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Government programmes in financing innovations: Comparative innovation system cases of Malaysia and Thailand

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A B S T R A C T

This paper explores the main government programmes in financing innovations using comparative innovation system cases of Malaysia and Thailand, the emerging tigers of Asian economies. The study provides an empirical evidence of the innovation financing system based on the National Innovation System (NIS) concept. The main argument of the paper is that the role of the state (government's role) is necessary to improve a country's absorptive capacity in order to promote technology development. The results have shown the country-specific configuration of interacting institutions to promote industrial technological capabilities. Innovation policies need to be linked to the overarching economic goals and adequately supported by specific programmes to remedy market failures (underinvestment in research and development).

1. Introduction

This paper is concerned with the main government programmes in financing innovations using comparative innovation system cases of Malaysia and Thailand. While the concept of National Innovation System (NIS) is mainly applied in industrialised countries, it can be developed and applied in developing economies. The present study uses the NIS model to capture structural characteristics and country-specific policies of the innovation system in Malaysia and Thailand, the emerging tigers of Asian economies. The paper is organised as follows. The second section marshals the theoretical arguments on National Innovation System (NIS) and SMEs and innovation financing. The third section describes an NIS approach methodology of Malaysian and Thai cases. Section 4 analyses the NIS system with a focus on the policies for financing the innovative activities from research and development (R&D) to commercialisation. Section 5 concludes the paper by drawing lessons policy implications which would be useful for policy makers in other developing economies.

2. Theoretical framework

2.1. National innovation system (NIS)

The roots of the innovation system concepts are based on the Schumpeterian economics, emphasising innovation and entrepreneurship [34,35]). Innovation system concept shares the cultural and institutional dimensions which are an unorthodox perspective in the mainstream economic belief. Cross cultural and institutional interactions stressing knowledge and learning constitute a shift of perspective and a new focus. The new focus, which is the core of innovation system, commences from the allocation of given and scarce resources to the creation, distribution and use of new resources.

The concept of the National Innovation System (NIS) or national policies of innovation, particularly in the industrialised countries in the Northern hemisphere, can be traced back to the work of Lundvall at Aalborg University and Chris Freeman in the mid 1980s [8,16,18–20,26]. NIS is the interactive system of institutions, private and public firms, universities and government agencies, aiming at the production, diffusion and exploitation of knowledge within national borders. Interaction can be achieved through both

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market mechanisms and non-market mechanisms such as collaboration and long-term network arrangements [4,20]. The NIS concept is a dynamic tool to investigate, formulate, plan and position the national economic and social development by using technology and innovation as the main driving force (Table 1).

The level of resources devoted by each nation to research and development (R&D) and innovative activities represents a basic characteristic of the NIS [16,25,27]. Determinants of national economic performance and technological capabilities are the size of a country, R&D intensity and market structure [1,8]. The studies of NIS have provided insights into the role of various institutions in the innovation system. University research, research organisations, technology transfer offices, public and private funding organisations are the main elements of NIS whereby linkages and interactions among them are important in shaping the innovation system [6,17].

2.2. SMEs and innovation financing

Small- and medium-sized enterprises (SMEs) have assumed a major influence in the economic development, employment and creation of new innovations [2,10,22,32]. Many economists argue that despite the heavy concentration of R&D expenditure in large firms, it is the small firms that account for most of the important inventions and innovations [9]. However, one of the major constraints facing SMEs is their ability in getting access to funding [7].

Incorporating innovation is a key challenge facing SMEs [38,39]. It is argued that small firms play a major role in innovation and industrial development [9]. Financial and investment policies play an increasing important role in entrepreneurial, venture and economic development [14,15]. The financial and investment policies are among the key operational priorities in developing countries to support investment by local firms, especially SMEs, and transnational corporations investing in these countries.

Rothwell and Zegveld [31], while arguing that small firms play a critical part in innovating, point out the problems of access to finance, ability to cope with government regulations and lack of specialist management expertise. In knowledge-based economies, economic growth is increasingly dependent upon innovation whereby access to finance is seen as a critical factor in this process [3,9,30,42]. Carlsson [4] suggests that public policy should focus on removing obstacles to creativity and on fostering entrepreneurship.

Venture capital (VC) is one of the important technology financing mechanisms assisting research and development activities, from promotion of basic scientific research to technology development and commercialisation. VC is a source of funds that typically finance new and rapidly growing companies through equity participation [3,11–13]. It is a high-risk, potentially high-return investment to support business creation and growth. The concept of modern VC is defined by Megginson [23] as a professionally managed pool of money raised for the purpose of making equity investments in growing private companies with a well defined exit strategy.

VC represents a practical means of linking research to marketable innovations. The technology support and financing system is in line with the NIS framework emphasising the interactive system of institutions, private and public firms, universities and government agencies in support of the production, diffusion and exploitation of knowledge and innovations [16,27,40].

Table 1
Concepts of the National Innovation System.

"The network of institutions in the public- and private-sectors whose activities and interactions initiate, import, modify and diffuse new technologies"
Freeman [8]
"A system of innovation is constituted by elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge"
Lundvall [16]
"A national innovation system is the national institutions, their incentive structures and their competencies, that determine the rate of direction of technological learning (or the volume and composition of change-generating activities) in a country"
Patel and Pavitt [29]
"A national system of innovation is the system of interacting private and public firms (either large or small), universities and government agencies, aiming at the production of Science and Technology within national orders. Interaction among these units may be technical, commercial, legal, social and financial in as much as the goal of the interaction is the development, protection, financing or regulation of new Science and Technology."
Niosi and Bellon [28]
"That set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artifacts which define new technologies."
Metcalfe [24]

3. NIS approach methodology of Malaysian and Thai cases

US Silicon Valley and Boston Route 128 (New England) have become a symbol of technopreneurship that governments around the world are attempting to emulate their success. Silicon Valley and Boston Route Route 128 are successful examples of high-tech economy taking full advantage of the interaction process among the institutions within the regional innovation system [33,41]. However, contrary to the US policy of non-intervention, public policy plays an important role in research and development in developing economies like Malaysia and Thailand.

In the analysis of NIS approach [16,18–20]) as part of innovation development process, the research is undertaken by comparing the policies for innovation financing in Malaysia and Thailand. In other words, the NIS is applied as a qualitative concept for understanding the innovation financing system. In total, 30 public and private organisations were interviewed to gain more specific information about the institutional conditions and linkages within the innovation financing system. The research is focused on innovation financing policies/programmes of the private equity/venture capital financing schemes, R&D tax incentives, loan programmes, capital market regulations and other investment policies. The research were carried out by