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Finance and growth: Time series evidence on causality☆

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ABSTRACT

This paper re-examines the empirical relationship between financial and economic development while (i) taking into account their dynamics and (ii) differentiating between stock market and banking sector development. We study the cointegration and causality between finance and growth for 22 advanced economies. Our time series analysis suggests that causality patterns depend on whether countries' financial development stems from the stock market or the banking sector. We show that stock market development tends to cause economic development, while a reverse causality is mostly present between banking sector development and output growth. These findings indicate that the direction of causality between finance and growth is likely to be different at high levels of development.

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1. Introduction

The importance of the relationship between financial development and economic growth is well recognized in the growth and financial literature alike. Economic theory predicts that well-functioning financial intermediaries and markets reduce information asymmetries, facilitate risk sharing and mobilize savings, which leads to a more efficient resource allocation and, thus, may foster long-term growth.[1] A large empirical literature provides evidence that financial development matters for growth. However, there is less consensus as to whether the effect is mainly due to banks, stock markets or both. The "finance-led growth" hypothesis, according to which financial development exerts a positive and causal effect on real output is mainly supported in cross-country studies that focus on *bank* development proxies (King and Levine, 1993; Levine et al., 2000; Calderon and Liu, 2003; Christopoulos and Tsionas, 2004; Rioja and Valev, 2004; Loayza and Ranciere, 2006). Evidence when *stock market* development is also considered is more scarce or leads to less consistent results (Harris, 1997; Arestis et al., 2001).

This study provides new evidence that strengthens the notion that finance and growth co-move in a more complex way than previously thought. For this purpose, we investigate the relationship

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[1] Theoretical models that capture the different channels through which financial intermediaries have a positive impact on real output, have been developed, among others, by Greenwood and Jovanovic (1990), Levine (1991), Bencivenga and Smith (1991), Greenwood and Smith (1997), Blackburn and Hung (1998). Together with a positive finance-growth nexus, the destabilizing effect of stock market crashes and financial crises is also recognized (Minsky, 1974; Kindleberger, 1978), however its impact on long-term growth is less clear (Cerra and Saxena, 2008; Ranciere et al., 2008).

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between economic and financial sector - banking and stock markets - development for 22 advanced economies during the period 1973–2011. Our empirical strategy is motivated by recent theoretical contributions that stress how banks and stock markets may relate differently to economic development. These studies argue that, because banks and stock markets affect economic outcomes through different channels, their effectiveness depends on a host of country-specific factors such as the legal and contractual environment (Deidda and Fattouh, 2008; Song and Thakor, 2010), stage of development (Boot and Thakor, 1997) or new technologies available (Allen and Gale, 1999). Thus, the role of finance in real sector outcomes may differ depending on whether financial development stems from securities markets or the banking sector. To capture these different causality patterns, we explore the link between finance and economic development for each country in our sample, over time, by employing a framework in which both financial and economic development are treated as endogenous variables.

Our results show that causality patterns indeed differ across countries and, in particular, with the type of financial institution considered. We find that, among advanced economies, stock market development generally causes economic development, while the causality between banking sector development and growth goes in the reverse direction, most of the time. These results suggest that the extensive empirical evidence that finance causes growth is sensitive to the type and dominance of a particular financial institution. Our findings are robust to different estimations techniques and proxies for financial development. We use time series unit root and cointegration tests, as well as recent panel cointegration techniques, and distinguish between several notions of causality including long- and short-run causality. We find that the strong causal link between stock market development and GDP is present both in the short- and the long-term, while the reverse causality from real economic growth to banking sector development generally has a delayed effect.

