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Institutional quality thresholds and the finance – Growth nexus

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ABSTRACT

Using an innovative threshold estimation technique, this study examines whether the growth effect of financial development in countries with distinct levels of institutional development differs. The results demonstrate that there is a threshold effect in the finance-growth relationship. Specifically, we found that the impact of finance on growth is positive and significant only after a certain threshold level of institutional development has been attained. Until then, the effect of finance on growth is nonexistent. This finding suggests that the financial development-growth nexus is contingent on the level of institutional quality, thus supporting the idea that better finance (i.e., financial markets embedded within a sound institutional framework) is potent in delivering long-run economic development.

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1. Introduction

A large amount of literature has examined the relationship between financial development and economic growth using cross-country, time series, panel data, and firm-level studies (King and Levine, 1993a, 1993b; Demetriades and Hussein, 1996; Levine, 1997, 2003; Rajan and Zingales, 1998; Levine et al., 2000; Al-Yousif, 2002; Beck and Levine, 2004; Bertocco, 2008; Hasan et al., 2009; Jalil et al., 2010; Rahaman, 2011; Kendall, 2012).[1] By and large, the empirical evidence has suggested that there is a positive long-run association between indicators of financial development and economic growth. According to Levine (1997), financial intermediaries enhance economic efficiency, and ultimately economic growth, by helping allocate capital to its best uses. Moreover, the existing evidence also demonstrates that this relationship is very likely to be nonlinear where the effect of finance on growth may vary by stage and level of economic development. For example, Deidda and Fattouh (2002) and Rioja and Valev (2004a) found that there is no significant relationship between financial development and growth in low-income countries, whereas the relationship is positive

and significant in high-income countries.[2] In addition, Rioja and Valev (2004b) pointed out that financial development exerts a strong positive effect on economic growth only when it has achieved a certain level or threshold; below this threshold, the effect is at best uncertain. Shen and Lee (2006), Ergungor (2008), Hung (2009) and Cecchetti and Kharroubi (2012) also discovered patterns of nonlinearity in the relationship between financial development and growth.[3] In general, all these papers suggested that a well-developed financial market is both growth-enhancing and consistent with the proposition of "more finance, more growth."[4]

However, recent researchers have suggested that "better finance, more growth" is a more accurate proposition than "more finance, more growth." These researchers have argued that a financial system embedded in a sound institutional framework is more important for growth. Arguably, an increase in financial development, as captured by standard financial development indicators, may not result in increased growth due to corruption in the banking system or political interference that may divert credit to

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[1] Levine (2003) provided an excellent overview of a large body of empirical literature that suggests that financial development can robustly explain differences in economic growth across countries. Ang (2008) pointed out that although the positive role of finance on growth has become a stylized fact, there are some methodological reservations about the results of these empirical studies.

[2] However, Huang and Lin (2009) pointed out that the positive effect between financial development and growth is larger in low-income countries than in high-income countries.

[3] Ang (2008) emphasized that an appropriate specification of the functional form is critical in understanding the finance-growth relationship since several studies have demonstrated that the finance-growth nexus may be nonlinear, and more research in this area is necessary.

[4] One of the main conclusions that Levine (2003) drew from empirical work is that the size of the banking system and the liquidity of stock markets are each positively linked to economic growth.

unproductive or even wasteful activities. Demetriades and Andrianova (2004) and Arestis and Demetriades (1996) highlighted that varying relationships may reflect differences in the quality of finance, which is determined by the quality of financial regulation and rule of law. Likewise, Al-Yousif (2002) suggested that the relationship between financial development and economic growth cannot be generalized across countries because economic policies are country specific and their success depends on the efficiency of the institutions implementing them.

Although "better finance, more growth" is a plausible conjecture, there exists limited direct evidence to confirm that institutions make a difference in the way financial development affects economic growth. An exception is the study by Demetriades and Law (2006), who, using a linear interaction model, found that financial development has larger effects on economic growth when the financial system is embedded within a sound institutional framework. They also found that financial development is most potent in middle-income economies, where its effects are particularly large when institutional quality is high. In low-income economies, more finance without sound institutions may not succeed in delivering long-run economic development. The relevance of institutional quality is clearly supported by this finding; the researchers concluded that "better finance, more growth" has much wider application than "more finance, more growth." However, this type of modeling strategy has one limitation. The interaction term (constructed as a product of financial development and institutions) used to capture the contingency impact of finance on growth imposes a priori restriction that the effect of financial development on economic growth monotonically increases (or decreases) with the level of institutional development. It may be that a certain level of institutional quality has to be attained before financial development can have any impact on growth. This conjecture requires a more a flexible modeling strategy that can accommodate different kinds of financial development-growth-institutions interactions.

