Economic Modelling 36 (2014) 370–377

Contents lists available at ScienceDirect

Economic Modelling

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

A revalidation of the savings–growth nexus in Pakistan

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ARTICLE INFO

Article history:
Accepted 1 October 2013

Keywords:
Cointegration
Causality
Economic growth
Savings
Pakistan

ABSTRACT

The aim of this study is to understand the relationship between savings and economic growth in Pakistan over the period 1971–2011. The cointegration and the Granger causality tests are adopted to examine the relationship between the variables. The results confirm the existence of long-run equilibrium among the variables of interest. Meanwhile, savings have positively affected economic growth in both the short run and long run. The Granger results also show that savings Granger-cause economic growth. Based upon these findings, we confirm that savings is a catalyst of growth for the Pakistani economy. Additionally, our results seem more likely to support the capital fundamentalists because the long run estimation as well as the Granger causality results also indicates that savings growth can effectively spur economic growth in Pakistan.

1. Introduction

The role of domestic savings in the process of economic growth has been a perennial issue in economic literature because it matters for the modelling of effective growth policy. This is the so-called savings–growth nexus. The fundamental problem of the savings–growth nexus is the direction of causality between savings and economic growth. Does savings Granger-cause economic growth, or the other way around? For the sake of brevity, there are two renowned schools of thought that rooted out the causal link between savings and economic growth. The first school of thought — capital fundamentalists stressed that capital accumulation is the key to economic growth (e.g. Domar, 1946; Harrod, 1939; King and Levine, 1994; Lewis, 1955; Romer, 1986; Solow, 1956). To accumulate capital, one should save. In this vein, economic growth of a nation largely depends on its ability to save and the direction of causality should run from savings to economic growth. Conversely, the second school of thought — Keynesian theory argued that savings is a leakage and is dependent on the level of income or the growth of income (e.g. Keynes, 1936).[1] For this reason, savings is a consequence rather than effect of economic growth. Thus, the direction of causality should run from economic growth to savings rather than on the other way around. Over the past few decades, substantial empirical studies had examined the savings–growth nexus in both developed and less developed countries. Empirical studies on this topic jointly exhibited that savings and economic growth are closely related, but its causal relationship remains controversial. Some empirical studies support the Keynesian theory — unilateral causality running from economic growth to savings (e.g. Agrawal et al., 2010; Mavrotas and Kelly, 2001; Odhiambo, 2008; Shahbaz and Khan, 2010). Ironically, there are also substantial empirical studies which defended the view that savings induce economic growth through its impact on capital formation (e.g. Alguacil et al., 2004; Looney, 1996; Masih and Peters, 2010; Tang, 2008; Tang and Ch'ng, 2012; Tang and Chua, 2012) which is corroborated with the thought of capital fundamentalists. According to Deaton (1995), determining the relationship as well as the direction of causality is not just for understanding the role of savings in the process of economic growth, but it is also important for the design of appropriate policy. Therefore, to establish a further research for the savings–growth nexus is of utmost importance.

This study attempts to enrich the existing literature by providing some empirical evidence on the linkages between savings and economic growth in Pakistan over the period of 1971 to 2011. The Pakistani economy is the focus of this study due to several reasons. Pakistan is one of the impressively growing and high savings rates countries in South Asia. Since 1947, Pakistan's economic performance is remarkable and the average growth rate of real Gross National Product (GNP) is around 5% per annum from 1960 to 2008 (see also Ahmed, 1994; Siddiqui, 2006). Couple with that, the average savings rates of the Pakistani economy are 24% per annum from 1980 to 2008 which is very close to the savings rates reported in the middle- and high-income countries (i.e. 23 to 25% per annum). Therefore, it is very interesting to analyse the savings–growth nexus for the Pakistani economy. Unlike the earlier studies for Pakistan, where most of them were focused on the determinants of savings behaviour, this study employs the growth framework proposed by Mankiw et al. (1992) to examine the role of savings in economic growth. Although the growth framework has been used extensively in many areas of empirical studies,

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[1] See also *Relative Income Hypothesis* (RIH) — Duesenberry (1949), *Life Cycle Hypothesis* (LCH) — Modigliani and Brumberg (1954) and Modigliani and Ando (1963), and *Permanent Income Hypothesis* (PIH) — Friedman (1957).

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http://dx.doi.org/10.1016/j.econmod.2013.10.012

hitherto, it has not been considered for the savings–growth nexus in Pakistan. By using the growth framework, we are allowed not only to examine the causal relationship, but also to assess the magnitude of savings on economic growth in Pakistan. Second, we employ the Augmented Dickey–Fuller (ADF) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS, Kwiatkowski et al., 1992) unit root tests to determine the order of integration of each series. Third, to complement and check for the robustness of cointegration results, we examine the presence of a long-run relationship using both the bounds testing approach to cointegration (Pesaran et al., 2001) and also the Bartlett-corrected trace test for cointegration (Johansen, 2002). Then, we have also used four long-run estimators to estimate the long run relationship: (a) the autoregressive distributed lag (ARDL) developed by Pesaran and Shin (1999), (b) the fully modified ordinary least squares (FMOLS) proposed by Phillips and Hansen (1990), the dynamic ordinary least squares (DOLS) suggested by Stock and Watson (1993), and ordinary least squares (OLS) proposed by Engle and Granger (1987). Finally, unlike the earlier studies on the savings–growth nexus in Pakistan, we apply the Modified Wald (MWALD) causality test (Toda and Yamamoto, 1995) together with the leveraged bootstrap simulation procedure to compute more reliable critical values for Granger causality test. Therefore, the estimation results of this study are more robust and realistic.

