



# Economic growth, local industrial development and inter-regional spillovers from foreign direct investment: Evidence from China<sup>☆</sup>

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## ABSTRACT

In many countries inward foreign direct investment (FDI) typically concentrates in a few regions. However, there is little empirical evidence on whether spatially concentrated FDI boosts economic growth in other regions within the same country. We use a dataset that covers 96% of Chinese cities from 1996 to 2004 and find that “inter-regional spillovers” from FDI concentrated in China's coastal cities have a positive and significant effect on the growth of inland cities. In addition, an inland city's industrial development affects its absorptive capacity to gain such inter-regional spillovers from coastal FDI.

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## 1. Introduction

Many developing countries show continuous enthusiasm for attracting foreign direct investment (FDI). Extensive empirical studies using country-level and firm-level data generally confirm that FDI increases economic growth of recipient countries by bringing physical capital, advanced technology, and management expertise (see for example, Borensztein, De Gregorio, and Lee (1998) and Keller and Yeaple (2009)). In many recipient countries, however, FDI is geographically concentrated in a few regions.

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In India, between 2001 and 2005, 65.5% of FDI inflows concentrated in only five of the twenty-five states.<sup>2</sup> A similar pattern appears in Brazil, Indonesia, Lithuania, and Russia.<sup>3</sup> In China, 90% of FDI inflows consistently cluster in the coastal regions that account for 40% of the population and 30% of the land area. This spatial concentration raises the concern that FDI inflows lead to unbalanced regional growth and widen income inequality across regions within an FDI recipient country. This concern is supported by many empirical studies in India (Nunnenkamp & Stracke, 2007) and in China (Fujita & Dapeng, 2001; Jian, Sachs, & Warner, 1996; Lin & Liu, 2000; Ng & Tuan, 2006; Zhang & Zhang, 2003).

However, such concern ignores the inter-regional spillover effects through which FDI concentrated in a few regions may contribute to the economic growth of other regions. If the inter-regional spillover effects of FDI exist and are economically significant, then, such concern is overstated. For many developing countries, the growth effects of spatially concentrated FDI on FDI-scarce regions may determine the desirability of a liberal FDI policy. More importantly, a region's absorptive capacity determines its ability to reap the benefit from inter-regional spillovers, and understanding what affect a region's absorptive capacity may have on policy implications for how a poor, FDI-scarce region can gain from concentrated FDI.

China provides a useful setting for studying inter-regional spillovers. First, China has a large land area and substantial geographic variations in economic activity. China is landlocked on the west and the north, the inland region; coastal regions are mainly on the east and the south. After decades of industrial development under the centrally planned economy, mining and heavy industries are heavily concentrated in inland provinces while most light industries are concentrated in the coast.<sup>4</sup> Second, China also displays apparent FDI spatial concentration and regional income inequality. Coastal regions have geographical advantages for export-oriented FDI (Liu, Wang, & Wei, 2001; Zhang & Felmingham, 2001) and also offer larger domestic markets for foreign firms serving local customers (Amiti & Javorcik, 2008). Furthermore, China's gradual reform policy favored coastal regions by establishing special economic zones and offering preferential tax treatments (Branstetter & Feenstra, 2002). Fig. 1 illustrates the clustering of FDI inflows in China over the period 1996–2004. The most attractive provinces for foreign investors are along the coast. Fig. 2 shows increasing coast-inland disparity in terms of total FDI inflows and FDI per capita, respectively. Coastal provinces enjoy at least 5 times more FDI and 7 times more FDI per capita than inland provinces during the sample years. Fig. 3 provides plots of the standard deviations of FDI inflows and real GDP per capita in the sample and once again reflects the increasing FDI concentration in coastal region and income disparity across China.

FDI concentrated in coastal regions may have boosted economic growth of FDI-scarce, inland regions in China. This paper aims to use the Chinese city level data to quantify the magnitude of such inter-regional spillover effects resulting from FDI concentrated in coastal regions and to test how an inland city's industrial development affects its absorptive capacity to benefit from such inter-regional spillovers. This study is particularly relevant to China since China's regional development policies favor coastal regions to attract FDI and hope the fast coastal growth can drive economic growth in poor inland regions. The analysis of growth effects of coastal FDI on inland cities can shed light on the effectiveness of these policies and on the channels through which inland cities benefit from distant coastal FDI.

We make three contributions to the literature. There is little empirical evidence on the existence and magnitude of inter-regional spillover effects from inward FDI, especially, on inter-regional spillovers from coastal FDI to inland regions. Our first contribution is to test directly inter-regional spillover effects from FDI, specifically, spillover effects from coastal FDI to inland cities, adding new empirical evidence to the sparse literature on interregional spillovers of FDI.

Our second contribution is to test explicitly how local industrial development affects a region's absorptive capacity for inter-regional spillovers. Existing studies on absorptive capacity discuss the roles of human capital, research and development (R&D), and financial markets, but ignore the role of local industrial development. China's inland regions are suppliers of abundant natural resources and intermediate goods to industrial activities in coastal regions. Through such inter-industrial linkages between coastal FDI and inland mining and manufacturing, industrial development enhances an inland region's absorptive capacity for receiving spillovers from coastal FDI. We use the share of mining and manufacturing in GDP to measure an inland city's industrial development. Due to data availability, we discuss but do not focus on the roles of human capital and R&D in determining absorptive capacity.

Finally, we use city level dataset and explicitly address endogeneity issues in estimating inter-regional spillover effects. We assemble a dataset covering 277 Chinese cities during the period 1996–2004.<sup>5</sup> Compared with studies based on Chinese provincial data, city-level data have advantages for studying regional spillovers: (1) A city is the unit of analysis in many economic geography theories (Jones, Li, & Owen, 2003; Neary, 2001). With China's transition to a market economy, more economic policies are made and implemented by city governments. (2) More geographically disaggregated data can reduce measurement error (Cai & Wang, 2003); and the city level data also provides a larger sample size and more variations than does the province level sample (Jones et al., 2003). (3) Empirically, a city panel dataset allows us to control for unobservable city-specific factors that

<sup>2</sup> See Nunnenkamp and Stracke (2007). In 2001–2005, almost 26% of overall approved FDI was located in Maharashtra, followed by Delhi (13.6%), Karnataka (11.3%), Gujarat (8.3%) and Tamil Nadu (6.3%). Aggarwal (2005) and Purfield (2006) provide a similar discussion.

<sup>3</sup> See Blalock and Gertler (2009), Broadman and Recanatini (2001), Javorcik (2004), and Sjöholm (1999).

<sup>4</sup> Two main reasons help explain this industry location pattern. First, at the beginning of its founding in 1949, China feared potential foreign military attacks and, hence, allocated heavy industries in remote inland regions (Gao, 2004). Second, inland regions are endowed with abundant natural resources and have a natural advantage for mining industries.

<sup>5</sup> Mainland China is composed of 31 provincial level administrative districts since 1997, including 22 provinces, 5 autonomous regions, and 4 municipalities. In this paper, all provincial level administrative districts are called "provinces" for simplicity. Prefectural level cities are administrative units under provinces and autonomous regions. A typical prefectural level city is composed of urban and rural areas.

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