FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: THEORETICAL PERSPECTIVES

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Abstract - This study contributes to understanding the role of financial development on economic growth theoretically and empirically. In the theoretical part of the paper, by developing a Solow–Swan growth model augmented with financial markets in the tradition of Wu, Hou, and Cheng (2010), we show that debt from credit markets and equity from stock markets are two long run determinants of GDP per capita. In the empirical part, the long-run relationship is estimated for a panel of 40 countries over the period 1989–2011 by means of Augmented Mean Group (AMG) and Common-Correlated Effects (CCE), both of which allow cross-sectional dependencies. While the cross-sectional findings vary across countries, the panel data analyses reveal that both channels have positive long-run effects on steady-state level of GDP per capita, and the contribution of the credit markets is substantially greater. As a policy implication, we recommend that policy makers place special emphasis on implementing policies that result in the deepening of financial markets, including institutional and legal measures to strengthen creditor and investor rights and contract enforcement. Thus, by fostering the development of a country's financial sector, economic growth will be accelerated.

Keywords - conomic growth; Financial development; Common Correlated Effects; Augmented Mean Group; Panel data models.

I. INTRODUCTION

Financial markets are a key factor in producing strong economic growth because they contribute to economic efficiency by diverting financial funds from unproductive to productive uses. The origins of this role of financial markets may be traced back to the seminal work of Schumpeter (1911). In his study, Schumpeter points out that the banking system is the crucial factor for economic growth due to its role in the allocation of savings, the encouragement of innovation, and the funding of productive investments. Early works, such as Goldsmith (1969), McKinnon (1973), and Shaw (1973) put forward considerable evidence that financial development has a positive effect on economic growth. The role of financial development on economic growth has received considerable attention since the emergence of the endogenous growth theory. Theoretical contributions can be divided into five main strands: Firstly, most models have focused on the allocative role of the financial systems, e.g., Bencivenga and Smith (1991), Greenwood and Jovanovic (1990), Pagano (1993), and Wu, Hou, and Cheng (2010). Secondly, financial markets allow firms to diversify portfolios, to increase liquidity, and hence reduce risks, and thus stimulate growth (Levine, 1991 and Saint Paul, 1992). Thirdly, financial development provides an exit mechanism for agents and improves the efficiency of financial intermediation (Arestis, Demetriades, & Luintel, 2001; Rousseau and Wachtel, 2000). Fourthly, these markets also foster specialization in entrepreneurship and the adoption of new technologies (Greenwood and Smith, 1997). A final theoretical consideration is financial markets' ability to impact economic growth through changes in incentives for corporate control (Demirguc-Kunt and Levine, 1996; Jensen and Murphy, 1990).

The role of financial development on economic growth has also received considerable attention at empirical level. Most empirical models generally indicate that well-developed financial markets enhance the efficiency of resource allocation and faster long-run growth via several channels. Goldsmith (1969) was the first to document a positive correlation between financial development and growth in his 35-country sample. The majority of subsequent studies used essentially one of two separate measures to measure financial development and its role on economic growth: either credit markets or stock markets. There are other studies underlining the negative or insignificant impact of financial markets on economic growth, mainly in developing countries. e.g., Kar, Nazlıoglu,˘ and Agır,˘ 2011, Naceur and Ghazouani (2007), Narayan and Narayan (2013), Nili and Rastad (2007), and Snigh (1997). For example, Nili and Rastad (2007) indicate that the higher level of investment of the oil exporting countries can be explained rather by oil revenues, and that financial development in fact has a dampening effect on investment. Similarly, Narayan and Narayan (2013) find no evidence that neither the financial sector nor the banking sector contributes to growth for the Middle Eastern countries. The evidence on heterogeneity in the finance-growth nexus led to the grouping of countries by income level in the analysis of some researchers e.g., Andini and Andini (2014), Henderson, Papageorgiou, and Parmeter, 2013, Odedokun (1996), and Rioja and Valev (2014). Our review underlines several weaknesses of the current literature and hence the contributions of the current study. First, in most of these studies, either the theoretical foundations are insufficient or the connection between theory and empirical application are inadequately defined. In this paper, we first develop a Solow–Swan growth model augmented

with financial markets in the tradition of Wu et al. (2010).In particular, we assume a saving function in which debt from credit markets and equity from stock markets have a unitary elasticity of substitution between them. These two inputs are used by the representative firm to fund its investment activities. Hence, the contribution of this paper is its depth of focus on the theoretical backgrounds of the interaction between the financial sector and economic growth by utilizing the Trade-off. The organization of the paper is as follows: Section 2 develops a financial sector-augmented growth equation by using a Solovian growth framework. Section 3 is reserved for the empirical methodology and findings. Section 4 concludes the paper.