The remainder of the paper will be organised as follows. In the next section, we discuss the literature survey of the related growth theories and savings–growth nexus. Section 3 explains the theoretical framework and model specification used in this study. In Section 4, we present the data source and econometric approaches employed in this study. The empirical results will be discussed in Section 5 and ultimately, the conclusion and policy recommendations will be presented in Section 6.

2. Literature survey

2.1. Reviews of growth theories

Retrospectively, Adam Smith was the first economist who advocated the importance of capital accumulation in the process of industrialisation and economic growth (Ghosh and Ghosh, 1991). Smith documented that capital accumulation is strongly dependent on the rate of savings of a country as a whole because the portion of which an individual saved will automatically be transformed into capital. Therefore, an increase in the rate of savings will boost up the rate of economic growth. During the transition period from classical to neoclassical thought of economics, two economists, Roy Forbes Harrod of England and Evsey Domar of Massachusetts Institute of Technology (MIT) developed an important growth model to study the requirement of steady growth in an economy (Domar, 1946; Harrod, 1939). This is also known as the Harrod–Domar growth model stress on the accumulation of capital. This model argued that at a given level of technology (i.e. no technological progress) the rate of economic growth is proportionate to the rate of capital accumulated because they assumed that there is a fixed relationship between capital and output (i.e. the capital–output ratio). As savings is the main source of capital accumulation which is required to finance investment, they concluded that higher savings rates will enhance investment, and thus lead to economic growth. In other words, economic growth is a function of the ability of an economy to save.

Robert Solow and Trevor W. Swan were the primary drivers of the neoclassical growth theory (Solow, 1956; Swan, 1956). They extended the Harrod–Domar growth model by including labour force as a second factor of production to study how economic growth is generated. Under this growth theory, there are three basic sources of economic growth namely savings, population (labour force), and technological progress (the residuals of the growth model). According to the neoclassical growth theory, savings is an important source of investment (capital formation) that will lead to economic growth. Contrary to the assertion of the Harrod–Domar growth model, neoclassical growth theory sees that increases in the savings rate will raise growth rates only in the short run while it would not continuously affect growth rates in the long run because the theory assumed that the production function follows the *law of diminishing returns to scale* where increases of capital per worker will increase the output at a decreasing rate. Therefore, neoclassical growth theory indicates that when economies reach the steady-state, change in the savings rate will have no impact on growth. In other words, a higher savings rate will not permanently raise the growth rates, but it is only to raise the growth rates temporarily during the transition from the initial steady-state to a new steady-state. According to this theory, the only way to maintain economic growth is to ignite technological progress to improve the efficiency of investment by shifting the production function upward. In this respect, economic growth is determined exogenously by the technological change. Therefore, the neoclassical growth theory is also known as the exogenous growth theory.

Even though the neoclassical growth theory provides a relatively useful platform to understand how economic growth is generated and what factor drives economic growth in the short and long run, it is still imperfect owing to the unrealistic assumptions of the real world. For instance, the theory simply assumes that the savings rate, the skill level of the labour force, the level of technology, and the growth rate of the population are exogenous. So, the neoclassical growth theory claimed that savings do not matter for the long run economic growth. In reality, the values of these variables are not exogenous, but they may be partially determined by economic structure, public policy, and the process of growth itself. Sato (1964) found that it is too long to adjust from one steady-state of equilibrium to another steady-state of equilibrium because the adjustment process will take more than a century. As a result, the role of savings in the process of economic growth remains vital.

Obviously, the main shortcoming of the neoclassical growth theory is its ability to explain the process of long run economic growth as the theory assumed the diminishing return to capital and the constant return to scale. The shortcoming of this growth theory has ignited the interest of another group of economists (e.g. Paul Romer and Robert Lucas) to develop a so-called new or endogenous growth theory in the 1980s to further explain the determinants and the process of economic growth (Lucas, 1988; Romer, 1986). The basic idea of the endogenous growth theory was an extension of the work did by Joseph A. Schumpeter in the 1930s and 1940s. Interestingly, the endogenous growth theory assumed that the national economy is characterised by increasing returns to scale rather than constant return to scale as emphasised by the neoclassical growth theory. That is, an increase of output is greater than the increase of capital, labour and other factors of production. Therefore, the production function does not follow the law of diminishing returns. According to the endogenous growth theory, investment in research and development (R&D) and human capital not only benefits the investors but also others in the economy. This benefit is known as a positive externality. For example, investment in R&D may discover not only new products and procedures, but also better-quality equipment and machinery, and increased in knowledge of know-how. In addition, investment in human capital required to support the R&D and investment in human capital are not subject to the law of diminishing returns. If the positive externality from new investment is large enough, the law of diminishing return does not necessarily apply and does not necessarily reach the steady-state of equilibrium as the notion of the neoclassical growth theory. For this reason, endogenous growth theory argued that an increase in the savings rate and hence in the rate of investment, will result in a permanent increase in the growth rates of output over the long run.

2.2. Review of studies on the savings–growth nexus in Pakistan

It is vital for policymakers to understand the effect of savings on economic growth, in particular the direction of causality between savings and economic growth. Given the policy relevance of estimating the