

# Is the Relationship Between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries

NAHLA SAMARGANDI<sup>a,b</sup>, JAN FIDRMUC<sup>a,c,d</sup> and SUGATA GHOSH<sup>a,\*</sup>

<sup>a</sup> Brunel University, UK

<sup>b</sup> King Abdulaziz University, Saudi Arabia

<sup>c</sup> IES, Charles University, Czech Republic

<sup>d</sup> CESifo Munich, Germany

**Summary.** — We revisit the relationship between financial development and economic growth in a panel of 52 middle-income countries over the 1980–2008 period. Using pooled mean group estimations in a dynamic heterogeneous panel setting, we show that there is an inverted U-shaped relationship between finance and growth in the long run. In the short run, the relationship is insignificant. This suggests that too much finance can exert a negative influence on growth in middle-income countries. The finding of a non-monotonic effect of financial development on growth is confirmed by estimating a threshold model.

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*Key words* — financial development, economic growth, pooled mean group estimation, dynamic panel threshold, non-monotonicity

## 1. INTRODUCTION

The relationship between financial development and economic growth is important and intriguing at the same time. The earliest known proponents of the notion that finance could be an engine of growth are Schumpeter and Opie (1934); their view was later endorsed by Gurley and Shaw (1955), McKinnon (1973) and Shaw (1973), among others. There is, however, another strand of the literature, arguing that economic growth drives the demand for financial services rather than the other way round (Robinson, 1952). Finally, Lucas (1988) and others discount altogether the possibility that the financial sector has any impact on growth. The importance of financial development has received renewed attention as the endogenous growth literature evolved from the 1980s onwards (see Bencivenga & Smith, 1991; Greenwood & Jovanovic, 1990; King & Levine, 1993a; etc.). The strength of the finance–growth relationship is ultimately an empirical matter (King & Levine, 1993b; Levine, 2005), and much of the subsequent literature has focused on the multi-faceted empirical aspects of this relationship.

With this backdrop, we attempt in this paper to contribute to the finance and growth literature by studying this relationship for a group of middle-income countries, using advanced econometric techniques. In doing so, we explore the nature of the relationship between financial development and economic growth, and especially consider whether it may in fact be non-monotonic. Indeed, much of the current literature suggests that the impact of financial deepening on growth becomes negative once a certain threshold is reached (Arcand, Berkes, & Panizza, 2012; Cecchetti & Kharroubi, 2012), or that this impact seems to have evaporated in recent data (Rousseau & Wachtel, 2011).

In the light of the on-going debate on the impact of financial development on economic growth, we seek to contribute to the literature – from an empirical perspective – in the following ways. First, we adopt the recently developed dynamic panel

heterogeneity analysis introduced by Pesaran, Shin, and Smith (1999) and applied to the financial development and growth nexus by Loayza and Rancière (2006). Specifically, we use the autoregressive distributed lag (ARDL) model, in order to examine both the long- and short-term effects of financial intermediation on growth. The use of this model allows us to take into account country-specific heterogeneity. Second, we consider 52 middle-income countries.<sup>1</sup> Although there is a large body of literature that investigates the linkage between financial development and economic growth in advanced countries, far less is known about this relationship in developing countries. The focus on advanced countries is particularly due to the nature of their financial markets. Financial systems in advanced countries can efficiently facilitate the mobilization of capital between surplus and deficit agents, which eventually leads to economic growth. Developing countries, on the other hand, were traditionally characterized by less developed and less efficient financial systems with lower levels of banking intermediation, despite a notable

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improvement from the 1980s onwards. Consequently, previous studies argue that the relationship between financial development and economic growth in developing countries is inconclusive (Kar, Nazlioglu, & Agir, 2011). Third, given that financial development can be captured by several possible indicators, we use the principal component analysis (PCA) to construct an indicator of financial development that is as broad as possible and captures various dimensions of the financial sector. Finally, we allow for the existence of a non-linear relationship between financial development and economic growth in order to investigate the possibility of the economy being adversely affected due to “too much” finance. Specifically, we apply two approaches: a quadratic relationship between financial development and growth, and a threshold model. In the former, we test the robustness of our results by following the recent study by Lind and Mehlum (2010), which proposes tests for the existence of U- or inverted U-shaped relationships. By applying this test, both necessary and sufficient conditions for the existence of an inverted U-shaped pattern can be verified. As regards the second approach, we follow Bick (2010) and Kremer, Bick, and Nautz (2013) and estimate a dynamic panel threshold model that accounts for sharp discrete shifts to investigate the potential existence of a threshold level in the linkage between financial development and economic growth. To our knowledge, this is the first study that combines these two different approaches to investigate the non-linearity within the finance and growth nexus.

