When does FDI matter? The roles of local institutions and ethnic origins of FDI

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Abstract

How foreign direct investment (FDI) affects a host environment is a much discussed yet less understood topic of salience for international business managers, policy makers and researchers. Using panel data from 287 Chinese cities over the period 1999–2005, our study assesses (1) the multiple impacts of FDI in both positive and negative domains, (2) the role of local institutional development in moderating these impacts, and (3) whether the moderating effects of institutions differ depending upon the origins of the incoming investment (ethnic- versus non-ethnic-linked). Our analysis shows that indeed, FDI is a double-edged sword: it enhances the host city’s economic growth, labor productivity and innovation but it also causes employment reduction and pollution in host cities. Moreover, the host city’s institutional development is found to enhance the positive impacts of FDI and reduce its negative ones. Interestingly, the moderating effect is smaller for ethnic-linked FDI than for non-ethnic-linked FDI. As the first comprehensive attempt to unravel the role of institutional development in moderating the ambiguous impacts of FDI in multiple domains, this study confirms that a host’s ability to absorb the benefits of FDI while curtailting its associated costs is both plausible and pivotal. As our world becomes flatter and FDI more entrenched in a host’s economic and social development, this study provides important implications.

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1. Introduction

In international business (IB), the research on foreign direct investment (FDI) has generated an extensive body of knowledge about the critical and diverse impacts that FDI may exert on the economic and social development of host countries. Both positive impacts such as impacts on the host countries’ productivity and economic growth and negative impacts such as those on the natural environment have attracted much academic attention. However, findings in this area are often isolated, because few studies have investigated both positive and negative impacts of FDI simultaneously. More importantly, a review of existing literature often leads to inconclusive findings. For example, on productivity spillovers, while studies by Aitken and Harrison (1999) in Venezuela and Kathuria (2000) in India found a negative impact of FDI, Liu (2002) in China and Sinani and Meyer (2004) in Estonia found a positive association. On environment spillovers, the picture

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is even less clear (Meyer, 2004). Both pollution halo (i.e., FDI reduces pollution intensity) and pollution haven (i.e., FDI aggravates pollution intensity) effects of FDI have received empirical support (Antweiler, Copeland, & Taylor, 2001; Copeland & Taylor, 2004; Dasgupta, Laplante, Wang, & Wheeler, 2002). These inconsistencies are concerning because they suggest the lack of a theoretical framework to understand the varying effects of FDI (Caves, 1996; Rodrik, 1999; Wells, 1998). Consequently, our knowledge about how to hedge or reduce the negative FDI impacts while promoting its positive ones is limited, in spite of persistent calls in the existing literature (Caves, 1996; Meyer, 2004; Wells, 1998). Given the importance of the topic, there is indeed a mounting need to advance our understanding about the scale and scope of the impacts of FDI on host-countries with different characteristics (Caves, 1996; Dunning & Lundan, 2008; Eden, 2009; Meyer, 2004; Narula & Dunning, 2000; Rodrik, 1999; Wells, 1998).

In an effort to address the inconsistent findings, we take a new and institution-based perspective to argue that institutional environment significantly varies the degree and even the direction of FDI impacts in the host economy. This institution-based view on FDI is particularly relevant to developing countries where institutions differ significantly from those in developed countries and forcefully shape the way multinationals behave and interact with local sectors (Cantwell, Dunning, & Lundan, 2010; Hoskisson, Eden, Lau, & Wright, 2000; Peng, Wang, & Jiang, 2008). Our study builds on this line of research and aims to make three contributions to the FDI literature. First, our conceptualization is based on the understanding of the institutional mechanism through which host economies absorb and exploit FDI (Borensztein, Gregorio, & Lee, 1998; Cantwell et al., 2010). We argue that local institutions in terms of private property protection, legal and regulatory enforcement, product and intermediary market development, can moderate the various impacts of FDI on the local economy. More specifically, a more developed institutional setting motivates and facilitates both foreign and local firms to compete for output rationalization and curtails the negative impacts of FDI. In contrast, a poorly managed institutional setting may weaken the positive impacts of FDI while strengthening its negative ones. By assessing the role of local institutions in moderating multiple impacts of FDI, our study enriches the institution-based view of FDI and sheds new light on some long debated questions in IB: is FDI always good for the host economy; why do some regions benefit from FDI more than others; and how can government policies make the impacts of FDI more favorable (Dunning & Lundan, 2008; Meyer, 2004; Wells, 1998)?

Second, our study differentiates two types of FDI, those that are ethnic-linked and those that are not, depending on the origin of investment (Dean, Lovely, & Wang, 2009; Wei & Liu, 2006). We examine their differential impacts across different institutional settings. As ethnic-linked FDI normally shares greater similarity with domestic investment and has stronger local embeddedness, its effects are less subject to institutional changes. Thus, we argue that the moderating effects of institutions will be less salient in promoting the positive while reducing the negative impacts of ethnic-linked FDI. In contrast, such moderating effects are much stronger for non-ethnic-linked FDI because of its distinctly superior resource pools and managerial practices. This fine-grained analysis of how institutions interact with FDI of different origins provides implications to guide a more discriminating management of FDI by the host governments.

