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Financial structure on growth and volatility[☆]

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ABSTRACT

By applying the pooled mean group estimator to a large panel up to 40 countries over the 1960–2009 period, this study finds that financial structure is significantly cointegrated to both economic growth and its volatility. In particular, the relationship is positive in nature, suggesting that more market-based countries enjoy faster economic growth but suffer more from economic fluctuations in the long run. Accordingly, in sharp contrast to the existing evidences, we conclude that the architecture of an economy's financial system matters for real sector performance. Moreover, the findings are robust to a variety of sensitivity checks, including the problem of endogeneity, the use of different financial structure (and growth volatility) indicators, the inclusion of extra growth (volatility) determinants, and the control of cross-sectional dependence in the panel data.

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1. Introduction

This study empirically re-assesses the long-debated issue that whether the financial architecture of a country exerts any discernible effect on economic growth, and also offers additional fresh evidence on the potential influences of financial structure on the volatility of growth rates. Arguably, the existing theories generally emphasize specific features of banks and markets and often provide contrasting, even conflicting, predictions concerning the possible impacts of financial structure, measured by the mix of financial markets and intermediaries operating in a country, on economic growth. On one hand, the advocates of bank-based financial systems assert that banking sectors are better at fostering economic performance through their relative skills in (i) producing information and improving capital allocation and corporate governance, (ii) ameliorating risk and enhancing investment efficiency, and (iii) mobilizing capital to take advantage of economies of scale, e.g., Levine (2002, p. 399). On the other hand, the proponents of market-oriented financial systems stress the growth-improving role of well-functioning stock markets by (i) promoting higher motive to research firms as it is much simpler to profit from this information in a large, liquid market, (ii) enhancing better corporate governance, and (iii) facilitating richer risk management, e.g., Levine (2002, p. 400).[1] Apparently, there is hardly any consensus at the theoretical front, and the relative merits of bank-oriented versus market-oriented financial systems remain an empirical issue.

To evaluate the precise relationship between financial structure and economic growth, earlier empirical works often concentrate on Japan and Germany as bank-based systems and the United Kingdom and the United States as market-based systems. However, as argued in Levine (2002), it is unlikely to reach general conclusions about the growth effects of bank-based and market-based financial architecture based on only four economies, particularly those four countries that share very comparable long-run growth patterns. In order to provide international evidence on the role of financial structure on growth, Levine (2002) constructs a large data set for 48 countries that encompasses wide-ranging national experiences. By averaging the time-series data for each country over the 1980–1995 period, i.e., one observation per country, Levine (2002) employs cross-sectional analysis to assess four competing theories of financial structure, namely, the bank-based view, the market-based view, the financial-services view, and the law

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[1] Moreover, other hybrid views suggest that banks and stock markets are important for growth under different conditions. Boyd and Smith (1998) argue that, while banks play an important role in promoting growth in the early stages of economic development, stock markets are more beneficial for growth as economic development advances. Similarly, Rajan and Zingales (1998a) declare that bank-based systems have a comparative advantage in countries with weak legal institutions but, as the contractual environments become stronger, the economies will benefit more from getting more market-oriented.

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and finance view. By minimizing the significance of the bank-based versus market-based debate, the financial-services view highlights that the key issue is the overall financial services themselves that are provided by the financial systems are by far the most relevant, whether they are provided by banks or markets is of second-order importance. Moreover, as a notable and special case of the financial-services view, the law and finance view emphasizes that a well-operating legal system facilitates the functions of both banks and markets and thereby stimulates economic growth.

The empirical results of Levine (2002) are demonstrative in that, while the cross sectional data strongly support both the financial-services and the law and finance views, there is no evidence in favor of either the bank-based or the market-based perspective. Notably, the findings are robust to a variety of sensitivities checks that utilizes alternative indicators of financial structure, distinct data sets, and different econometric approaches. As such, the paper's primary conclusion is that classifying economies by their financial architecture is unlikely to be an effective way in explaining cross-country differences in long-run economic growth. In addition, Beck and Levine (2002) employ the Rajan and Zingales' (1998b) empirical specification to a large panel of 42 countries and 36 industries to investigate the association between financial structure and both industry growth and new establishments. Again, the results indicate that distinguishing whether a country is bank-based or market-based does not improve our understanding of the industrial growth patterns and the formation of new establishments. Furthermore, they find that the structure of the financial system does not help the efficiency of capital allocation across countries.[2] Another related paper by Demirgüç-Kunt and Maksimovic (2002) uses firm-level data to demonstrate that the difference in the organization of financial systems is not significantly related to the ability of firms' access to obtain external financing and is, therefore, not a robust predictor for economic growth.