Our research contributes to the finance-growth literature in several ways. First, we show that, among countries with relatively high levels of development, a finance-led growth hypothesis is supported only when financial development stems from security markets. Thus, the strong causal link between banking sector development and growth appears to vanish when we consider a time period in which financial sectors have developed intensively. Second, our results suggest that finance and growth might relate differently in advanced economies. Empirical evidence generally shows that both stock markets and banks tend to become more developed as economies grow and that securities markets tend to develop more rapidly than banks (Demirguc-Kunt and Levine, 2004). However, there is less consensus whether this financial system evolution matters for growth (Beck and Levine, 2002; Levine, 2002). Our findings show that, at higher levels of development, stock market development tends to have a causal impact on growth, while banking sector does not. Thus, the evolution of financial systems towards a more market-based structure does have an impact on real sector outcomes. These findings complement recent research that argues that not just the size, but also the structure of financial systems may matter for growth (Fecht et al., 2008; Luintel et al., 2008; Ergungor, 2008; Arestis et al., 2010; Demirguc-Kunt et al., 2012).

The remainder of this paper is organized as follows. Section 2 reviews theoretical and empirical contributions on this topic. Section 3 presents the variables and data used. Section 4 discusses the cointegration and causality tests employed and presents our main results and robustness checks performed. Section 5 concludes.

2. Motivation and previous research

Economists hold different opinions of the role of finance on economic growth and the developed theoretical literature mirrors these divisions. The theoretical underpinnings of this role can be traced back to Schumpeter (1934), who saw financial intermediaries as playing a pivotal role in output growth by channeling savings to the most productive investments. The alternative view is held by Robinson (1952), who argued that financial development simply follows economic growth which is generated elsewhere. Patrick (1966) characterizes these two possible relationships as the “supply-leading” and “demand-following” hypotheses. Both of his hypotheses, as well as possible interactions between them, have been further developed by, among others, Greenwood and Jovanovic (1990), Levine (1991), Bencivenga and Smith (1991), Greenwood and Smith (1997), Blackburn and Hung (1998).

While both banks and stock markets perform important functions which affect real sector outcomes, their relative effectiveness might not be the same depending on the economic and contractual environment of a country. A recent theoretical literature analyses how banks and financial markets can affect economic outcomes through different channels and how this impact might depend on structural characteristics of the economy. For example, the well-functioning of stock markets depends on how important is the value of market information in real sector outcomes. Boot and Thakor (1997) argue that severe moral hazard attenuates the value of this information feedback through prices. They show that, in economies prone to such severe information asymmetries, banks can actually provide a better resolution of post-lending moral hazard and improve real sector decisions. The technological characteristics of an economy or the degree of agency problems it faces can also influence the comparative importance of banks and stock markets. In particular, Allen and Gale (1999) show that securities markets are better at financing new industries and technologies in economies characterized by high information uncertainty and diversity of opinion. Furthermore, in Dewatripont and Maskin (1995), a more market-based system provides better financial discipline in the presence of adverse selection by not committing to fund unprofitable projects.

The relative merits of banks and stock markets also depend on the stage of economic development and, in particular, on the legal and institutional framework of a country. Rajan and Zingales (1998) argue that banks are more effective in weak legal systems with poor institutional infrastructure, whereas the well-functioning of stock markets relies on strong contractual environments and legal enforceability. This implies that market-based systems might prevail only at higher levels of development. Finally, the distribution of risk in the economy can also impact the link between finance and the real economy. Bolton and Freixas (2000) develop a model in which more mature and safe firms rely on equity markets, while small, riskier firms are better served by banks. Stock markets are also better at providing cross-sectional risk sharing, while banks allow for more inter-temporal risk-sharing (Allen and Gale, 1997). Fecht et al. (2008) show how this risk-sharing trade-off can lead to less investment in productive assets in bank-dominated economies and hence lower growth, as compared to market-based economies.

The arguments articulated in these theoretical models imply that the services provided by banks and stock markets should exert a different impact on economic activity at different levels of development or depending on a host of country-specific characteristics. Empirical research however, has mainly investigated the overall role of financial development in real sector outcomes, and is less precise on the relative importance of either type of financial institution.

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