Third, our study uses Chinese cities as the empirical context because China has always been the top recipient of FDI among developing economies since 1990. More importantly, within the country, there are around 300 major prefecture-level cities with varying institutions all competing for FDI (Qian & Weingast, 1997). Being a regionally decentralized authoritarian system (Xu, 2011), Chinese local governments are responsible for initiating and coordinating reforms, providing public service, enacting and enforcing laws within their jurisdictions, resulting in wide variations in institutional quality across cities and regions. Therefore, it offers us a rich context to empirically investigate the link between institutional development and FDI impacts in one country. We amass data from four sources over 1999–2005, representing the first comprehensive approach to testing the role of institutions in moderating the multiple impacts of FDI. We use two-way fixed models which consider both time- and city-specific effects and the instrumental variables (IV) approach that tackles the problem of endogeneity to minimize potential bias in our results.

2. Conceptual framework and hypotheses development

Stemming from the common belief that FDI generates greater good for host economies, governments of emerging economies such as China give FDI a high priority on their developmental agenda. Often they offer FDI a wide array of incentives – including investment subsidies, lower taxes, duty exemptions, and at times local market access (Meyer & Sinani, 2009). In return, the FDI is expected to contribute to the local economy with positive impacts on technology transfer, management know-how, global market access, and improved industrial competitiveness (Blomström, 1989; Kokko, 1996). FDI is also expected to help reduce income and technology gaps between the host economy and developed countries.

A voluminous literature exists that explores the impacts of FDI on the host’s socio-economic well being (Borensztein et al., 1998; Carikovic & Levine, 2002). Yet, the findings are diverse, and sometimes far from conclusive (Meyer, 2004). In the following, we discuss the theory behind the institution-based view and how the institutional settings change the scale, or even the direction of the impacts of FDI in various socio-economic domains.

3. Institutional development of host economies

There is a growing consensus among researchers that IB studies need to recognize the role of institutions – the “rules of the game” – in shaping MNC activities and the spillover effects they produce (Cantwell et al., 2010; Dunning & Lundan, 2008;
North, 2005). Institutions, broadly defined, consist of informal constraints such as norms, culture, and customs, or the more purposive formal ones embodied in particular political rules and organizational structures. In this study, we focus on formal institutions which encompass the legal framework and its enforcement, private sector development, government intervention, regulatory regimes, and product and intermediary market development (Davies & Walters, 2004; North, 1990, 2005; Peng et al., 2008), as these institutions are enforced constraints for FDI activities and are quantified in the existing literature (Fan, Wang, & Zhu, 2009). In contrast, informal institutions, though playing a significant role in the evolution of the formal ones, emerge spontaneously and remain in the private realm (Williamson, 2000).

China provides an ideal setting to examine within-country variations in these formal institutions. Contrasting past three decades’ unprecedented large scale and rapid growth, China has in general been rated below average on measurements of the application of the rule of law or for governance quality. Such a contrast has been considered among the utmost challenges to the world economy by many Nobel Prize laureates, such as Coase, Maskin, Mirrlees, North, and Stiglitz. Recent intellectual developments in political economy suggest that China’s distinctively different governance structure summarized as the Regionally Decentralized Authoritarian (RDA) system (Xu, 2011) partially explains the institution–economics imbalance. In this regime, local governments are major players in the bulk of the Chinese economy. Under the supervision of the central government, they initiate, negotiate, implement, divert and sometimes resist reforms and policies. They override laws or substitute laws. It is at the sub-national level that these regional governments drive, influence or hamper economic development, environmental conservation or degradation, social stability, etc. To reflect these within-country institutional variations, we define host city institutions to be developed if they support the voluntary exchange underpinning an effective market mechanism. Conversely, we refer to institutions as underdeveloped if they fail to ensure effective markets or even undermine markets.

Empirically, we make use of a NERI index compiled and updated annually by Fan, Wang, and Zhu, the National Economic Research Institute of China (NERI index for short) to proxy institutional development in China. The NERI index is built on 19 components, covering five dimensions of institutional arrangements and policies: (1) government and market relations; (2) economic structure, in particular the growth of the non-state sector and the reform of the state enterprises; (3) inter-regional trade barriers, including price control; (4) factor-market development, including factor mobility; and (5) legal frameworks, including development of intermediate institutions and legal enforcement. It is the most official and comprehensive measure that tracks the changes of institutions in China. Higher scores of the index suggest greater institutional development. The index has been extensively used in economics, finance, and IB studies on China (Chen, Firth, & Xu, 2009; Du, Lu, & Tao, 2008; Gao, Murray, Kotabe, & Lu, 2010; Li, Griffin, Yue, & Zhao, 2011).

