use to aggregate these indicators and to obtain a financial intermediations indicator. This financial intermediation indicator is use to rank the countries from the data set accordingly to the degree of financial intermediation. A higher value of the indicator will reflect a higher relative importance of the financial intermediation in the allocation of resources.

Table 3
Countries' Ranks Based on Financial Intermediation Indicator

Country	Financial intermediation indicator	Rank
Singapore	4.08	1
Panama	2.59	2
Estonia	2.37	3
Latvia	2.29	4
South Africa	2.03	5
Chile	1.96	6
China	1.47	7
Bulgaria	1.29	8
Russian Federation	1.09	9
Macedonia, FYR	0.85	10
Croatia	0.73	11
Peru	0.67	12
Ukraine	0.62	13
Hungary	0.60	14
Romania	0.51	15
Costa Rica	0.50	16
Jordan	0.35	17
Armenia	0.33	18
Czech Republic	0.33	19
Mauritius	0.15	20
Georgia	0.11	21
Nepal	-0.09	22
Sri Lanka	-0.17	23
Bangladesh	-0.59	24
Philippines	-0.75	25
Indonesia	-0.82	26
Argentina	-1.35	27
Brazil	-2.00	28

Source: Own preparation.

The countries ranking shows us that the degree of financial intermediation is either a result of a parallel evolution of capital market and banking system (as in Singapore's case) or, in the emerging markets an outcome of banking sector prevalence.

As a further step we test using three different methodological frameworks the statistic relevance for GNI per capita. In order to check the robustness of the result, we include in the model several control variables: Contribution of industry to GDP (as a proxy for the structure of the economy), Rural population (as a proxy for the structure of labour recourses), Total tax rate (% of commercial profits) (as a variable designated to reflect the fiscal policies) and a variable describing the democratic status of the society (the Polity IV project index of democracy).

4. Results and Comments

Our preliminary evaluation reported in *Table 4* shows that the financial intermediation indicator is statistical significant at 1% (5%) and positively correlated with the economic growth (GNI per capita in our case). These results are robust to the inclusion of the control variables and to the changes in estimation methodology.

Table 4
Per capita Incomes and Financial Intermediation

	OLS	GLM	Quantile Regression
Financial intermediation indicator	1.47*** (0.52)	1.47** (0.66)	2.34*** (0.47)
Contribution of industry to GDP	0.42*** (0.06)	0.42*** (0.07)	0.42*** (0.07)
Rural population	0.10*** (0.03)	0.10** (0.03)	0.15*** (0.02)
Total tax rate (% of commercial profits)	0.12*** (0.04)	0.12*** (0.03)	0.13*** (0.03)
Polity IV	0.32*** (0.14)	0.32* (0.19)	0.008 (0.23)
(Log) likelihood	-71.04	-71.29	
Durbin-Watson statistic	1.84		
Akaike info criterion	5.43	5.45	
Pearson statistic		13.39	

	OLS	GLM	Quantile Regression
Sparsity			8.37
Observations	28	28	28

*Note: ***, **, and * represent statistical significance at 1%, 5%, and 10% level. The table shows regressions for the cross-section of countries. The specification does not include a constant. Robust standard errors are shown in parenthesis. All variables are defined in appendix. For the Generalized Linear Model estimations: a) Family: Normal; b) Link function: Identity; c) Optimization algorithm: Quadratic Hill Climbing; For Quantile Regression estimation: a) Coefficient covariance: Bootstrap (10000 replications); b) Sparsity estimation: Siddiqui (mean fitted) - bandwidth method: Hall-Sheather (size parameter: 0.05); c) Random generator: Knuth; d) Bootstrap method: Markov Chain Marginal (as modified by Kocherginsky, He, and Mu, 2005).*

Source: Own preparation.

From the control variables, the largest impact on the economic development appears to be the one exercised by the structure of the economy as well as by the social stability and democratic stance. The lowest impact corresponds to labour resources and fiscal policies.

The OLS and GLM estimations produce comparable results in term of the estimation coefficients. However, while in OLS the variable Policy IV appears to be positively and statistical significant at 1% associated with incomes, for the GLM this variable lose the signification at 10%. All the other variables are positively and statistical significant at 1% (5%) linked to the incomes. The QL method provides higher coefficients suggesting a possible scale effect. Hence, GLM correct in a certain measures the biases in coefficients while QL reflect the existence of some extreme values in our data set.

5. Conclusions

By using data for 28 countries, we construct a global indicator of financial intermediation as part of financial development and we test the explanatory capacity of such an indicator. Despite the heterogeneity of data used, the result clearly suggests a strong relation between financial intermediation and incomes per capita as a proxy for economic growth. Of course, the robustness of our analysis depends on the relevance of the considered financial intermediation indicators. The list of such indicators is far from being completely and consistently on a conceptual level and empirically tested in a perfect robust manner.

Thus, future research directions should minimally: 1) integrating a larger set of explanatory variables 2) providing more conceptual explanations for the signaling effect of financial intermediation degree indicators and their impact on economic growth 3) investigate if the effect of financial development on growth depends in a non linear way on the level of income of countries.

However even in this stage there can be highlighted some important policies implications of our findings. Firstly, the financial stability is a critical component of economic development. Thus, financial stability oriented policies should be incorporated in any sets of policies, aiming to promote economic growth. Secondly, the stability of the banking sector is a critical pre-condition of the overall financial stability. Consequently, there is a need for strengthening the prudential and supervisory norms and rules. Thirdly, the fiscal policy should be harmonized with the monetary policy in an integrated set of public policies for sustaining the growth processes.

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