Economic Modelling 32 (2013) 294–301

Contents lists available at SciVerse ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/ecmod

Economic growth and financial development in Asian countries: A bootstrap panel Granger causality analysis

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ARTICLE INFO

Article history:
Accepted 5 February 2013

JEL classification:
F43
O10
O11

Keywords:
Economic growth
Financial development
Cross-sectional dependency
Slope heterogeneity
Granger causality
Bootstrap

ABSTRACT

This study using Kónya (2006) [Kónya, L. (2006). Exports and growth: Granger causality analysis on OECD countries with a panel data approach. Economic Modelling 23, 978–992.] method of bootstrap panel Granger causality analysis, which considers the issues of cross-sectional dependency and slope heterogeneity among countries investigated simultaneously, analyzes the causality between financial development and economic growth among ten Asian countries surveyed during period 1980 to 2007. We find that the direction of causality between financial development and economic growth is sensitive to the financial development variables used in the ten Asian countries examined in this work. Moreover, our findings support the supply-leading hypothesis, as many financial development variables lead economic growth in some of the ten Asian countries surveyed, especially in China.

1. Introduction

The aim of this paper is to investigate the causality between financial development and economic growth. Among the many questions that arise about economic growth, two common ones are "why do different phenomena occur during the economic development of different countries?", and "what are the major causes of these various phenomena?" Many theories and empirical studies suggest that the development of financial markets is a key factor in this, as such markets can make a country's economic environment more efficient (Levine, 1997). From a theoretical perspective, a more financially liberal environment enables investors to more easily reduce risks via financial markets, thus lowering the cost of capital, raising the desire to invest, and ultimately leading to economic growth (Bekaert and Harvey, 2000; Bekaert et al., 2001, 2002, 2005). However, some papers have different opinions, such as Robinson (1952), which claims that financial development has no effect on economic growth. Moreover, economic growth may encourage the financial industry to provide better services, and thus economic growth can cause financial development, rather than the other way around. Patrick (1966) refers to these two different views as the supply-leading and demand-following hypotheses,[1] respectively.

In addition, some papers indicate that there is no significant relationship between financial development and economic growth, or that any relationship that exists is a negative one. Khan and Senhadji (2003) found that financial development affects economic growth in an insignificant manner, although there may be a nonlinear relationship between them. They also found that while financial development may progress slowly in some countries, economic growth may be much faster, and thus that indicators used to measure the latter cannot be used to reflect the former.

Despite the conflicting research results outlined above, many theoretical models still use the theory of endogenous economic growth to discuss the development of financial institutions (Grossman and Helpman, 1991; Khan, 2001; Lucas, 1988; Pagano, 1993; Rebelo, 1991; Romer, 1986; among others). In addition, a number of empirical studies have discussed the possibility of a two-way causality between financial development and economic growth across borders (Atje and Jovanovic, 1993; Goldsmith, 1969; King and Levine, 1993a, 1993b; Levine and Zervos, 1998). In particular, King and Levine (1993a) presented various

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http://dx.doi.org/10.1016/j.econmod.2013.02.027

[1] Patrick (1966) noted that in the case of financial development leading to economic growth, it is named the supply-leading hypothesis; in contrast, in the case of economic growth inducing financial development, it is named the demand-following hypothesis.

indicators of financial development based on the scale of financial intermediary institutions, and employed three economic growth variables (per capita real GDP growth rate, per capita capital consumption rate and aggregate production growth rate) to examine whether significant financial developments have an impact on economic development, with a specific focus on economic growth, capital accumulation and efficiency improvement. The panel data used in their study was cross-sectional and covered 80 countries for the time period 1960–1989, and the results showed that a country's level of financial development can predict its level of economic growth. Demetriades and Hussein (1996) concluded that both financial development and economic growth are connected, based on a study using panel data from 16 countries covering the period 1960–1990. Rousseau and Wachtel (2005) analyzed panel data from 84 countries and used the rolling regression approach to examine the relationship between financial development and economic growth during the period 1960–2003, and found that (i) the relationship became gradually less clear, especially for later research period, and (ii) less developed countries had clearer relations between the two, while the reverse was true for more developed ones. Kemal et al. (2007) surveyed panel data from 19 highly developed countries and also obtained similar results, finding that there were no causality between financial development and economic growth.

However, an examination of these earlier works that carried out multinational research shows that they often imposed too many assumptions during the estimation process. More recently, Kar et al. (2011) used the method from Kónya (2006) to examine the causality between financial development and economic growth. In particular, they allowed the condition of cross-sectional dependence, and their findings show no evidence of causality between financial development and economic growth. This supports the argument in Lucas (1988) that the role of financial institutions is sometimes overemphasized during the process of economic development.