Our central tenet is that the development of host institutions enhances the positive impacts of FDI on economic growth, labor productivity, and innovation capacity, while it weakens the negative impacts of FDI on employment and the

![Fig. 1. The conceptual framework of the positive and negative impacts of FDI.](image-url)
environment. We incorporate these five dimensions of impact into our framework because they are some of the most salient outcomes of FDI and the primary focus of interest in the FDI literature. Moreover, our city-level data allows us to examine these five dimensions. Note that this study is not an attempt to review exhaustively the literature on FDI impacts and replicate the findings, which would require multiple articles. Rather, we provide a baseline model that encompasses the multiple impacts of FDI, and apply an institution-based view to reveal the underlying reason behind the variations. Due to a lack of relevant data, FDI impacts on other dimensions such as corruption are beyond the scope of this study. Fig. 1 presents our theoretical framework.

4. The role of institutions in enhancing FDI impacts

FDI contributes to a host environment’s economic growth, commonly measured by the rate of change of GDP, through a number of avenues. In addition to the injection of new investment funds, FDI stimulates a host economy’s growth through the transfer of advanced technology (e.g., Sinani & Meyer, 2004) and human capital (e.g., Carkovic & Levine, 2002), creating the “first-order” effects. Subsequently, second-order effects, including the mobility of these advanced technology, management system, and skilled labor for local firms (Hale & Long, 2006) will follow. This, in turn, enhances the host environment’s ability to absorb other FDI, creating clusters of FDI and pools of talented managers and a skilled labor force in the host economy (Borensztein et al., 1998).

As for labor productivity, which refers to the value-added output per worker (Haskel, Pereira, & Slaughter, 2007), the central postulate is that FDI increases capital investment and improves efficiency in resource allocation, hence augmenting the labor productivity of the host economy. FDI also offers demonstration effects, that is, their superior operational efficiency encourages local firms to place more emphasis on technology investments for productivity gains (Meyer & Sinani, 2009). Previous works have provided support for this positive prediction (Buckley, Clegg, & Wang, 2002, 2007; Liu, Wang, & Wei, 2009).

In comparison, the effects of FDI on innovation gains, defined as the level of patent invention in our study, are less direct, partly due to the proprietary nature and the issue of intellectual property rights in production technologies and accompanying innovations. Yet innovation gains are known to occur through enlarged talent pools and the emergence of a skilled labor force as FDI increases (Lundvall, Johnson, Andersen, & Dalum, 2002; Nelson, 1993). FDI can also benefit innovation activity in the host country via spillover channels such as skilled labor turnovers, demonstration effects, and technological know-how transfer in the host market (Blomström, 1989; Cheung & Lin, 2004; Kokko, 1996).

However, despite the arguments and evidence in support of the positive impacts of FDI, some empirical findings suggest the contrary, mostly because the inflows of FDI may “crowd out” local firms in both resource and product markets (Aitken & Harrison, 1999; Altomonte & Penningts, 2009; Spencer, 2008). By competing in the local resource market which includes land, capital and the labor force, multinational corporations (MNCs) may displace local firms, inhibiting their growth and value creation (De Backer & Sleuwenagen, 2003). As the number of foreign entrants increases, the crowding out effect causes production and operating costs to rise for the local firms (Altomonte & Penningts, 2009). FDI may also crowd out local firms in the product market as they offer superior products with stronger brand names (Kokko, 1996). Some previous research (e.g., Kosova, 2004) argued that these crowding out effects occur in the short-run, and that FDI will produce positive impacts in the long-run, yet this postulate of a delayed effect has not been empirically validated.

We argue that a well-developed institution that has sound regulations and incentives enhances the overall benefits of FDI on the economic growth, labor productivity, and innovation capacity of the host economy. First, where the host environment has more developed institutions, efficient market competition is facilitated. Local firms, unable to rely on preferential treatment from governments, will be more motivated to counter the challenge by raising their own efficiency (Chen, Su, & Tsai, 2007). Both local and foreign firms are encouraged to compete for output rationalization and sustainable advantages when institutions providing sufficient legal protection for market behavior exist (Peng et al., 2008). Under such circumstances, although foreign firms are likely to crowd out inefficient local firms in the initial stage of FDI inflow, local firms will catch up soon after, leading to an overall increase in efficiency (Meyer & Sinani, 2009; Spencer, 2008).

Second, where institutions are more developed, the demonstration effects of foreign firms are stronger (Blomström & Kokko, 2003). The pro-business environment provides transparent regulatory systems, sufficient legal protection and service support, assisting local managers to learn from their foreign counterparts in improving their technology, marketing and management skills (Luo & Peng, 1999). The productivity of local firms will gradually improve due to the enhanced knowledge and skills set (Cohen & Levinthal, 1990).