II. THEMODEL

We provide an augmented Solow (1956)–Swan (1956) growth model to determine the contribution of stock market and credit market developments to long-run economic growth. In addition to Solow–Swan growth model assumptions, we make an assumption on the form of saving function. With regard to the related theory of capital structure, i.e., Trade-off theory, investment is financed externally with debt from credit markets and equity from stock markets. Accordingly, we assume that aggregate saving is formed by the credit and stock markets in a closed economy Solow model. Following the Trade-off Theory, we assume that the following Cobb–Douglas type saving function, a combination of debt and equity, finances investment:

$$S = CMt\theta \cdot SMt1 - \theta 0 < \theta < 1(1)$$

where $CM_t$and SM_t represent the sources of funds obtained from credit markets (financial intermediations) and stock markets, respectively. Suppose that production function at time tis defined as:

$$Yt = Kt \cdot (At \cdot Lt)1 - \alpha 0 < \alpha < 1\ (2)$$

where$Y_t$is output, K_t is physical capital, L_t is labor force, and A_t is the overall technological progress, and parameter α represents production elasticity of capital. We assume that $A_t+1/A_t = 1 +x$ and $L_t+1/L_t = 1 +n$, where x is the exogenous rate of technological progress and n is the population growth rate. In a Solow framework, the fundamental equation of growth is defined as:

$$Kt + 1 - Kt = St - \delta \cdot Kt \qquad (3)$$

Table 1: Descriptive statistics.

Statistics/variables	Ln[y]	Ln[scm]	Ln[ssm]	Ln[n(1 + x) + δ + x]
Mean	4.001	1.808	1.172	0.782
Std. Dev.	4.210	1.877	1.327	0.776
Minimum	2.590	0.845	-1.353	0.526
Maximum	4.831	2.357	2.861	1.233
#of countries	40	40	40	40
#of observations	920	920	920	920

where $K_{t+1} - K_t$ is net investment between t + 1 and t, S_t is gross saving, and δ is depreciation rate, which is assumed to be constant.

IV. DATA, METHODOLOGY AND FINDINGS

In this section, we investigate the impact of financial development on economic growth using a panel of yearly data covering the period 1989–2011 on 40 selected countries with both credit and stock markets. Data is compiled from "World Development Indicators (WDI)", Global Stock Markets Factbook, and Supplemental Standard & Poor's database indicators. We used BankCredit (scm) to control for credit market development, computed as the ratio of domestic credit to private sector to gross domestic product (GDP), which takes into account credit issued to the private sector, but not to governments. Our measure of stock market development is Value Traded (ssm), which is computed as the ratio of the total value of all traded domestic shares in a stock market exchange to GDP. Data for real GDP per capita and population growth rate are obtained from OECD National Accounts database.

As traditional estimations become inefficient and invalid in the presence of cross-sectional dependency, new techniques that take into account this problem have been developed for stability and cointegration tests, and for also estimation methods, in recent years. Since testing for crosssectional dependence in a panel study is a crucial factor for selecting the appropriate estimator, the empirical work starts with cross-sectional dependency (CD) tests of Pesaran (2004) and Pesaran, Ullah, and Yamagata, 2008, to investigate the contemporaneous correlation across countries in the panel. We take into account the Bias-adjusted CD test for the interpretation of the results, which is consistent even when the CD test is inconsistent, since the finite sample behavior of the tests successfully control the size according to Pesaran et al. (2008). As can be seen from Table 2, for the models with intercept and trend, Bias-adjusted CD test statistics reject the null hypothesis for all variables and models but Ln[n(1+x)+δ+x].

Table 2:Results of cross-sectional dependency tests.

Series	Model	With intercept	p. value	With intercept and trend	
		Test st.		Test st.	p. value
Panel A: Ln[y]	CDL_{M1}[a]	1760.162	0.000	1730.082	0.000
	CDL_{M2}[b]	24.816	0.000	24.055	0.000
	CD[c]	0.612	0.270	-0.700	0.242
	Bias-adjusted CD[d]	2.143	0.016	2.790	0.003
Ln[scm]	CDL_{M1}	1194.724	0.000	1149.686	0.000
	CDL_{M2}	10.500	0.000	9.360	0.000
	CD	−0.768	0.221	−0.314	0.060
	Bias-adjusted CD	92.710	0.000	8.928	0.000
Ln[ssm]	CDL_{M1}	1023.750	0.000	1084.055	0.000
	CDL_{M2}	6.171	0.000	7.698	0.000
	CD	−1.894	0.029	−1.557	0.060
	Bias-adjusted CD	3.826	0.000	3.896	0.000
Ln[n(1 + x) + δ + x]	CDL_{M1}	1135.241	0.000	1269.967	0.000
	CDL_{M2}	8.994	0.000	12.405	0.000
	CD	−0.772 0.220 0.603	0.220	0.603	0.073
	Bias-adjusted CD	−0.730 0.767	0.767	−1.102	0.865
Panel B: Model	CDL_{M1}	1696.568	0.000	1814.633	0.000
	CDL_{M2}	23.206	0.000	26.1959	0.000
	CD	18.517	0.000	11.518	0.000
	Bias-adjusted CD	37.302	0.000	20.533	0.000

Notes: Panel A reports the CD_{LM1} test developed by Breusch and Pagan (1980), CD_{LM2} and CD tests developed by Pesaran (2004) and Bias-adjusted CD test developed by Pesaran et al. (2008) for individual variables and Panel B reports these tests for the model.

