The dynamic effects of banking, life insurance, and stock markets on economic growth

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ABSTRACT

This study provides new evidence on the long- and short-term effects of life insurance, banking, and stock markets on economic growth using the pooled mean group (PMG) technique. The sample consists of 31 countries and covers the period from 1981 to 2008. We contribute to the existing literature in two ways. First, we examine whether variations in time series averaging methods, used for a generalized method of moments estimator (GMM), affect the robustness of the effect of financial activities on growth. Second, we explore the long- and short-term effects as well as the nonlinear effect of the finance–growth nexus. The results of the entire sample analyzed using GMM and PMG estimators provide robust evidence that private credit impedes economic growth. However, the effects of life insurance and stock market on growth are not robust for GMM estimator using different time series averaging procedure. Our findings further suggest that the effects of financial activities on growth vary with the time period, income level, and financial development. That is, countries at different levels of development should engage in different financial activities to ensure sustainable growth.

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1. Introduction

The hypothesis that financial development promotes economic development has been tested in various ways; however, no conclusion has been reached. Although the empirical evidence appears heavily weighted in favor of a positive effect (King and Levine, 1993; Levine and Zervos, 1998; Levine et al., 2000; Arestis et al., 2001; Beck and Levine, 2004; Loayza and Ranciere, 2006; Cheng and Degryse, 2010), some studies have reported the opposite result (Atje and Jovanovic, 1993; De Gregorio and Guidotti, 1995; Ram, 1999; Arcand et al., 2015; Beck et al., 2014a, 2014b; Law and Singh, 2014).

Previous studies on these debates have focused on potential biases induced by simultaneity and have omitted critical variables

and non-linearity (Beck et al., 2000; Beck and Levine, 2004; Rioja and Valev, 2004a, 2004b; Arena, 2008; Cheng et al., 2014; Law and Singh, 2014). Beck and Levine (2004) and attempted to overcome the simultaneity issue by adopting the GMM technique and considering stock market development in the growth model to compensate for the omitted critical variables. They found that banking development and stock market liquidity accelerate economic growth based on a panel dataset comprising 40 countries over the 1976–1998 period. Further, by adding the potential role of insurance sector and considering nonlinear effects, Arena (2008) found evidence that the insurance sector and stock market liquidity have a positive effect on economic growth, whereas the effect of banking development on growth is insignificant. It is surprising that the addition of the insurance sector seems to dilute the positive effect of the finance–growth nexus. The findings are further confirmed by Chen et al. (2012), who concluded that the insurance sector weakens the link between banking development and economic development.

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The question then is whether financial development matters for economic growth. This study adds to the existing literature by jointly considering the banking, life insurance, and stock market sectors to examine their effects on both long- and short-term economic growth.[1] While Arena (2008) provided a comprehensive analysis, this study goes further by considering three additional aspects.

The first aspect discusses the nonlinear effect of the finance–growth relationship.[2] Arena (2008) and Chen et al. (2012) considered nonlinearity by adopting interaction terms between the financial sector and the dummy variables that capture different levels of income or financial development. Nevertheless, they can at best provide nonlinear findings for the effect of a single sector on growth while controlling for the other two sectors. To investigate the distinct effects of the three financial services on growth, this paper divides the countries evenly into two groups according to their time series average of gross national income (GNI) per capita or private credit from 1981 to 2008. After classifying the countries as appropriate, we attempt to examine whether the effects of the three financial activities on economic growth vary according to where the countries stand in terms of GNI or private credit.

The second aspect is concerned with the long- and short-term effects of the three financial activities on growth. Arena (2008) and Chen et al. (2012) examined the long-term influences of financial services on growth using the GMM estimator. However, they ignored the possible short-term relationships. Identifying short- and long-term effects may have policy implications for strategies appropriate to different periods. In addition, several theoretical and empirical studies demonstrate the distinctly long- and short-term links between finance and growth, indicating the need for considering simultaneously its short- and long-term effects in the finance–growth model (Lindh, 2000; Gaytan and Ranciere, 2003; Dell'Ariccia and Marquez, 2006; Loayza and Ranciere, 2006; Cheng et al., 2014). Hence, we adopt the pooled mean group (PMG) estimator proposed by Pesaran et al. (1999) to explain the long- and short-term effects. The PMG estimator allows the intercepts, short-term coefficients, and error-correction coefficients to be country specific but restricts the long-term coefficients to be the same. These conditions fit the purpose of this paper since the long-term relationship between financial services and growth is likely to be similar for countries with comparable characteristics. In contrast, the short-term association may be heterogeneous in nature across countries since it tends to be governed by local turmoil such as upheavals in economic conditions, laws, regulations, and government policies.