Third, private property is effectively protected by more developed institutions, which provides foreign and local firms with a fundamental motivation to improve efficiency and market competitiveness (Chen et al., 2007). In an institutionally developed setting, firms will proactively reform organizations, re-engineer business practices, increase employee training, and enhance the technology content of products to maximize their own returns. The assured entitlement to private gains pertains to innovation activities in particular. Where the market malfunctions, foreign investors may constrain their commitment to long-term R&D in the host setting, while local firms may take advantage of weak intellectual property protection to attain knowledge (Khanna & Palepu, 2000). Under such circumstances, the inefficient market competition will reduce both foreign and local firms’ innovation activities. In contrast, where institutions are more established, both local and foreign firms will be more engaged in developing and applying innovations. Foreign firms’ innovation capacity will be more easily realized in new products and processes, and through demonstration and competition, local firms’ innovation will also be enhanced.
Last but not least, institutional development advances entrepreneurial dynamism which prompts FDI’s positive externalities – growth, productivity, and innovation gains. Recent research in business venturing in China has underscored the importance of changes in both formal and informal rule of games in inducing entrepreneurship (Bruton & Ahlstrom, 2003; Kshetri, 2007; Peng, 2004). Formal legal institutions influencing entrepreneurship have gone through “strict prohibition, tolerance, accommodation and encouragement” (Peng, 2004). Society’s attitude toward business also increasingly favors entrepreneurship (Djankov, Roland, Qian, & Zhuravskaya, 2006), especially related to high technologies (Harwit, 2002). However, it would be erroneous to assume the existence of a standard level of institutional development in China. In places where institutions are more developed and market-oriented, such entrepreneur-friendly mechanisms are stronger, facilitating small and medium enterprises to compete with and learn from foreign firms. In contrast, in places where private entrepreneurs lack legal protection, credit support, or social environment, it is less likely for them to grow and develop in the face of fierce competition that FDI brings. Overall, we posit that:

**H1.** Local institutional development enhances the positive impacts of FDI on (a) economic growth, (b) labor productivity, and (c) innovation gains.  

Existing literature on negative impacts of FDI is comparatively thinner than its economic impacts especially for emerging economies (Meyer, 2004). Two streams of literature on the influence of FDI on employment (Jenkins, 2006; Rama, 2003; UNCTAD, 1994) and the natural environment (Antweiler et al., 2001; Dean et al., 2009; He, 2006) have emerged.

Along the employment dimension, FDI can increase local employment directly by creating new “greenfield” plants (Rama, 2003), and indirectly through spurring backward or forward linkages (Ernst, 2005; Liu et al., 2009). These “crowding in” effects may endure if the FDI makes long-term commitments to the host economy. However, evidence abound that FDI also creates “crowding out” effects on employment, which may even outweigh its positive impacts (Jenkins, 2006; Rama, 2003; UNCTAD, 1994). As discussed earlier, FDI may displace local firms, resulting in net job losses for the host economy. Instead of opening new operations and creating new jobs, FDI may acquire local firms, reduce the use of manual labor and switch to automation to meet its superior efficiency. Furthermore, as FDI relocates local supply chains to overseas, employment is further reduced.

The negative net impact of FDI on employment is particularly likely in China. First, as foreign firms enter China, they put competitive pressure on private, collective and state-run local companies. In return, local firms follow their foreign competitors in restructuring and streamlining their staff so as to improve their productivity (Liu, Parker, Vaidya, & Wei, 2001). This demonstration effect combined with the crowding out of inefficient firms has caused total employment to shrink (Wang & Zhang, 2003). Moreover, in terms of industry composition, capital-intensive industries such as manufacturing and services are the favored sectors of FDI. In these industries, the direct positive increase in employment is relatively limited due to a heavy emphasis on automation. According to China Statistical Yearbooks, FDI grew from USD 4.0 billion to 82.8 billion from 1991 to 2002, a growth of 2100%, yet employment created by foreign subsidiaries only rose from 1.65 million to 7.58 million, representing a disproportionately lower increase of 460%.

There are two major theoretical postulates regarding the relationship between FDI and the natural environment. The “pollution halo” hypothesis suggests that FDI transfers modern, environmentally friendly technologies and production processes which improve the poorer environmental standards prevalent in the host economy, leading to reduced pollution in the host country (Antweiler et al., 2001). On the other hand, the “pollution haven” hypothesis suggests that due to the profit-driven nature of FDI, foreign investors are motivated to transfer outdated technologies to places where environmental regulations are less stringent, causing greater pollution to the environment (Leonard, 1988; Low & Yeats, 1992). Empirical evidences on the environmental impact of FDI are mostly anecdotal or cross-sectional, partly due to the lack of pollution data in many countries (Copeland & Taylor, 2004).

