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# Underpinnings of Taiwan's economic growth: 1978–1999 productivity study

Chi-yuan Liang<sup>a,\*</sup>, Jia-yuan Mei<sup>b</sup>

<sup>a</sup>*The Institute of Economics, Academia Sinica, No. 128, Sec. 2, Taipei, Taiwan, ROC*

<sup>b</sup>*Directorate-General of Budget, Accounting and Statistics, Taiwan, ROC*

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## Abstract

The objective of this paper is to measure the growth of TFP in 36 sectors and the whole of the economy of Taiwan during 1978–1999 by using detailed sectoral data that are adjusted in order to account for input–output tables and the capital utilization rate. The major findings are as follows. First, for the Taiwan economy as a whole, the TFP growth rate is estimated to be 3.01% per annum during the whole of the 1978–1999 observation period, while it is estimated to be 2.95% after adjusting for the capital utilization rate. Second, the relative contribution of TFP adjusted during 1978–1999 for the capital utilization rate to output growth is found to be as high as 41.0%, which is close to the relative contribution of the capital input (46.2%) and much higher than the relative contribution of the labor input (12.8%). Consequently, the Krugman–Kim–Lau–Young hypothesis, i.e. the ‘input-driven growth’ hypothesis is found not to apply to Taiwan during 1978–1999. This finding reinforces the conclusions of Liang (1995) and Liang (2002).

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## 1. Introduction

Since the 1950s, Taiwan's economic performance has attracted worldwide attention and has been a major source of pride at home. Over the past five decades, the average annual economic growth rate has been as high as 8.4%. More specifically,

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\* Corresponding author. Tel.: +886-2-27822791-322; fax: +886-2-26539314.

*E-mail address:* [cliang@econ.sinica.edu.tw](mailto:cliang@econ.sinica.edu.tw) (C.-y. Liang).

it has averaged 8.0% during the 1950s, 9.6% during the 1960s, 9.7% during the 1970s, 7.9% during the 1980s and 6.5% during the 1990s. Though the growth of the economy has been slowing down since the 1980s, this is actually not a major concern since an economy's growth level generally depends on the stage of its development. Nonetheless, Taiwan has certainly been undergoing dramatic structural changes. Alongside the phenomenal economic growth, the production costs have, on the one hand, been mounting at an even more rapid pace, which has resulted in the re-location of the so-called 'traditional industries' to the Southeast Asian countries and to mainland China since the mid 1980s. However, the advent of information technology has brought about the rapid growth of 'high-tech' companies in Taiwan. With such enormous changes, it is important to understand how Taiwan's different industries, both the survivors and the newcomers, have been affected, and to take the industrial changes into account when measuring productivity for the economy as a whole.

The discussion over the issue of productivity in NIEs (newly industrializing economies) and other Asian Tigers has never stopped in international economic circles. The topic has attracted even more interest since the publication of Krugman's paper 'The Myth of the Asian Miracle' [Krugman \(1994\)](#), as well as the subsequent criticism of it and the occurrence of the Asian financial crisis in 1997. In his controversial article, Krugman used the calculations of [Kim and Lau \(1994\)](#) and [Young \(1994a\)](#) and particularly [Young \(1994b\)](#) in regard to the NIEs' annual growth rate of GDP and total factor productivity (TFP) over the 1966–1990 period. He went on to conclude that the rapid expansion in East Asia was largely achieved through heavy inputs of capital and labor rather than through productivity gains from technological advances. He also likened this region to the Soviet Union and predicted that once inputs were exhausted and capital-to-output ratios had risen close enough to levels found in rich countries, diminishing returns would set in and economic growth would quickly slow down.

In response to the Krugman–Kim–Lau–Young 'input driven growth' hypothesis, [Liang \(1995\)](#) extended the research approach developed by [Jorgenson et al.—Christensen and Jorgenson \(1970\)](#) and [Gollop and Jorgenson \(1980\)](#)—by regarding the changes in the quality of inputs caused by industrial structural change or the 'reallocation effect of inputs' as [Liang \(2001\)](#) called it, as another heterogeneous characteristic of inputs. In so doing, he measured Taiwan's TFP growth during different sub-periods between 1961 and 1993. He argued that the 'input driven growth' hypothesis proposed by Krugman et al. was at least in Taiwan's case, valid only for a longer period, say, 1961–1993, but invalid for 1982–1993. According to his computations, Taiwan's annual TFP growth rate was 1.4% over the whole period 1961–1993. It did, however, surge from 0.2% during 1961–1982 to 3.45% during 1982–1993. He argued that the trend instead of average was more important when it come to making predictions concerning the future. [The Economist \(1997\)](#) similarly criticized Krugman's Thesis and remained optimistic regarding East Asia's future development.

In spite of the disputes over such theoretical territory, what actually happened in the practical world, i.e. the Asian Financial Crisis, plausibly supported Krugman et al.

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