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Financial development, government ownership of banks and firm innovation

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A B S T R A C T

Using a newly-available World Bank survey of over 28,000 firms from 46 countries, we examine how financial development affects firm innovation around the world. We find that while stock market development significantly enhances firm innovation, banking sector development has mixed effects. We show that the latter result can be explained by different levels of government ownership of banks. Specifically, in countries with lower government ownership of banks, banking sector development significantly enhances firm innovation; while in countries with higher government ownership of banks, banking sector development has no significant or sometimes even significantly negative effects on firm innovation. Such negative effects are significantly stronger for smaller firms. The results are robust to various controls such as firms' human capital and ownership structure, to estimations using instrumental variable techniques and alternative measures of firm innovation.

1. Introduction

How does financial development affect economic growth? In the nearly two decades since the seminal work of King and Levine (1993a, b), economists have identified two main channels: total factor productivity and capital accumulation (e.g., Levine and Zervos, 1998). Despite abundant

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macroeconomic evidence, however, microeconomic evidence that identifies these channels is surprisingly lacking.[1] To help address this, we use a new World Bank Investment Climate Survey dataset collected from over 28,000 firms in 46 countries between 2002 and 2005 to examine the effects of financial development on firm innovation, which is a key source of growth in total factor productivity, and total factor productivity growth is the “ultimate source of long-run economic growth” (Jorgenson, 2005). Our research shows that while stock market development has positive and significant effects on firm innovation, the impact of banking sector development is mixed.

The finding for stock markets is perhaps not surprising, given that they are forward-looking and finance many risky innovative projects that involve problems of asymmetric information, skewed and uncertain returns, and lack of collateral. The ambiguous role of banking sector development, on the other hand, is somewhat puzzling, especially since banks account for a high proportion of external finance even in “market based” financial systems.[2] La Porta et al. (2002) show with macroeconomic data for 92 countries that higher government ownership of banks in 1970 is associated with significantly slower subsequent productivity growth. As firm innovation is an important source of productivity growth, we hypothesize that variations in government ownership of banks may account for the mixed effects of banking sector development on firm innovation.

To test our hypothesis, we merge the World Bank dataset with the dataset of Barth et al. (2006) on government ownership of banks in 151 countries. We split our sample into a subsample with lower government ownership of banks, and the other subsample with higher government ownership of banks. We find that in the first sample, banking sector development has positive and significant effects on firm innovation, but this relationship totally vanishes in the second subsample. We then interact the government ownership of banks with banking sector development and find the interaction term to be negatively and significantly correlated with firm innovation. This helps us explain the mixed overall effects of banking sector development on firm innovation. We also find that government ownership of banks has more adverse impact on firm innovation in small firms than for large firms. These conclusions are robust to controls for firms’ ownership structure and the human capital of their managers and employees, and to estimation with instrumental variables.

To overcome potential sample selection bias, especially the under representation of large firms, associated with the World Bank Investment Climate Survey, we complement the survey data with US patent data. Specifically, we measure each country’s innovation by counting how many patents they have filed in the US and the citations of these patents at the patent class level. The results obtained from analyzing US patent data are similar to those found in the World Bank Investment Climate Survey data.

Our study contributes to the literature in several ways. First, to our knowledge, it is the first study on the effect of country level financial development on firm innovation. Previous cross-country studies have examined other determinants of firm innovation. These studies have identified the following important determinants of firm innovation across countries: creditor rights (Acharya and Subramanian, 2009), labor protection (Acharya et al., 2010), patent laws (Moser, 2005; Qian, 2007), foreign competition (Gorodnichenko et al., 2010), domestic competition (Aghion et al., 2005), and human capital (Ayyagari et al., forthcoming). In addition, Ayyagari et al. (forthcoming) document that greater firm-level access to external finance leads to more active innovation by private firms, but not by state-owned firms. In contrast to Ayyagari et al. (forthcoming), we focus on the impact of country level financial development, specifically stock market development and banking sector development, on firm innovation.

Our study is also the first to examine the differential impact of stock market and banking sector development on firm innovation. It also appears that we are the first to examine the effects of banking sector development on firm innovation from the perspective of government ownership of banks, allowing us to contribute to the recent debate on the impact of government ownership of banks. For example, La Porta et al. (2002) offer evidence that higher levels of government ownership of banks are

[1] Beck et al. (2005) and Rajan and Zingales (1998) are notable exceptions by offering firm-level and industry-level evidence on the impact of financial development on firm and industry growth, respectively.

[2] For example, Mishkin (2004) reports that the stock market accounted for only 9.2 percent of the external financing of American businesses over the period from 1970 to 1996 while bank loans accounted for 40.2 percent.