

# What Determines Innovation Activity in Chinese State-owned Enterprises? The Role of Foreign Direct Investment

SOURAFEL GIRMA

*University of Nottingham, United Kingdom*

YUNDAN GONG

*Aston Business School, United Kingdom*

and

HOLGER GÖRG\*

*Kiel Institute for the World Economy and University of Kiel, Germany*

**Summary.** — We investigate whether inward foreign direct investment (FDI), either at the firm or industry level, has any impact on product innovation by Chinese state-owned enterprises (SOEs). We use a comprehensive firm-level panel data set of some 20,000 SOEs during 1999–2005. Our results show that foreign capital participation at the firm level is associated with higher innovative activity. Inward FDI in the sector, by contrast, has a negative effect on innovative activity in SOEs on average. However, there is a positive effect of sector-level FDI on SOEs that export, invest in human capital, or undertake R&D.

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## 1. INTRODUCTION

China has undergone dramatic economic changes since it started its economic reforms in 1979. Indeed, it has now emerged as a rapidly growing manufacturing base and exporting country; an issue that has stirred much recent debate in the popular press as well as among academics. The process of opening up the Chinese economy has received a further boost since its accession to the World Trade Organisation (WTO) in 2001.

Economic reforms have had particular implications for Chinese State-owned enterprises (SOEs). From being the by far dominant form of enterprise in pre-reform China, their importance has declined rapidly over the last two decades. For example, as [Bajona and Chu \(2004\)](#) show, the share of output produced by SOEs decreased from 78% in 1978 to 28% in 1999. Also, the SOE sector was shown to have been making net losses since the late 1990s. Still, the welfare of tens of millions of urban workers, the efficiency of the domestic banking sector, and the generation of adequate state revenues all depend to a large extent on the success of SOEs. Given this development, a number of economists argue that without state subsidies, protection, and easy access to bank credits, the majority of SOEs would be on the verge of collapse (e.g., [Lin, Fang, & Zhou, 1998](#)). Hence, reforming SOEs in order to make them efficient to compete successfully on domestic and international markets is of utmost importance for sustained growth of the Chinese economy in particular in the light of the necessary adjustment of domestic policy to WTO rules.

One way of improving efficiency and competitiveness in a firm is through innovative activity.<sup>1</sup> Innovation allows firms to develop new processes to produce existing goods more efficiently or indeed develop new products (or differentiate existing ones) that allows it to expand sales and improve market

performance. These two innovation activities are generally referred to as process and product innovation. Our concern is with the latter, product innovation. Specifically, our research question is to examine the role of firm-level characteristics as well as inward foreign direct investment (FDI) for SOEs innovative activity.<sup>2</sup>

FDI can affect SOEs' activities in two ways. Firstly, directly at the level of the firm through injections of foreign capital, for example, through acquisitions or joint ventures. In this case, our working assumption is that foreign capital participation at the firm level may bring with it transfer of knowledge from the foreign parent company which should stimulate innovation activity. Alternatively, even without knowledge transfer a capital inflow may reduce financial constraints and hence improve innovation. Secondly, FDI at the level of the industry can impact on SOEs innovation activity through potential competitive effects or spillovers. Competition from foreign multinationals can either stimulate domestic innovative activity or the effect can turn out to be negative, similar to the ideas discussed recently by [Aghion, Bloom, Blundell, Griffith, and Howitt \(2005\)](#). Furthermore, knowledge spillovers can have positive effects on innovative activity of SOEs.<sup>3</sup>

To investigate these issues, we use a rich panel data set of some 20,000 state-owned enterprises (SOEs) in manufacturing industries for the period 1999–2005. We estimate an empirical model of SOEs' product innovation activity where we take ex-

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explicit account of endogeneity of regressors and firm heterogeneity, which may affect whether firms benefit from FDI. Our results show that inward FDI at the sector-level impacts negatively on the innovative activity of SOEs, on average. We also find that SOEs with foreign capital participation innovate more than other SOEs. Taking account of firm-level heterogeneity, we find that there is a positive effect of sector-level FDI on SOEs, which are R&D active, engage in labor training, or are exporters.

The remainder of the paper is structured as follows: Section 2 provides a brief overview of the development of inward FDI in China. Section 3 describes the empirical approach, while Section 4 introduces the data set and provides some summary statistics. Econometric results are discussed in Sections 5 and 6 concludes.

