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SOURCES OF GROWTH REVISITED: THE IMPORTANCE OF THE NATURE OF TECHNOLOGICAL PROGRESS

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Traditional sources of growth studies generally assume that the nature of technological progress is Hicks-neutral. However, the nature of technological progress compatible with steady state conditions is Harrod-neutral rather than Hicks-neutral. This study thus investigates sources of growth for Hong-Kong, the Republic of Korea, Singapore and Taiwan using the bounds testing procedure of Pesaran, Shin and Smith (2001) and the autoregressive distributed lag (ARDL) approach of Pesaran and Shin (1999). The robustness of the test results and parameter estimates are also justified by the fully modified ordinary least squares approach of Phillips and Hansen (1990). The results emphasize that the fundamental source of economic growth is technological progress in the short-run.

JEL classification codes: O30, O47, O57, C22.
Key words: economic growth, technological progress, the bounds testing approach, ARDL, FM-OLS

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I. Introduction

This study explores sources of economic growth for Hong Kong, Republic of Korea, Singapore and Taiwan, contributes to the debate over whether the sources of economic growth stem from technological progress or capital accumulation in East Asian economies, and deliberates on the identifying assumption generally used in growth accounting studies. Traditional sources of growth studies assume the nature of technological progress to be Hicks-neutral (Solow 1957: 312; Barger 1969: 144; Nishimizu and Hulten 1978: 352; de Gregorio 1992: 64; Senhadji 2000: 132; Altug, Filiztekin and Pamuk 2008: 403; Fuentes, Larrain and Schmidt-Hebbel 2006: 121; Abu-Qarn and Abu-Bader 2007: 753; van der Eng 2010: 295). The present study argues against this assumption. Although several studies based on time series econometrics implicitly or explicitly assume that there are long-run equilibrium relationships and steady state conditions, they also assume Hicks-neutral technological progress (Senhadji 2000; Abu-Qarn and Abu-Bader 2007). However, if there are steady state conditions, the nature of technological progress should be assumed to be Harrod-neutral (see Uzawa 1961).

This study considers the economies of Hong Kong, the Republic of Korea, Singapore and Taiwan, known as the "East Asian Tigers". These economies enjoyed a remarkable record of high and sustained economic growth over three decades from the mid-1960s to the early 1990s. Their ability to achieve fast economic growth has led many economists to wonder whether it stems from capital accumulation or technological progress. Collins and Bosworth (1996) emphasise that East Asian economies are distinguished by the magnitude of their capital accumulation and that the contribution of productivity is quite ordinary. Young (1992, 1994, 1995) and Kim and Lau (1994) suggest that productivity growth in East Asia is unimportant and that the main source of growth is capital accumulation. Park and Ryu (2006) show that physical capital accumulation is an important source of economic growth in East Asian economies when a homothetic function is used, whereas it is technical progress in the Cobb-Douglas production function with constant returns to scale. Klenow and Rodríguez-Clare (1997) report that technological progress account for the most growth in output per worker in Hong Kong, the Republic of Korea, and Taiwan.

This study asks the following question: What are the theoretical and empirical results of assuming the nature of technological progress as Harrod-neutral in growth accounting for the four "East Asian Tigers"?