



# Quantifying the impact of financial development on economic development

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## ABSTRACT

How important is financial development for economic development? A costly state verification model of financial intermediation is presented to address this question. The model is calibrated to match facts about the U.S. economy, such as the intermediation spreads and the firm-size distributions for 1974 and 2004. It is then used to study the international data using cross-country interest-rate spreads and per-capita GDPs. The analysis suggests a country like Uganda could increase its output by 116 percent if it could adopt the world's best practice in the financial sector. Still, this amounts to only 29 percent of the gap between Uganda's potential and actual output.

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## 1. Introduction

How important is financial development for economic development? Ever since the publication of Raymond W. Goldsmith's (1969) classic book *Financial Structure and Development*, economists have been developing theories and searching for empirical evidence connecting economic and financial development. Goldsmith emphasized the role that intermediaries play in steering funds to the highest-valued users in the economy. First, intermediaries collect and analyze information before they invest in businesses. Based on this information, they determine whether to commit savers' funds. If they proceed, then they must decide how much to invest and on what terms. Second, after allocating funds intermediaries must monitor firms to ensure that savers' best interests are protected. Increases in the efficiency of financial intermediation, due to improved information production, are likely to reduce the spreads between the internal rates of return on investments in firms and the rate of return on savings received by savers. The spreads between these returns reflect the costs of intermediation. These intermediation wedges include the costs of gathering ex ante information about investment projects, the ex post

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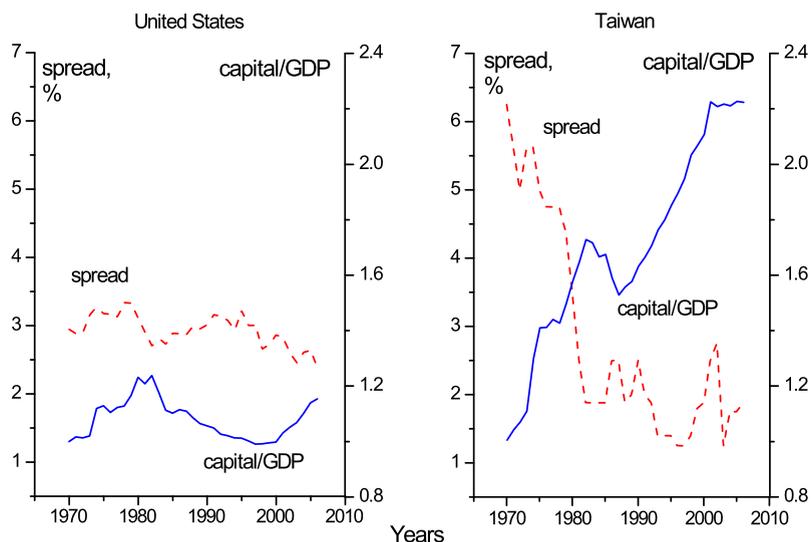


Fig. 1. Interest-rate spreads and capital-to-GDP ratios for the United States and Taiwan, 1970–2005. Data sources for all figures are discussed in Appendix A.

information costs of policing investments, and the costs of misappropriation of savers' funds by management, unions, and so on that arise in a world with imperfect information. An improvement in financial intermediation does not necessarily affect the rate of return earned by savers. Aggregate savings may adjust in equilibrium so that this return always equals savers' rate of time preference.

The left panel of Fig. 1 plots the intermediation wedge for the U.S. economy over time. (All data definitions are presented in Appendix A.) The United States is a developed economy with a sophisticated financial system. The wedge falls only slightly. At the same time, it is difficult to detect an upward trend in the capital-to-output ratio. Contrast this with Taiwan (shown in the right panel): There is a dramatic drop in the interest-rate spread. As the cost of capital falls, one would expect to see a rise in investment. Indeed, the capital-to-output ratio for Taiwan shows a significant increase. The observation that there is only a small drop in the U.S. interest-rate spread does not imply that there has been no technological advance in the U.S. financial sector. Rather, it may reflect the fact that efficiency in the U.S. financial sector has grown in tandem with the rest of the economy, while for Taiwan it has outpaced it. For without technological advance in the financial sector, banks would face a losing battle with the rising labor costs that are inevitable in a growing economy. The intermediation spread would then have to rise to cover costs; more on this later.

Now, in Goldsmithian fashion, consider the scatterplots presented for a sample of countries in Figs. 2 and 3. The left panel in Fig. 2 shows that countries with lower interest-rate spreads tend to have higher capital-to-gross domestic product (GDP) ratios. The right panel illustrates that a higher capital-to-GDP ratio is associated with a greater level of GDP per capita. Dub this the capital-deepening effect of financial intermediation. Next, turn to the left panel in Fig. 3. Observe that lower interest-rate spreads are also linked with higher levels of total factor productivity, TFP. This would happen when better intermediation tends to redirect funds to the more efficient firms. The right panel displays how higher levels of TFP are connected with larger per-capita GDP. Call this the reallocation effect arising from financial intermediation. The capital-deepening and reallocation effects from improved intermediation play an important role in what follows. While the above facts are stylized, to be sure, empirical researchers have used increasingly sophisticated methods to tease out the relationship between financial intermediation and growth. This literature is surveyed masterfully by Levine (2005). An early example of the empirical research examining the link between financial intermediation and growth is the well-known paper by King and Levine (1993). The upshot is that financial development has a causal effect on economic development; specifically, financial development leads to higher rates of growth in income and productivity.

The impact of financial development on economic development is investigated here, quantitatively, using a costly state verification model that was developed by Greenwood et al. (2010). The source of inspiration for the framework is the classic work by Townsend (1979) and Williamson (1986). It has two novel twists, though. First, firms monitor cash flows as in Townsend (1979) and Williamson (1986); however, here the efficiency of this activity depends on both the amount of resources devoted to it and the productivity of the monitoring technology used in the financial sector. Second, firms have ex ante differences in the structure of returns that they offer. A financial theory of firm size emerges. At any point in time, firms offering high expected returns are underfunded (relative to a world without informational frictions), whereas others yielding low expected returns are overfunded. This results from diminishing returns in information production. As the efficiency of the financial sector rises (relative to the rest of the economy), funds are redirected away from less productive firms in the economy toward more productive ones. Furthermore, as the interest-rate spread declines and the cost of borrowing falls, capital deepening occurs in the economy.

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