In China, we believe that both pollution halo and pollution haven effects exist. As FDI brings advanced technologies and production processes into the country, the overall environmental standards in China should be enhanced. However, the pollution haven effect is equally, if not more, salient, for three reasons. First, as previously discussed, FDI mainly focuses on manufacturing industries, such as transportation machinery, electrical and electronics equipment, textile, and chemical products, which generate much more pollution than the agriculture and services sectors (He, 2006). Second, more importantly, China’s legal institutions for environmental protection are far from rigorous and consistent, which allows the pollution haven effect to prevail. Christmann and Taylor (2001) pointed out that China’s environmental regulations are flexible with wide regional variations. The interpretation and enforcement of the regulations are largely dependent on local governments. For example, when firms emit pollutants beyond official allowable levels, they can get away with it if they have a good relationship with local officials, or they can choose to pay a fine, which is considered more economical by most firms than to invest in ways to structurally reduce pollution. In addition to slack enforcement, variations in environmental standards in different regions also encourage local firms and FDI to move their operations to places where regulations are less stringent. Finally, although FDI may improve the environment through demonstration effects and technology transfers, Dean et al. (2009) have suggested that local firms may very well have little interest in doing the same.

We argue that a more refined understanding about the negative impacts of FDI may be obtained by applying the institution-based view. As discussed previously, the negative impact on employment is largely a result of the crowding out effect where foreign firms displace local ones overriding the crowding in effect where employment opportunities are created by foreign investors. In a more institutionally developed setting where local firms learn and compete more effectively, we believe a balance between the two will emerge, or in a more optimistic situation, the crowding in effect will start to
dominate. The newly created job opportunities by foreign firms will compensate for the loss of jobs resulting from displaced local firms. Furthermore, the market-supporting institutions will facilitate the development of backward and forward linkages for foreign investors (Ernst, 2005), which will spur the clustering of suppliers and customers in the host city, creating more job opportunities.

In addition, the institutional development will also make FDI less threatening to the environment. Where institutions are more developed, the regulatory system of environmental protection is more transparent, consistent, and stringent. Under such circumstances, the pollution halo effect will be more pronounced in that foreign investors will be more motivated to transfer environmentally friendly technologies, raising the environmental standards in the society. Moreover, given a strong institutional setting, the high cost attached to transgressive behavior deters foreign firms from so doing, alleviating the pollution haven effect. Finally, with the development of the host institutions, the services sector will attract more foreign investment compared with the more energy-consuming manufacturing sector. Therefore, we posit that:

H2. Institutional development dampens the negative impacts of FDI on (a) employment and (b) the natural environment of the host setting.

Previous studies have discovered that FDI with different ownership origins tend to exhibit contrasting profiles in terms of spillover effects (Buckley et al., 2007; Dean et al., 2009; Wei & Liu, 2006). In the Chinese context, two types of FDI have been characterized: those that are ethnic-linked (from Hong Kong, Macau and Taiwan) and those that are not (mostly from North America, EU and Japan). While ethnic-linked FDI possesses ownership advantages in the application of standardized and mature technologies, non-ethnic-linked FDI employs state-of-the-art technologies with heavy reliance on R&D to produce innovative and differentiated products (Wei & Liu, 2006). Comparatively, non-ethnic-linked FDI can compete at lower marginal cost through accessing their parents’ ownership advantages such as advanced technologies, managerial skills, and marketing know-how. As a result, they are at a more advantageous position to capitalize on the knowledge gap with local firms (Buckley et al., 2007). In contrast, ethnic-linked FDI may have less experience in mass production, and do not possess the same level of organizational skills as their non-ethnic-linked counterparts. Their demonstration effect to the local economy is comparatively limited because their operations tend to be less technologically advanced (Davies, 1996). Employees from ethnic-linked FDI taking jobs in domestic firms also bring less advanced technologies and management practices than those from non-ethnic-linked FDI.

The distinct nature of these two types of FDI leads us to propose the differentiated moderating effect of institutions. As mentioned previously, ethnic-linked FDI is more similar to local firms in terms of culture, technology, and organizational skills than non-ethnic-linked FDI. In its operations, ethnic-linked FDI also has stronger social embeddedness in the host economy (Gu, Hung, & Tse, 2008). They emphasize on building stronger social ties with government bureaucracies and expanding relational networks (guanxi) in the local context. In a sense, ethnic-linked FDI is more adaptive to different local institutions and their performance is less contingent on changes in the institutional environment (Luo, 2003). Therefore, we argue that host institutions that facilitate the positive and mitigate the negative impacts of FDI are less likely to affect ethnic-linked FDI.

In contrast, FDI from non-ethnic-linked economies possesses superior resources and practices and has less social embeddedness in the host economy (Dean et al., 2009; Wei & Liu, 2006). They have a greater need for market-oriented institutions to protect their intellectual property rights and facilitate their operation. Their impacts on the local economy are also likely to vary in a greater magnitude due to the differing levels of absorptive capability in the host cities. In addition, the local institutions’ role in regulating the negative impacts of FDI is likely to be more effective for non-ethnic-linked FDI because they are less likely to bypass formal regulations through navigating informal networks of guanxi (Gu et al., 2008). Taken together, we posit that:

H3. The moderating effect of institutional development is weaker for ethnic-linked FDI than for non-ethnic-linked FDI in enhancing the positive impacts of the FDI on (a) economic growth, (b) labor productivity, and (c) innovation gains of the host setting.