Our findings suggest that the relationship between financial development and economic growth need not be linear, either in the long or short run. Rather, financial deepening appears to have a negative effect on growth beyond a certain threshold, which is different from the predominant view that financial development and economic growth are positively linked.

The remainder of this paper is organized as follows: Section 2 conducts an extensive survey of the literature on finance and growth to put our study in context. Section 3 discusses the data and describes the construction of the financial development indicator. Section 4 explains the econometric methodology used to analyze the impact of financial development on economic growth. The empirical results of the paper are discussed in Section 5. Finally, Section 6 concludes the paper.

## 2. LITERATURE REVIEW

The extensive literature on the relationship between finance and growth can be traced back to the early twentieth century. Among the initial influential contributions in this area is the work of Schumpeter and Opie (1934), who highlighted the role of financial institutions in funding productive investments and encouraging innovation, both of which foster growth. Patrick (1966) develops the ideas of ‘supply-leading’ and ‘demand-following’ aspects of financial development. The supply-leading role of financial institutions is to act as productive inputs in the production process and to transfer resources from traditional to modern sectors. This is echoed by Gurley and Shaw (1955) and Goldsmith (1969), who argue that more developed financial markets promote economic growth by mobilizing savings to finance the most productive investments. In a more recent study, Xu (2000) finds strong evidence that financial development, primarily via the investment channel, affects growth positively.

The demand-following role is about growth being spurred by the real side of the economy, which generates the demand for financial services so that financial institutions and instruments follow the lead taken by the real sector.<sup>2</sup> More rigorous

theoretical underpinnings to the finance–growth relationship were provided by McKinnon (1973) and Shaw (1973), who observed that pervasive financial regulations involving interest rate ceilings and reserve requirements, especially in developing countries, impede saving–investment decisions and stressed the importance of financial liberalization via a deregulation of interest rates which would lead to an increase in loanable funds as well as to a more efficient allocation of funds.<sup>3</sup>

The emergence of endogenous growth theory (Lucas, 1988; Romer, 1986) generated renewed interest in the role of financial development in driving economic growth. This literature highlights the positive role played by the financial sector in bolstering growth, in particular by mobilizing savings, allocating resources to the most productive investments, reducing information, transaction and monitoring costs, diversifying risks, and facilitating the exchange of goods and services. This results in a more efficient allocation of resources, more rapid accumulation of physical and human capital, and faster technological progress. For instance, the theoretical work of Greenwood and Jovanovic (1990) shows that financial intermediaries promote investment and growth by enabling a higher rate of return on capital, while the growth itself spurs the expansion of financial institutions, implying a two-way relationship between financial intermediation and economic growth. Likewise, in Bencivenga and Smith (1991), financial intermediaries allow agents to channel savings into investments with high return which boosts growth, but the intermediaries also allow individuals to hold diversified portfolios to mitigate risks associated with their liquidity needs. Roubini and Sala-i-Martin (1992) show that in a situation where it is difficult to raise revenue via income taxation, governments may resort to financial repression to raise the inflation-tax base, and the resulting higher inflation dampens productivity and growth.<sup>4</sup>

Some recent studies on the finance–growth nexus posit that the relation between finance and growth is non-monotonic. Cecchetti and Kharroubi (2012) find that as bank credit to private sector exceeds 90% of GDP, finance becomes a drag on growth. Strikingly, a faster rate of growth of the financial sector may be detrimental to the growth of the economy because the financial sector competes for resources with the rest of the economy.<sup>5</sup> Such a non-monotonic effect is observed also by Arcand *et al.* (2012), who utilize different datasets at the country and industry levels and find that the negative finance–growth relationship occurs once the ratio of private credit to GDP exceeds a threshold of about 110% for high-income countries. This result is consistent across different types of estimators, including simple cross-section OLS regression, semi-parametric estimations and system-GMM.<sup>6</sup>

A more general finding, that the finance–growth relationship varies with the stage of development in a non-linear fashion, is put forward by Deidda and Fattouh (2002), who consider a cross-section of 119 (developed and developing) countries. They apply threshold regressions to high-income and low-income countries and find that finance is a significant (insignificant) determinant of growth for high- (low-) income countries. Likewise, Rioja and Valev (2004a, 2004b), working with panel data for the 1961–95 period for 74 (developed and developing) countries find that the effect is positive and significant in countries with high- and intermediate-income levels, but insignificant in low-income countries.<sup>7</sup> Huang and Lin (2009) consider a sample of 71 high- and low-income countries in a cross-section IV threshold analysis from 1960 to 1995. They find the link between finance and growth to be positive but non-linear; however, in contrast to Deidda and Fattouh (2002) and Rioja and Valev (2004a, 2004b), the effect

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