

Product and process innovation in Malaysian manufacturing: The role of government, organizational innovation and exports

V G R CHANDRAN GOVINDARAJU, GOPI KRISHNAN VIJAYARAGHAVAN* AND VEERA PANDIYAN[†]

Department of Development Studies, University of Malaya, Kuala Lumpur, Malaysia; *ValueCap Sdn Bhd, Kuala Lumpur, Malaysia; [†]MARA University of Technology, Johor, Malaysia

ABSTRACT: *Using firm level data while controlling firm heterogeneity, we examine the importance of the government's role, organizational innovation and export incidence for product and process innovation. The empirical results show that government incentives, organizational innovation and export are significant in explaining innovative activities among firms. By separating innovation into product and process categories, the empirical evidence reveals that organizational innovation and export incidence are important for both types of innovation while government incentives are significant only for process innovation. Hence, government indirect supports via tax and non-tax incentives such as government technological support is found to have no effect on product innovation suggesting policy redesign to improve the capability of indigenous product development. This study also suggests policy implications for manufacturing firms with regard to sustaining technological upgrading and innovation.*

KEYWORDS: product innovation, process innovation, export intensity, government support, organizational innovation

Innovation is seen as a major drive of economic growth and firms' performance (Chudnovsky, López, & Pupato, 2006; Stock, Greis, & Fischer, 2002). Although the importance of innovation is figured as a vital factor in firms' performances, studies examining the determinants of innovation are still far from complete. A large number of studies focus on the importance of size (Laforet, 2008; Lee & Xia, 2006; Pla-Barber & Alegre, 2007), ownership (Love, Roper, & Du, 2009; Molas-Gallart & Tang, 2006) and the firms' internal resources such as human resource practices and other dynamic capabilities (Chen & Huang, 2009; Leskovar-Spacapan & Bastic, 2007), lacking analysis on the role of institutions (government support), organizational innovation or change and export market expansions or internalization. For instance, Sanidas (2004) contends that the issue of organizational innovation is less explored. More importantly, its effects on technical product and process innovation are not fully documented. In addition, evidence at firm level on the determinants of innovation by distinguishing product and process innovation is still lacking (Mol & Birkinshaw, 2009; Raymond & St-Pierre, 2010), and more so for developing countries like Malaysia. It is important to address this gap in research to provide insights to help policy makers to assess the importance of government incentives as well as internal firm capabilities

e.g., organization innovation/change and export capability. This paper is designed to address a number of interesting questions relevant for developing countries. First, the paper assesses the effectiveness of government supports especially the tax and non-tax incentives (e.g., technical supports) in promoting innovation at firm level. Second, the paper examines the role of a firm's organizational innovation or changes, namely, knowledge management practices and integrated structures and export capability in improving innovative capabilities of firms. This is done by framing the determinants of process and product innovation capability using the firm theory controlling for other firm-specific variables like size and ownership in the context of the Malaysian manufacturing sector.

The selected case study of the Malaysian manufacturing sector is interesting in a number of ways. Malaysia has recorded an impressive performance in the manufacturing sector. The sector contributed 81.6% to gross exports and 31.6% to Malaysia's GDP in 2005. This dramatic economic growth is often attributed to Foreign Direct Investment (FDI). The Plaza Accord in 1985 and the withdrawal of the generalized system of preferential treatment in 1988 boosted FDI inflows to Malaysia. The Investment Act of 1986 further stimulated FDI. This policy provided many incentives, including pioneer status tax holidays, larger

investment tax allowances for expansion projects, tax deductions for export promotions, the establishment of Free Trade Zones and other types of incentives to attract FDI. Malaysia further relaxed restrictions on capital ownership by foreign companies, thus improving FDI in Malaysia in the late 1980s. Malaysia's initial attraction to foreign investors came from its basic infrastructure, political stability, liberal policies and low-wage labor market. However, rapid globalization and other emerging markets such as China and India make these factors less appealing in attracting FDI. Conversely, the sustainability of FDI-led growth may begin to erode due to the new challenges. It is crucial for the Malaysian manufacturing sector to focus on building technological capabilities and innovation to maintain competitiveness. For this reason, the Malaysian government has been emphasizing innovative developments at the firm level as the drive to economic performance (Malaysia, 2010a, 2010b).

Due to the evolution of industrial development in Malaysia (from import substitution to export promotion strategies and from low tech to high tech industries) and the industry's lagging performance at the innovation frontier, the government's role in stimulating technological advancement is critical. Moreover, the high level of uncertainty over R&D returns deters firms from investing in R&D. Stimuli in the form of tax and non-tax incentives are needed to accelerate the pace of innovation by firms. Lall (1996) notes the importance of the government not only in providing the right technological development policies but also in providing fiscal and other incentives for technological progress. These incentives have a major impact on a firm's investment decisions. By creating the necessary economic incentives (tax and non-tax), the Malaysian government plays a pivotal role in spurring innovation by manufacturers. These incentives include tax exemptions for the use of R&D services, construction of industrial buildings for R&D and approved R&D projects (see Li & Imm, 2007 for a detailed summary of R&D incentives). Although, the government has pursued strategies to encourage innovation, studies empirically modeling the role of government are limited. For this reason, we examine the

significance of government support for innovation in this paper.

This paper is organized as follows: The analytical framework and hypothesis section illustrates the analytical and theoretical relevance of each of the explanatory variables in the econometric model. The methodology section discusses the sample, data and variable measurements while the model specification section illustrates the linear model and sensitivity analyses. The results are reported in empirical results section. Discussion and conclusion section provides the policy implications and the conclusion of the study.

AN ANALYTICAL FRAMEWORK AND HYPOTHESIS

Government support

North's (1990) pioneering work on institution¹ has attracted a lot of attention among economists in explaining the growth phenomena. Most studies, referring to institutions as organizations as well as informal rules and norms, examine how these institutional elements shape the behaviors and expectation of firms (Luiz, 2009). Indeed, existing studies emphasize the role of institutions, especially the role of local government in selectively intervening in the market to stimulate local industrial capabilities in very broad perspectives (Lall, 1996; Mathews, 1996; Mathews & Cho, 2000; Moon & Bretschneider, 1997). In a similar vein, the national innovation systems (NIS) literature which takes the systems approach by identifying innovation as a result of an interactive process, also supports the role of government in correcting market failures. Within the NIS framework (Nelson & Winter, 1982a, 1982b), the role of various institutions is highlighted and in particular, with regards to providing basic infrastructure and supports in terms of training, technology acquisition and development and

¹ Institutions encompass four different elements such as rules and regulations, formal organizations or associations, routines within the organization and customs or habits of thoughts (Nelson & Winter, 1982b). In this study, we regard institutions as the policies, i.e., rules of the game implemented by governments to encourage innovative activities. See Luiz (2009) for a detailed review on institution and growth.