H4. The moderating effect of institutional development is weaker for ethnic-linked FDI than for non-ethnic-linked FDI in reducing the negative impacts of the FDI on (a) employment and (b) the natural environment of the host setting.

5. Data and methodology

5.1. Database

We test the hypotheses using a panel database compiled from four major sources on 287 Chinese cities over the period of 1999–2005. First, a team including the first author and three research assistants extracts the bulk of city-level data from the Urban Statistical Yearbooks of China, published by the National Bureau of Statistics of China. To minimize missing values, the research team complements this data with statistics from the Provincial Statistical Yearbooks and the China Statistical Yearbooks. Second, the team collects the mass sulfur dioxide emission data of each city from the reports by China’s Environmental Protection Agency. Third, the team obtains each city’s approved patent application data from the Intellectual Property Bureau of China. Finally, the team employs the NERI index by Fan, Wang, and Zhu, and matches
it with our panel data. This multi-source database took one year to compile so that the various impacts of FDI and the moderating role of local institutions can be systematically analyzed.

5.2. Methodology

We follow the standard procedure of previous studies (Buckley et al., 2002; Liu et al., 2001) to construct the econometric model:

$$ Y_{itk} = \beta_1 F_P_{itp} + \beta_2 MKI_{it} + \beta_3 F_P_{itp} \times IST_{it} + X_{itk}\gamma + \alpha_{itk} + \eta_{itk} + \epsilon_{itk} $$

where $Y_{itk}$ is the specific outcome of interest for city $i$ in year $t$, with $k$ representing the five dimensions under consideration in this paper ($k = 1, 2, 3, 4, 5$). $F_P_{itp}$ is the proportion of foreign output to total industrial output in city $i$ for year $t$, with $p$ denoting the total share of FDI, ethnic-FDI and non-ethnic-FDI ($p = 1, 2, 3$ respectively). $IST_{it}$ is the institutional variable measured by the NERI index. All variables in the sample are in real terms and have undergone log transformation to ensure that the coefficients are within the easy-to-interpret range, and to partly solve outlier and heteroskedasticity problems. The key variable of interest is $FP_{itp} \times IST_{it}$, which is the interaction between FDI presence and the institutional development in the city. $X'$ is a vector of control variables. The control variables of each equation depend on different outcome variables. The rationale of including these control variables and their measurements will be discussed later. $\alpha_{itk}$ and $\eta_{itk}$ are sets of time and city dummies that control for the fixed effects of time variations and city variations in the estimation. $\epsilon_{itk}$ is a random error term reflecting omitted variables.

While it is possible to use the ordinary least squares (OLS) model on pooled cross-sectional data, it is not the optimal method because our sample contains repeated city-level observations over time, which give rise to within-city autocorrelation and heteroskedasticity. To avoid the potential problems of OLS, we use the generalized least squares (GLS) regression instead. To choose between fixed-effects and random-effects models, we run Hausman tests for all the models (for results, see Table 3). The results reject the random-effects models’ assumption that the estimated panel error is not correlated with the independent variables. Therefore, we use two-way fixed effects models (Wooldridge, 2002) to control for year- and city-specific effects, which is consistent with previous research on similar topics (e.g. Aitken & Harrison, 1999; Antweiler et al., 2001; Liu et al., 2009).

Furthermore, we consider and address a few econometric problems in our data. First, FDI may be attracted to places with higher economic growth, productivity, innovativeness, and lower employment and environmental standards. Similarly, better developed host economies are likely to have better institutions. These are potential problems that could lead to reverse causality. Second, some determinants of the outcomes of interest that are naturally correlated with FDI and institutions may be omitted. For example, local business culture may affect both the inflow of FDI, institutions, and the socio-economic performance of the city. That is, it is likely that $\text{cov}(FP_{itp} - FP_{itp}, \epsilon_{itk}) \neq 0$ and $\text{cov}(MKI_{it} - MKI_{it}, \epsilon_{itk}) \neq 0$ in fixed-effects models. Third, the measures of FDI presence and institutions may contain errors arising from data reporting and recording processes. For example, as the measures of institutions are constructed ex post, the analysts may have a natural bias in seeing better institutions in richer places. These problems could be solved with instruments for FDI and institutions (Acemoglu, Johnson, & Robinson, 2001). A good instrument would be a variable which is highly correlated with FDI and institutions but not with the error term in these regressions. While employing ideal IVs for our study is difficult, given the topic on FDI and institutions, we have tried to alleviate the problem by using as instruments the one-year lagged values of FDI and one-year lagged values of IST throughout our regressions, following previous studies (Alfaro, Chanda, Kalemi-Ozcan, & Sayek, 2004; Borensztein et al., 1998). The results of the IV estimation yield consistent results with the two-way fixed effects regressions. The robust findings thus go a long way in allaying our concerns on endogeneity and reverse causality.