[a]CD_{LM1} tests the null of zero correlations in the context with N fixed and T→∞.

[b]CD_{LM2} tests the null of zero correlations in the context with N and T large.

[c]CD tests the null of zero correlations in the context with N large and T small.

[d]Bias-adjusted CD tests the null of zero correlations in the case of panel models with strictly exogenous regressors and normal errors.

Individual country results

After identifying countries with respect to financial structure, country-level estimations of coefficients. For the banking sector development, the sign of the significant coefficients at the country level show that, based on CCE estimation, there is a positive relationship for all except for Israel, and based on AMG, all except for Jordan, Norway and United Kingdom. According to FSI, Israel, Jordan and Norway are financially underdeveloped bank-based economies, while United Kingdom is a financially developed market based economy. The banking sector coefficient of financially developed bank-based economies of Australia, Canada, Denmark, Germany, Malaysia, Portugal and Thailand are all positive and significant, but insignificant for Austria, Belgium and Saudi Arabia. In this group, Denmark, Portugal and Canada have the most developed banking sector, and Belgium and Saudi Arabia, the least developed. Consequently, for the banking sector development, none of the countries that are classified as financially developed bank-based economies have negative effect on economic growth.

For the stock market development in most cases, the parameters are significant at least at the 10% level. The significant coefficients are positive for all countries except for Botswana, based on AMG

estimation; and all positive except for Hungary and Tunisia based on CCE estimation. According to FSI, Botswana, Hungary and Tunisia are financially underdeveloped bank-based economies. A positive and significant coefficient stock market is found for the financially developed stock market-based economies of China, France, Finland, the Netherlands and UK, but is found insignificant for Hong-Kong, Japan, Singapore, Sweden, Switzerland and the USA. In this group, in parallel to their GDP growth, Finland, China, France and the UK showed the greatest improvement in the stock market between 1989–2011,so these findings are not surprising, while the results for the USA, Hong Kong and Switzerland may have been caused by high stock market volatility in these countries. After all, for the stock market development, none of the countries

CONCLUDING REMARKS AND POLICY IMPLICATIONS

This study examines the role of financial development on economic growth. We first develop a Solow–Swan growth model augmented with financial markets in the tradition of Wu et al. (2010). The theoretical part of the study develops a model convenient for empirical applications utilizing the Trade-off Theory. In the second stage, the empirical model is estimated for a panel of 40 countries over the period 1989–2011 by means of AMG and CCE estimation methods, which allows cross-sectional dependencies. Our empirical analysis to determine the contribution of credit market and stock market development on economic growth provide the following findings and policy implications:

- Both credit market development and stock market development have positive long-run effects on steady-state level of GDP per capita. Our findings imply that financial development plays a role in economic growth for the majority of sample countries studied, in line with Beck et al., 2000, Cooray (2010), Levine and Zervos (1998) and Wu et al. (2010).
- Although our results vary across countries, panel findings indicate that the contribution of credit market development is substantially greater. Thus, our findings support the view that credit market-based financial systems are more likely to promote long-term economic growth than stock market-based ones (e.g., Arestis et al. (2001)). In this respect, emphasis should be on implementing government policies which lead to the deepening of the credit market.
- However, for a minority of countries (e.g., China and UK), the positive influence of stock market development is more powerful. One explanation can be as follows. According to Table 6, China and United Kingdom are classified as financially developed stock-market based economies. When the stock market development data of countries in this group are compared, China has shown the second fastest level of development (after Finland) since the 2000s. Thus, policymakers should take measures to encourage stock market liquidity.
- With respect to FSI, financial development has a positive or insignificant effect on growth in all the financially developed bank-based and stock market-based economies. Hence, it can be stated that, for economic growth, it is essential to implement specific policies in their financial structure, although other sectors should not be neglected in this process.
- On the whole, increasing the openness, competitiveness and security of markets is likely to create more active and dynamic financial intermediaries. Therefore, governments should take some essential measures to foster the development of a country's financial sector and accelerate economic growth. Firstly, policymakers, especially in financially developed bank-based economies, should enhance macroeconomic stability to increase investor confidence. Measures for the probability of full and timely repayment of domestic and foreign debt should be taken. In the banking sector, while ensuring full access to credit, steps should be taken to reduce the risk of payment crisis and default originating from the presence of a large amount of dollarization. Moreover, there is need for institutional and legal improvements that strengthen creditor and investor rights and contract enforcement. In this context, for instance, anti-competitive effects of subsidies and tax reductions implemented by governments should be reduced. The second key measure, especially in financially developed stock market-based economies, is the strengthening of auditing and reporting standards regarding company financial performance. The legal interests of minority shareholders and their property rights should be given greater protection. Lastly, policymakers should focus on increasing financial access, for example, the complexity of the financial markets should be reduced. Further research in these directions would be significant contributions.

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