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Foreign investment, human capital and manufacturing sector growth in Singapore

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Abstract

Foreign investment has been long regarded as the main driver of Singapore's manufacturing sector growth. By making use of annual data for the period 1980–2005, this paper argues that in addition to foreign investment, human capital is also playing a significant role in foresting manufacturing sector growth in Singapore. Empirical analysis shows that foreign investment, human capital and value added in manufacturing are cointegrated. The paper also argues that continued growth into the future requires further diversification of the manufacturing sector and increased spending on R&D and advanced education.

JEL classification: F21; F23; F36

Keywords: Foreign investment; Human capital; Singaporean manufacturing sector

1. Introduction

Until 2003, the performance of Singaporean economy in the post-Asian crisis period was well below its pre-Asian crisis level. However, an increase in domestic demand, growth in the US economy and early signs of recovery in the Japanese economy combined with the recent increase in the price of oil have contributed to strong growth in Singapore in 2005 and 2006. While the economy has registered strong growth in recent years, rising unemployment and shrinking profit margins have increased hardship faced by the general population.[1] The

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[1] The unemployment rate increased from 1.4% in 1997 to 4.0% in 2003. The unemployment rate in 2005 and 2006 respectively was 3.1 and 2.7% (Department of Statistics, 2007).

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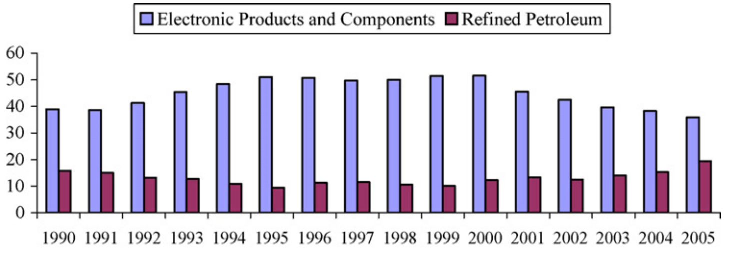

Fig. 1. Output share of selected manufacturing industries as a percentage of total (1990–2005).

national saving rate registered a steep decline in 1998–1999 and 2001–2002. It is interesting to note that Baharumshah, Thanoon, and Rashid (2003) appear to suggest that the savings rate in Singapore has not greatly influenced its economic growth. The manufacturing sector has long been regarded as the main driver of Singapore's impressive economic growth. Prior to the emergence of China as a major supplier of manufactured goods, the Singaporean manufacturing sector was facing stiff competition from regional economies such as Malaysia and Thailand. In response to increased competition and rising relative labour cost, Singapore took steps to move away from the production of low-value-added manufactured goods to high-value-added manufactured goods. At the same time, the Singaporean government significantly increased its spending on research and development which contributed to a steep increase in the number of research scientists and engineers (up from 4329 in 1990 to 21,338 in 2005).[2]

The average share of manufacturing in Singapore's GDP from 2000 to 2006 has been approximately 25%. However, the manufacturing sector is not well diversified. Fig. 1 shows that more than 50% of the manufacturing sector output consists of just two industries: (i) electronic products and components and (ii) refined petroleum.[3] Fig. 1 shows that the share of electronic products and components has been declining since 2001, whereas the opposite is true for refined petroleum.

A rapid increase in China's export of manufactured goods has implications for Singaporean manufacturing sector. This paper attempts to examine the performance of Singaporean manufacturing sector. Unlike the existing studies, this paper focuses on the real value added of Singaporean manufacturing establishments. Since registering a steep decline in 2001, the value added has been steadily rising.

While the contribution of foreign investment to Singapore's economic growth in recent years appears to have significantly declined, the manufacturing sector still relies heavily on foreign investment.[4] A number of studies, including Lucas (1988) and Romer (1990), have highlighted the importance of human capital in the process of economic growth. However, few available studies have attempted to examine the impact of human capital on Singapore's manufacturing sector growth. Up until the 1970s, Singaporean manufactured exports consisted largely of low-value-added labour intensive goods. During the 1980s, the Singaporean manufacturing sector moved towards the production of higher value-added goods. Production of such goods requires significant amount of physical as well as human capital.

[2] While the private sector R&D expenditure as a percentage of total remains well above 50%, government spending on R&D increased from S$262.2 million in 1990 to S$1.55 billion in 2005 (Department of Statistics, 2007).

[3] This point has also been made by Leung, Tan, and Yang (2004)—they argue that Singapore government has used targeted-investment policies.

[4] MAS (2006) reports that the average contribution of foreign investment in Singaporean economic growth over the period 1998–2005 was −0.5% per annum compared to 3.8% per annum for the period 1990–1997.