Finally, we check for potential serial correlation in the residuals using the test developed by Wooldridge (2002: 282-283) for panel data models. To correct for heteroskedasticity, we report the results with robust standard errors to produce valid standard errors (White, 1980).

In the following, we describe the measures of FDI, institutional development, and the control variables. Table 1 provides a summary of the measures for all variables in this study.

5.3. Measures of FDI and institutional development

Overall foreign presence ($FP_{total}$) is measured by the proportion of overall foreign share to each city’s industrial output. Ethnic-linked FDI ($FP_{el}$) is measured by the output share of investments from Hong Kong, Macau, and Taiwan, and

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2 It is customary in the finance and economics literature to use such IVs as legal origin or colonial history. These variables, however, are not useful in our case, because both our dependent variables and FDI are driven by the institutional environment. We look for variables that explain FDI but are less likely to be related to our dependent variables such as economic growth, labor productivity, innovation gains, employment, and natural environment. The literature provides a menu of FDI determinants, but most variables are institutional. Following the evidence provided by previous studies (e.g. Alfaro et al., 2004; Borensztein et al., 1998; Wheeler & Mody, 1992) that FDI is self-reinforcing, i.e. existing stock of foreign investment is a significant determinant of current investment decisions, lagged FDI is used as instrument for FDI (model 1). Likewise, we add lagged score in NERI index as instrument for institutions in Models 2 and 3. The results in Table 3 support our main hypotheses that local institutions strengthen the positive impacts of FDI and reduce its negative ones.
non-ethnic-linked FDI ($\text{FP}_{\text{net}}$) is measured by the output share of foreign investments other than those from Hong Kong, Macau, and Taiwan. These output-based measures help us to avoid the potential pitfalls of using the input of FDI to predict output variables which may generate biased results (Buckley et al., 2007).

Institutional development is measured by the NERI index over 1999–2005, which reflects the sub-national variations in institutional development in China. As described previously, the index consists of 19 components of institutional arrangements and policies, categorized into five dimensions. Sub-indices of the each component were computed using data from the statistical yearbooks, reports from the administration of industry and commerce, survey data, etc. A score for each province was given based on objective measures, such as the ratio of lawyers or the ratio of accountants to the provincial population, and then normalized to a value between 0 and 10 proportionately to measure institutional conditions relative to other provinces. The final index score for each province is the weighted average of the 19 sub-indices, with higher scores indicating a more developed institutional setting. As the institutional development in China is unbalanced across regions and disparate in multiple dimensions, the NERI index is widely used to capture provincial differences in institutional development over time (Chen et al., 2009; Du et al., 2008; Gao et al., 2010; Li et al., 2011).

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3 For detailed calculation of the NERI index, please refer to Fan et al. (2009).
5.4. Measures of dependent and control variables

5.4.1. Economic growth

To examine the impact of FDI on economic growth, we follow the existing literature to compute GDP growth rate (GDPG) as the dependent variable and include initial GDP per capita (LGDPGpc) in our analyses, because it is generally believed that poorer places possess greater potential for economic growth (Stock & Watson, 2003). In addition, we control for the effects of investment rate (INVR) measured by the ratio of fixed investment to GDP, population growth (POPG) which may hamper economic growth given limited resources (Li & Zhang, 2007), labor quality (LQUA) measured by the share of college graduates in the population which is expected to boost economic growth in the city (Borensztein et al., 1998), and government expenditure (GOVEXP) measured by the ratio of budgetary expenditure of local government to GDP, which may negatively affect economic growth (Barro, 1991).

5.4.2. Labor productivity

The value-added industrial output per worker is computed to measure labor productivity (LAPRO). This is in line with Liu et al. (2001) and Buckley et al. (2002, 2007). Our control variables for the equation include capital intensity (CAPINT) in terms of fixed assets per worker, labor quality (LQUA), firm size (FIRSI) in terms of fixed assets per firm, and R&D intensity (RDINT) measured by R&D expenditure per employee.

5.4.3. Innovation gains

We use the number of approved patent applications (PATENT)4 to represent innovation gains in each city. This measure offers some advantages. Previous studies that examined the impact of FDI on innovation tended to use R&D expenditure or return on R&D expenditure as a proxy of innovation outcome (Feinberg & Majumdar, 2001). We consider the number of patents to be a more direct outcome of innovation activities in a society. Also, it includes both product and process innovation (Cheung & Lin, 2004), which cannot be captured by expenditure or sales measures. To separate the effect of FDI from the effects of other variables, we include three control variables following Cheung and Lin (2004): labor quality (LQUA), industrial output (INDOUT), and the ratio of government-led R&D expenses to GDP (RDEXP).

