EXPLAINING TOTAL FACTOR PRODUCTIVITY TRENDS IN BUILDING CONSTRUCTION: EMPIRICAL EVIDENCE FROM HONG KONG

K.W. CHAU

Department of Real Estate and Construction, The University of Hong Kong, Pokfulam Road, Hong Kong or hrrbckw@hku.hk

Abstract
This paper attempts to explain the total factor productivity (TFP) trend in Hong Kong’s building industry. Two major forces that shaped the TFP trend over the period 1972-2005 are identified. First, empirical evidence from Hong Kong suggests that technological progress from imported technologies has been the major source of long term TFP growth in the building industry. However this source of TFP growth is diminishing, as the technology gap between Hong Kong and other technologically advanced countries narrows over time. Second, short-term fluctuations in the TFP trend can be explained by movements in the real interest rate due to "time compression diseconomies". An increase in ex post real interest rate will increase the developer's cost of holding undeveloped land, which causes developers to accelerate the rate of development at the expense of the higher cost of construction. This will have a negative, but short term, impact on the industry level TFP trend.

Keywords
Catching-up hypothesis, Hong Kong, time compression diseconomies, total factor productivity.

INTRODUCTION

TFP is defined as the ratio of the total gross output of the construction industry to all the resources required to produce the output within the same time interval. Previous studies in the US and Europe suggested that research and development is the key factor that drives productivity growth. However, this may not have been the case for Hong Kong. Since Hong Kong was technologically much less advanced compared to the US, Europe, and Japan during the 1970s and 1980s, a major source of its productivity growth could be technology transfers from other countries, since it was cheaper to import advanced technologies than to reinvent the wheel. Therefore, productivity can grow with no or insignificant investment in research and development. This phenomenon is also known as the "catching-up" process. The catching-up hypothesis implies that productivity growth in Hong Kong's building industry will slow down as its technological capability level catches up with those in the technologically more advanced economies until there is a significant increase in research and development investment.

Empirical observations suggest that growth in TFP is never smooth, but fluctuates over a long-term trend. Such TFP fluctuations are thought to be random noises, so very little attention has been paid to why TFP fluctuates. This paper proposes that fluctuations in industry level TFP trends in the building industry can be explained by the "time compression diseconomies" suggested by Dierickx et al. (1989), which state that increasing the speed of production will have a negative impact on productivity. This paper argues that developers will increase the speed of construction when the real interest rate increases so as to lower the cost of capital locked in uncompleted development projects. This will have a negative impact on TFP in the building industry, but would reverse as the real interest rate declines.