



# Managing innovation for economic development in greater China: The origins of Hsinchu and Zhongguancun

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## A B S T R A C T

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This paper reports on the preliminary findings from a three-year research project exploring the growth of information technology (IT) clusters in Hsinchu, Taiwan and Zhongguancun, China. Drawing on the history of the origins of IT clusters in these two cities, we examine the formation of clusters to understand the mechanisms and factors, such as technological change and institutional reform, which influenced the formation of these clusters. We discuss the issues concerning the process of managing innovation, the conditions that trigger and/or maintain innovation, and the source of technology for innovation. We conclude that successful innovation in origins of IT clusters is a result of the interplay between the state, the market, and the NGOs.

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## 1. Introduction

The question of how to grow the national economies of developing countries has engendered much debate since the end of World War II, as the number of newly independent countries multiplied. Emerging from different historical, cultural, and political traditions, these newly founded countries in Asia, Africa, and Latin America shared one economic feature: poverty. Worse, the gap in per capita GNP between them and the developed countries was widening: in 1970, the latter averaged 14.5 times the per capita GNP of the former; while in 1990, the figure rose to 24 [1].

Alleviating poverty in developing countries has been the goal of economic development theories. Since the 1960s, an important aspect of this debate has dealt with the pros and cons of the market mechanism and state intervention in the process of economic catch-up. Early theories argue that the invisible hand of the market is the most efficient method of allocating resources for economic development, and they suggest that the only role of the state is to provide the necessary infrastructure [2,3]. In contrast, later theories maintain that the state should take a more active role than just providing infrastructure. They contend that the developmental state could allocate resources as efficiently as the market does by cooperating, disciplining, and governing the local firms as long as the government keeps its embedded autonomy in the economy [4–7].

By the late 1990s, nongovernmental organization (NGO) theories entered the debate more seriously. They focused on the rise of different sorts of NGOs, like trade associations and nongovernmental research institutes, and highlighted the neither-state-nor-market feature of development strategies [8,9]. Nevertheless, in theory as in practice, it is arguable whether it is the state, the market, or the NGO that is the key to economic development.

Some scholars have tried to swim against the tide, calling for an end to such ideological debates. Lindauer and Pritchett ([10], p.15) pleaded for a “less polemic, more nuanced discussion.” In *Towards a New Paradigm for Development: Strategies, Policies and Processes*, Stiglitz ([11], p. 9) stated that “the issue [of development] is one of balance, and where that balance is

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may depend on the country, the capacity of its government, the institutional development of its markets.” These scholars suggest that there is a need to strike a balance among the three sectors and that developing economies require all three. For example, Perez-Aleman [12] went a step further to delineate how the three sectors could work together. In Chile’s economic development, the state took steps to redefine the role of associations, which, instead of managing with the goal of getting something from the state, became development-oriented, cooperating with the government to help local firms enhance their ability to compete in international markets.

Complementing the aforementioned strand of research, this article, based on empirical observation in Greater China, challenges the dichotomy in the literature of economic development, especially between those who emphasize the role of government in formulating and implementing economic development, and those who underline the fruits of development as predetermined by market competition. It goes further to maintain that successful innovation in origins of information technology (IT) clusters is a result of the interplay between the state, the market, and the NGOs.

Following Perez-Aleman [13], who suggested that focusing on a particular cluster, rather than on aggregate macro economy, could help to identify specific institutional actors involved and further expose the way in which they interact with each other, this article conducts research on the origins of technological clusters in Hsinchu and Zhongguancun, cradles of IT industries in Taiwan [14] and China [15], respectively. Hsinchu, 70 km southwest of Taipei, is regarded as the “Silicon Valley of the East” [16], the world’s fourth largest semiconductor producer. In 2006, it reached an output worth USD \$12.2 billion, accounting for more than 4% of the world total of USD \$260 billion. Meanwhile, touted as China’s Silicon Valley [15], Zhongguancun covers 100 km<sup>2</sup> in northwest Beijing. It generated an industrial output worth USD \$90.8 billion in 2005, with an 8.6% growth from 2004. Its growth was likened to the “Renaissance in Europe or the Meiji Restoration in Japan” [17].

The key perspective advanced in this article is that dynamic interaction of the government, the NGOs, and the market sparks the formation of IT clusters for economic development, as shown in Fig. 1. The three steps in the embryonic origin of Hsinchu will be analyzed as follows:

Step 1: The Taiwanese government built the Industrial Technology Research Institute (ITRI) in Hsinchu in 1973 in response to a series of economic and political crises.

Step 2: The ITRI initiated Taiwan’s first-ever technology transfer from the U.S. in 1976.

Step 3: The United Microelectronics Corporation (UMC) was founded in 1980 in order to fill local market needs for semiconductors.

After Taiwan’s case, the origin of Zhongguancun will be studied as follows:

Step 1: China’s first techno-entrepreneur Chunxian Chen took a business initiative in Zhongguancun in 1980 after his visits to Silicon Valley in the United States.

Step 2: Chunxian Chen founded Lenovo in 1984 and inspired many scientists and engineers of research institutes in Zhongguancun.

Step 3: The government, taking into account the increasing number of start-ups, took action to formulate economic policies in 1988 and further the development of Zhongguancun.

## 2. Research approach

This paper reports on the preliminary findings from a three-year research project exploring the growth of IT clusters in Hsinchu and Zhongguancun in light of the interplay of the state, the market, and the NGOs. Inspired by Malerba et al. [18], this

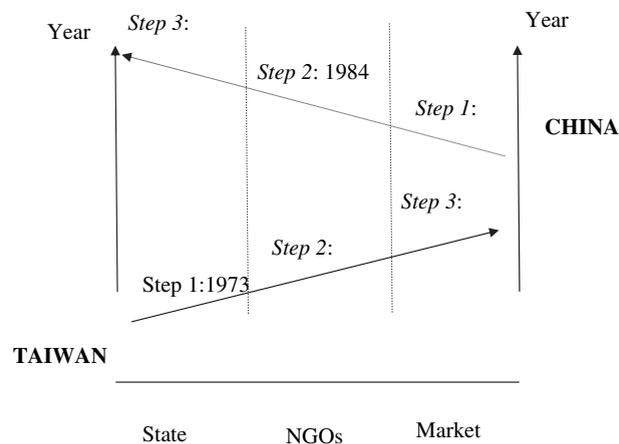


Fig. 1. The first three steps in the origins of Hsinchu (Taiwan) and Zhongguancun (China).

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