## 2. AN OVERVIEW OF FDI IN CHINA

To motivate the empirical analysis, this section provides a brief overview of the trends of FDI flows into China over the past two and half decades.<sup>4</sup> When the Chinese government initiated economic reforms in the late 1970s, FDI was only allowed in four designated special economic zones (SEZs),<sup>5</sup> and foreign investors were required to have local partners. However, by 1986 the government started to implement further policies to attract FDI. Wholly foreign-owned enterprises were allowed for the first time, and export-oriented joint ventures and those employing advanced technology were encouraged through the provision of tax benefits.

As Figure 1 shows, the various policies that are designed to attract FDI appear to have paid off. From nearly zero in 1979, the annual flow of FDI into China reached US\$ 53.51 billion in 2003, leaving China to be ranked top FDI destination worldwide. The surge of FDI after 1992 had been mainly attributed to a wave of new policies of further economic liberalization. Foreign investors were offered better opportunities to sell their products in the domestic market and were allowed to invest into hitherto restricted sectors such as retail trade and finance.<sup>6</sup>

A noteworthy feature of FDI in China is that it is characterized by a very uneven regional distribution. During 1987–2000, about 87% of cumulative FDI was located in the coastal regions (Wei, 2003). This is a reflection of the initial policy that restricted FDI to the coastal regions, and the proximity of these regions to Hong Kong and Taiwan, the main sources of foreign investment, especially at the initial stages of the economic reforms. Although western and central regions (where SOEs have significant presence) have started

to gradually attract more foreign investors, the skewed distribution of FDI in favor of the eastern coastal regions has raised serious concerns that FDI might exacerbate existing regional disparities.

Given the huge potential of the Chinese market, it is perhaps surprising that only few countries are the major sources of inward investment. During 1979–91, Hong Kong accounted for nearly two-thirds of total FDI. Most of the investment from Hong Kong is export-oriented and concentrated in labor intensive sectors. During the same period, the share of Japanese and US FDI was 14% and 10% respectively. During 1992–98, the average share of FDI from the United States has declined to 8% and inward investment from the European Union countries accounted for less than 7% of total FDI. In general, FDI from OECD countries tends to be directed to more capital-intensive sectors and is predominantly motivated by the desire to access the huge domestic market.

## 3. EMPIRICAL APPROACH

Why would one expect the increased influx of FDI to have had any effect on product innovation carried out by state-owned enterprises? Firstly, the influx of foreign capital can alleviate financial constraints in the firm that may hinder innovation. In addition, foreign capital participation in an SOE may bring with it an inflow of technology. After all, in standard models of multinational enterprises (MNEs) they are assumed to have a “superior technology” compared to domestic firms (Markusen, 2002). Hence, a foreign capital inflow through an acquisition, joint venture, or some other form of capital transfer may lead to the installation of the foreign technology in the SOE. Both of these processes could manifest themselves in increasing innovative activity. However, as multinationals generally undertake their innovative activity in the headquarters, large inflows of foreign capital may actually be expected to reduce innovative activity, as these functions may be redirected to the parent company’s home country.

At the level of the industry, the superior knowledge brought into the economy through FDI may leak to domestic firms through, for example, worker movements and imitation, similar to the arguments made in the literature on productivity spillovers (e.g., Görg & Greenaway, 2004). If domestic firms learn the better technology from MNEs, then this may also lead to more innovation activity in the SOEs affected.

In addition to being potential generators of spillovers, multinationals will also affect the competitive landscape in the domestic economy, leading to an increase in competition for domestic firms. It is well known that competition affects

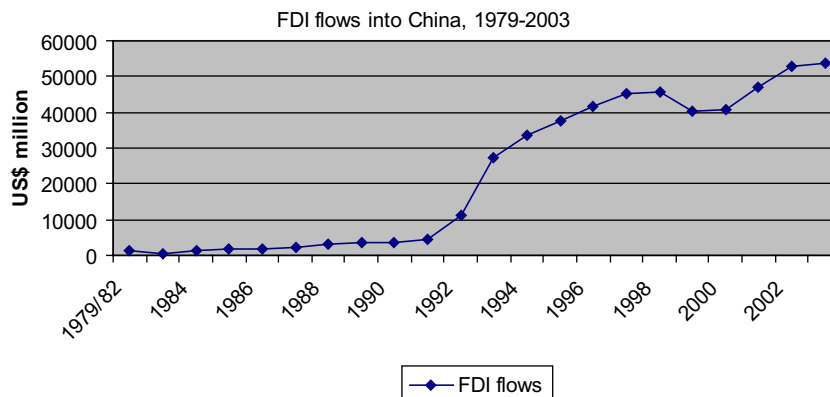


Figure 1. Data Source: China Statistical Yearbook, various issues.

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