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Does Foreign Direct Investment Lead to Productivity Spillovers?
Firm Level Evidence from Indonesia

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Summary. — This paper examines whether spillovers from foreign direct investment (FDI) make any contribution to productivity growth in the Indonesian chemical and pharmaceutical firms using plant-level panel data. The spillover effects from FDI are analyzed using a stochastic frontier approach and productivity growth is decomposed using a generalized Malmquist output-oriented index. The results show positive productivity spillovers from FDI; higher competition is associated with larger spillovers; and domestic firms with R&D gain more spillover benefits compared to those without R&D. FDI spillovers are found to be positive and significant for technological progress and positive, but not significant, for technical and scale efficiency change.

Key words — FDI spillovers, frontier production function, Malmquist index, total factor productivity growth

1. INTRODUCTION

Foreign direct investment (FDI) is believed to provide recipient countries with knowledge transfer as well as capital. The argument is that multinational corporations (MNCs) set up subsidiaries in overseas and transfer knowledge to subsidiaries. The transferred knowledge has a certain level of quality and may spread through non-market mechanisms over the entire economy leading to productivity spillovers in domestic firms (e.g., Caves, 1974; Greenaway, 2004).

Expectation of productivity spillovers from knowledge transfers has been a major impetus to policy makers in many cases to provide FDI-friendly regime. In developing countries, policies in favor of FDI have been introduced in the early 1980s. Since then, net inflows of FDI have increased dramatically and FDI has been the most significant source of private capital inflows to developing countries. From 2001 to 2006, for example, the net FDI inflows to developing countries have increased from US$ 14 billion to US$ 379 billion, more than 25-folds (UNCTAD, 2007). In recent years, FDI inflows have accounted for more than half of total private capital inflows in developing countries (2006). An important question is whether these huge FDI inflows indeed bring about productivity spillovers for recipient countries, particularly for developing economies. The evidence so far is mixed. Some empirical studies confirm positive productivity spillovers from FDI (e.g., Caves, 1974; Chakravorty & Nunnelkamp, 2008; Gorg & Strobl, 2005; Javorcik, Schiff & Wang, 2008), but others find negative or no spillovers (e.g., Aitken & Harrison, 1999; Barry, Gorg, & Strobl, 2005; Djankov & Hoekman, 2000; Haddad & Harrigan, 1993). The mixed evidence intuitively implies that there is no universal relationship between FDI and domestic firms' productivity. Some studies, however, argue that the mixed evidence may be attributed to domestic firms' characteristics and countries' ability to absorb productivity spillovers (e.g., Greenaway, 2004; Smeets, 2008). Nevertheless, different findings depend significantly on research design, methodological approach, types of data used, estimation strategy and even on the construction of the spillover variable.

The present paper extends the current empirical literature to determine whether the FDI leads to productivity gains in the Indonesian chemical and pharmaceutical industries during 1988-2000. These two industries have been chosen as they continuously attracted the highest inflow of annual FDI since 1975 (Table 2). They belong to the group of the most productive sectors in the Indonesian manufacturing industries in terms of value added per worker (around 1.5 times of the manufacturing average), while registering a consistent growth of an annual average of 17.71% during 1988-2000). An overwhelming presence of MNCs in this sector provides a good basis to examine the role of firm-specific characteristics in determining the productivity spillovers.

We estimate FDI productivity spillovers using the Stochastic Frontier Approach (SFA). With this method we also address the importance of competition and firms' absorptive capacity for gaining productivity spillovers. Furthermore, we address the sources of productivity growth in the presence of FDI in these two major industries of the Indonesian economy. A generalized Malmquist index is used to decompose total factor productivity (TFP) growth into technical efficiency change (TEC), technological progress (TP), and scale efficiency change (SEC). We then test the impact of FDI spillover effects on each of these components of productivity growth. The authors know of no other study that addresses the issue of decomposing the productivity effects of FDI using a generalized Malmquist index.

The rest of this paper proceeds as follows: Section 2 provides an overview of the Indonesian manufacturing sector and the inflow of FDI, which is followed by a critical review of the theoretical and empirical studies on productivity spillovers in Section 3. Section 4 discusses estimation techniques followed by data sources and variable construction. Section 6 presents the results for model selection and estimation.

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