Many Asian countries underwent a process of rapid economic development from the 1960s to 1990s, which improves their living quality, especially for Taiwan, Hong Kong, Korea, and Singapore. Examining these countries, many scholars have concluded that a stable macroeconomic environment, such as low inflation, balanced fiscal policy, a large amounts of foreign exchange, are key factors for such economic growth. However, Fase and Abma (2003) noted that the development process that has occurred in many Asian countries is different from that in other regions, and thus care must be taken when considering issues of causality. In fact, during their early development process some countries gradually liberalized their financial markets in order to attract foreign capital, and in later periods economic growth became so rapid that domestic capital was overwhelmed. Finally, the number of non-performing loans rose dramatically in many countries, leading the Asian financial crises in 1997.

Still, it is widely accepted that the development of financial markets has had a very relationship with economic growth in many Asian countries. For example, Habibullah and Eng (2006) stated that the liberalization of government monetary policies in this region enabled financial markets to develop more efficiently, and looking at the figures for M1/GNP and M2/GNP from a number of Asian countries, most show a stable growth trend. Based on an increasing rate of corporate investment, these countries saw rapid economic growth, with lead to a need for greater financial development. Their findings revealed that among 13 developing Asian countries financial development had a significant influence on economic growth, and these results have been echoed in other studies (Calderon and Liu, 2003; Christopoulos and Tsionas, 2004; Fase and Abma, 2003).

However, many studies that carry out multinational empirical analyses do not deal with causality in a systematic fashion, and thus there are conflicting findings depending on the countries surveyed and time periods examined. For instance, in recent papers conducting panel data analyses, if we estimate the parameters from cross section and time series data, there is likely to be a problem with biased estimations (Levine, 2005). Moreover, many panel time series analyses often assume slope homogeneity or cross-sectional independence, which may lead to incorrect causal inferences (Bai and Kao, 2006). Habibullah and Eng (2006) used the GMM method to overcome the problem of endogeneity that can arise from the causality between the explanatory and explained variables. However, estimations carried out with the GMM-system method are under the assumption of slope homogeneity. Another panel data causality test was presented by Hurlin (2008), and while it also has the assumption of slope heterogeneity, still does not consider the issue of cross-sectional dependency.

Therefore, this paper follows the method presented in Kónya (2006), and the advantage of this is that it considers the issues of coefficient heterogeneity and cross-sectional dependency concurrently, while examining the test of panel data causality. This approach is carried out under the structure of SUR (seemingly unrelated regression) via the Wald test to assess the causality along with critical values simulated by bootstrap method. It can estimate the coefficients of each country individually under panel data causality, and dealing with the problem of cross-sectional dependence at the same time. Using the method for Asian countries is especially appropriate, because of the different degrees of economic development among them (i.e., the existence of coefficient heterogeneity), and it is also able to represent the close relations while they encounter significant financial events (i.e., the existence of cross-sectional dependence).

Kónya's (2006) method of bootstrap panel Granger causality is thus used to analyze the causal relations among ten Asian countries over the period 1980 to 2007. The findings show that the direction of causality between financial development and economic growth is sensitive to the financial development variables used in ten Asian countries surveyed. The other findings are as follows: First, some of the financial development variables have one-way Granger causality from financial development to economic growth, and this is true for Malaysia, Indonesia, Korea, Singapore, Thailand, Taiwan and China. The phenomenon is especially clear in China, and all three financial development variables surveyed in this work lead real GDP, thus supporting the supply-leading hypothesis. Secondly, for the M1 variable there is one-way Granger causality from economic growth to financial development in Malaysia. Thirdly, there is no causality between financial development and economic growth in the Philippines, India or Japan. Therefore, our findings mainly support the supply-leading hypothesis, as many financial development variables lead economic growth in some of the ten Asian countries surveyed in this work.

The paper is organized as follows: Section 2 presents the theoretical structure of financial development and economic growth, and the data used in this study. Section 3 presents a brief discussion of the cross-sectional dependence test, the slope heterogeneity test and the bootstrap panel Granger causality test proposed by Kónya (2006). Section 4 first presents our empirical results, and then discusses some economic and policy implications of our empirical findings. Finally, Section 5 summarizes our conclusions.

2. Theoretical structure and data

Following previous empirical studies of the Granger causality between financial development and economic growth, our model is as follows:

$$Y = f(X) \tag{1}$$

where Y denotes the economic growth in terms of real GDP, and X denotes the variables of financial development. First, we assume that economic growth is influenced by the variables of financial development, and then carry out the causality test. We then exchange the explained and explanatory variables and observe the causal relationship again. The proxy of economic growth is real GDP, in which the year 2005 is set as the base period. Additionally, to obtain more data and enable