This paper provides new evidence that sheds light on the role that institutions play in mediating the influence of financial development on growth. Specifically, we explore whether there exists an institutional quality threshold in the finance-growth relationship. This relationship may be contingent on institutional quality, where financial development promotes economic growth after institutions exceed a certain threshold level. The findings of the study may have important policy implications. If there is clear evidence that weak institutions significantly hamper the finance-growth nexus, then policy makers should propose measures that strengthen institutions economically to improve the functioning of financial markets and boost economic development. In addition, the paper highlights a potential effect of institutions on growth through indirect channels. For example, Law (2009) found that the institutional channel outperforms the competition channel in ensuring the positive effects of openness on financial development in developing countries. Mishkin (2009) also emphasized that globalization promotes financial development and economic growth in developing countries via institutional reforms.

This study extends the literature in four respects. First, we used a regression model based on the concept of threshold effects. The fitted model allowed the relationship between financial development and growth to be piecewise linear, with the institutions indicator acting as a regime-switching trigger. Second, we used a dataset sufficiently large to enable robust conclusions to be drawn; specifically, the sample used in this study consisted of annual data from 85 countries from 1980 through 2008. Third, two datasets were employed in the analysis, corresponding to institutions datasets from the International Country Risk Guide (ICRG) and the World Bank Worldwide Governance Indicators (WGIs). Finally, three financial development indicators were employed in the analysis-private sector credit, liquid liabilities, and commercial bank assets-to capture various aspects of banking sector development.

This paper is organized as follows: Section 2 lays out the empirical model, the threshold regressions of Hansen (2000) and Caner and Hansen (2004), and the data; Section 3 contains a discussion of the empirical findings; and Section 4 provides a summary and conclusions.

2. Empirical model and the data

2.1. Empirical model

The empirical model is based on King and Levine (1993a, 1993b) and Levine and Zervos (1998). Since publication of their works, it has become common practice to examine the empirical linkages between finance and growth using the following linear cross-country growth equation:

$$GROWTH_i = \beta' FD_i + \gamma X_i + \varepsilon_i \quad (1)$$

where $GROWTH_i$ is the average growth rate in country i, FD_i is the country's level of financial development, X is a vector of controls (initial income per capita, investment-gross domestic product (GDP) ratio, population growth rates, and human capital), and ε_i is a noise term. All the variables are transformed into logarithm.

To test the hypothesis outlined in the previous section, we argue that the following Eq. (2) is particularly well suited to capture the presence of contingency effects and to offer a rich way of modeling the influence of institutional development on the impact of financial development in economic growth. Consequently, we use the threshold regression approach suggested by Hansen (2000) to explore the nonlinear behavior of finance in relation to the economic growth. The model, based on threshold regression, takes the following form:

$$GROWTH_i = (\beta_1 FD_i + \gamma_1 X_i)I(INS \leqslant \lambda) + (\beta_2 FD_i + \gamma_2 X_i)I(INS \geqslant \lambda) + \varepsilon_i \quad (2)$$

where INS (i.e., level of institutional development) is the threshold variable used to split the sample into regimes or groups and λ is the unknown threshold parameter. $I(\cdot)$ is the indicator function, which takes the value 1 if the argument in the indicator function is valid, and 0 otherwise. This type of modeling strategy allows the role of finance to differ depending on whether institutions are below or above some unknown level of λ. In this equation, institutions act as sample-splitting (or threshold) variables. The impact of financial development on growth will be β_1 and β_2 for countries with a low or high regime, respectively. It is obvious that under the hypothesis $\beta_1 = \beta_2$ and $\gamma_1 = \gamma_2$ the model becomes linear and reduces to (1). Models such as (2) have been used in the analysis of trade and growth (Khoury and Savvides, 2006), knowledge spillovers (Falvey et al., 2007), foreign direct investment (FDI) and growth (Azman-Saini et al., 2010), and FDI and income inequality (Wu and Hsu, 2012), among other topics.

The first step of our estimation was to test the null hypothesis of linearity H_0: $\beta_1 = \beta_2$ against the threshold model in Eq. (2). Since the threshold parameter λ was not identified under the null, this became a non-standard inference problem and the Wald or LM test statistics therefore did not carry their conventional chi-square limits (see Hansen, 1996, 2000). Instead, inferences were implemented by calculating a Wald or LM statistic for each possible value of λ and subsequently basing inferences on the supremum of the Wald or LM across all possible λs. The limiting distribution of this supremum statistic is non-standard and depends on numerous model-specific nuisance parameters. Since tabulations were not possible, inferences were conducted via a model based on bootstrap whose validity and properties were established by Hansen (1996). Once an estimate of λ was obtained (as the minimizer of the residual