Third, this paper provides evidence that the effects of financial services on growth are robust with variations in time series averaging methods. While Arena (2008) and Chen et al. (2012) used the GMM estimator, given endogeneity, to overcome the

possibility of simultaneity, Loayza and Ranciere (2006) argued that the GMM method based on data of time series averages can induce a loss of information and hide the potential dynamic relationship between financial activities and economic growth. The averaging method is likely to confound short-term effects with long-term effects, causing difficulties in explaining the result. Therefore, providing empirical results for different time series averaging methods may help ascertain whether these methods produce unstable results.

Considering the aforementioned three aspects, this paper examines the long- and short-term effects of life insurance, banking, and the stock market on economic growth based on panel data for 31 countries between 1981 and 2008. We first examine whether the effects of financial activities on growth are robust with variations of time series averaging methods and methodologies. The findings provide robust evidence that private credit impedes economic growth while using GMM and PMG estimators, whereas the effects of life insurance and of stock market activities on growth are not robust. This suggests that different averaging methods for time series data applied to GMM estimators lead to unstable results. Next, we investigate the nonlinear relationships among banking, life insurance, the stock market, and economic growth using the PMG estimator. In all, 31 countries are segmented into high- and low-GNI groups based on GNI and into high- and low-financial development (FD) groups based on private credit. For high-GNI and high-FD groups, we find that life insurance accelerates long-term economic growth, whereas the effect of private credit on growth is negative. For the low-GNI group, the findings contend that the stock market turnover ratio enhances long-term economic growth, whereas the effect of private credit on growth is negative. Regarding the low-FD group, the results show negative effects of life insurance and stock market development on long-term growth, while the relationship between private credit and growth is positive. Finally, although private loans impede long-term growth, they enhance short-term growth, except for the low-FD group. Our findings suggest that the effect of financial activities on growth varies with the periods under consideration and the levels of economic development in countries. Thereby, countries at different levels should adopt different financial activities to ensure sustainable growth.

The rest of the paper is organized as follows. Section 2 provides a simple model to analyze the long-term effect of financial services on economic growth. Section 3 discusses the methodology, variables, and data used in the study. The empirical results are discussed in Section 4. Section 5 concludes the paper.

2. The model

Pagano (1993) provided a simple endogenous growth model to capture the potential effects of banking development on economic growth. Wu et al. (2010) modified Pagano's (1993) model and demonstrated that banking and the stock market simultaneously affect economic growth. This paper extends the models from Pagano (1993) and Wu et al. (2010) and provides a mechanism through which the banking, life insurance, and stock market sectors may affect economic performance. We follow Pagano (1993) and assume that firms produce outputs with capital having the following constant return to scale representation:

$$Y_t = AK_t \tag{1}$$

where Y_t, K_t, and A denote output, capital stocks, and the social marginal productivity of capital, respectively. The aggregate capital stock can be seen as a composite of physical and human capital (Lucas, 1988). Assuming that the economy produces a single good

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[1] Simultaneously considering the banking, stock market, and insurance sectors in the unified growth model meets the actual operations of financial markets. Levine (1997) documented that financial institutions nurture economic growth through facilitating risk amelioration, allocating resources, monitoring managers and exerting corporate control, mobilizing savings, and easing exchange that influence capital accumulation and/or technological innovation. However, these financial functions may not perform well unless credit, equity, and insurance markets coexist in the financial markets (Arena, 2008).

[2] Recent studies have indicated that the finance–growth relationship may depend critically on the country's development (e.g., Odedokun, 1996; De Gregorio and Guidotti, 1995; Acemoglu and Zilibotti, 1997; Rioja and Valev, 2004a; Cheng et al., 2014) or financial development (e.g., Rioja and Valev, 2004b; Arena, 2008; Chen et al., 2012; Arcand et al., 2015; Law and Singh, 2014). These studies together provide a solid base for the dichotomy between high and low groups, either categorized by income level or the degree of financial development, when investigating the finance-growth nexus.