In sharp contrast, there are also studies documenting that financial structure exerts a statistically significant and economically important effect on economic growth. For instance, Tadesse (2002) examines the relative performance of bank-oriented versus market-oriented systems differs among countries with alternative level of financial development and with diverging size distribution of firms. The results from using industry-level data of a panel of 36 countries reveal that banks outperform (underperform) markets among less (more) financially developed economies, and countries dominated by smaller (larger) firms grow faster in bank (market)-based financial systems. Thus, financial structure matters for real sector performance. In addition, Pinno and Serletis (2007) apply a standard Bayesian classification (mixture) approach to the data set of Levine (2002), and find evidence in support that economic growth benefits more from bank-based (market-based) financial systems in developing (developed) countries. Similarly, Luintel et al. (2008) and Arestis et al. (2010) uncover significant heterogeneity in cross-country parameters and adjustment dynamics and suggest the use of (mainly) time series approaches in analyzing the role of financial structure in economic performance. Their outcome indicates that the structure of financial systems significantly explains real per capita *output* level for the majority of sample countries under investigation.

In fact, the findings of Luintel et al. (2008) and Arestis et al. (2010) are not inconsistent with that of Levine (2002), since they are actually analyzing the effect of financial structure on the level of economic development (proxied by the logarithm of real GDP per capita) while Levine (2002) is assessing the impact of financial structure on economic growth (proxied by the first difference of the logarithm of real GDP per capita). While financial structure is associated with higher level of real per capita GDP, it does not necessarily imply that growth is faster as well. As a complement to the existing empirical evidences, this study first relies upon a panel data of 40 countries over the 1960–2009 period and a (pooled) mean group estimator to explore the long-run linkage among *growth*, financial structure, and other conditioning variables. On balance, the results indicate that there is an equilibrium relation between economic growth and financial architecture, along with other growth determinants. In particular, the financial structure–growth nexus is statistically significant and positive in nature, suggesting that economic growth is faster in more market-based countries. Furthermore, we proceed to assess whether financial structure plays any important role in determining the extent of growth volatility.[3] Overall, the panel results show that, after controlling for growth volatility determinants, there exists a significantly positive link between growth volatility and financial structure. In sum, we provide strong evidence in supporting to notion that financial structure not only matters for growth but also for growth volatility as well.

The paper is organized as follows. Section 2 discusses the empirical strategy. Section 3 describes the data sources. Section 4 analyzes the empirical results. Section 5 concludes the paper.

2. Empirical model

In a recent influential paper, Levine (2002) constructs a broad cross-country dataset for 48 countries to examine the comparable growth effect of market- and bank-based financial systems. In particular, most of the analyses involve pure cross-sectional analyses with one observation (averaged over the 1980–1995 period) per country. In contrast, we rely upon a large panel data set to explore not only the long-run effect of financial structure on economic growth, but also the possible long-term influence of financial structure on the volatility of growth rates. To do so, we will employ the pooled mean group (PMG) estimator, proposed by Pesaran et al. (1999), to obtain consistent estimates of financial structure (along with other growth or volatility determinants) variables. In a panel data structure, suppose that the long-run equilibrium association between the dependent variable y and the explanatory variable x (among which, a measure of financial structure) can be characterized as,

$$y_{it} = \theta_{0i} + \theta'_{i} x_{it} + \epsilon_{it} \tag{1}$$

where y_{it} is either the growth rate of real per capita gross domestic product or its corresponding volatility measure for country i in year t, and the vector x_{it} contains mainly an indicator of financial structure, along with other covariates. The coefficient of major interest is θ_i, which measures the long-run effect of x_{it} on y_{it}.

As suggested in Pesaran et al. (1999), Eq. (1) can be embedded into an autoregressive distributed lag (ARDL) model to allow for rich dynamics in the manner that the dependent variable y_{it} adapts to changes in the explanatory variables x_{it}, if any. The ARDL $(p,q,\cdots,q)$ model, i.e., the dependent and independent variables enter the right-hand side with lags of order $p, q, \cdots, q$, respectively, can be written as,

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \delta'_{ij} x_{i,t-j} + \mu_i + \epsilon_{it} \tag{2}$$

where μ_i represents the country-specific effects.

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[2] In the same line, Ndikumana (2005) also concludes that financial structure per se exert no independent effect on domestic investment in that it does not increase the response of investment to changes in output (per capita GDP), after controlling for the level of financial development and other determinants of investment.

[3] The recent literature points out that understanding growth volatility is important because growth stability, by itself, is an important policy objective (Mishkin, 2009), countries with higher growth volatility tend to have lower economic growth (Ramey and Ramey, 1995), larger growth volatility is associated with worsened income distribution (Breen and García-Peñalosa, 2005), and higher macroeconomic volatility shifts the Phillips curve outwards and generates more output and employment costs (Benigno and Ricci, 2011).

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