5.4.4. Unemployment rate

We define unemployment (UNEMPL) as the percentage of people in the labor force who are unemployed. The control variables that may affect unemployment include firm size (FIRSI), investment rate (INVR), both of which are positively associated with unemployment because capital and labor are considered substitutes in production, labor wage (WAGE) which may also increase unemployment due to the rising cost of labor, and industrial output (INDOUT) which is likely to decrease unemployment because more labor is needed when the scale of the economy increases (Jenkins, 2006).

5.4.5. Pollution intensity

To measure pollution intensity of a city (SO2INT), we use data of total factory SO2 emission divided by land area (tons/square kilometer), based on the reports by China’s Environmental Protection Agency. Following previous literature (e.g., Antweiler et al., 2001), we control for the effects of capital intensity (CAPINT), population density (POPDEN) which is normally associated with greater pollution intensity, industrial output (INDOUT) which increases SO2 emission due to the scale effect, and GDP per square kilometer (GDPSK) in the analyses.

We report summary statistics including means, standard deviations and correlations of all variables included in the five equations of FDI impacts in Table 2. We further check the variance inflation factors (VIF) for all variables. For the five equations, the mean VIF ranges from 1.43 to 2.87, indicating that multicollinearity is not a serious problem.

6. Empirical results

6.1. Main effects of FDI

We report the results of IV regressions in Table 3. We first run separate analyses on economic growth (GDPG), labor productivity (LAPRO), innovation gains (PATENT), unemployment rate (UNEMPL), and pollution intensity (SO2INT) with relevant control variables and FPtotal to assess the main effects of FDI. The results are displayed under Model 1 in panels A–E, providing a baseline for comparison with subsequent moderated regressions.

The coefficients of FPtotal show statistical significance in panels B and D, but not in panels A, C, and E, suggesting that the presence of FDI has positive influence on the host city’s labor productivity ($\beta = .131, p < .05$), but at the same time, causes unemployment ($\beta = -.238, p < .05$). Although the presence of FDI does not show direct impact on GDPG, PATENT, or SO2INT, its effect transpires through the moderating role of institutions as shown in our later analyses. Taken together, the results reveal that FDI generates both positive and negative impacts, confirming its multifaceted and double-edged effects.

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4 We did consider the Poisson regression for the analysis of PATENT. However, as the Poisson model is mainly used for dependent variables with positive yet low values, it is not suitable for our data, which contains the number of annually approved patents ranging from 6424 to 16,786 for large cities such as Beijing, and from 897 to 2603 for medium cities such as Jinan.
Table 2
Means, standard deviations and correlations.

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Note: N = 2009. Correlations greater than or equal to 0.05 are significant at p < 0.05. All variables are log-transformed.
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<th>A: Dependent variable GDPG</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Hypothesis result</th>
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<td>−0.531*** (0.068)</td>
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<td>IST × FPtotal</td>
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<tr>
<td>LOQUA</td>
<td>0.171*** (0.061)</td>
<td>−0.068 (0.064)</td>
<td>−0.033 (0.068)</td>
<td></td>
</tr>
<tr>
<td>INDOU</td>
<td>0.762*** (0.077)</td>
<td>0.287* (0.077)</td>
<td>0.355*** (0.081)</td>
<td></td>
</tr>
<tr>
<td>FPtotal</td>
<td>0.197 (0.135)</td>
<td>0.097 (0.146)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST</td>
<td>2.653* (0.357)</td>
<td>2.401* (0.371)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST × FPtotal</td>
<td>0.487* (0.128)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model F</td>
<td>83.97***</td>
<td>80.97***</td>
<td>57.54***</td>
<td></td>
</tr>
<tr>
<td>Hausman test/χ²</td>
<td>27.46***</td>
<td>84.43***</td>
<td>75.61***</td>
<td></td>
</tr>
<tr>
<td>D: Dependent variable UNEMPL</td>
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<td></td>
<td>H1c supported</td>
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<tr>
<td>FIRSI</td>
<td>0.147 (0.101)</td>
<td>0.279** (0.126)</td>
<td>0.256* (0.131)</td>
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<tr>
<td>INVIR</td>
<td>0.057 (0.082)</td>
<td>0.178* (0.096)</td>
<td>0.252** (0.097)</td>
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<tr>
<td>WAGE</td>
<td>0.091 (0.115)</td>
<td>0.672* (0.323)</td>
<td>0.514* (0.305)</td>
<td></td>
</tr>
<tr>
<td>INDOU</td>
<td>−0.122*** (0.061)</td>
<td>0.124 (0.125)</td>
<td>0.117 (0.122)</td>
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</tr>
<tr>
<td>FPtotal</td>
<td>0.238*** (0.120)</td>
<td>0.364*** (0.130)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST</td>
<td>−1.882* (0.797)</td>
<td>−1.683* (0.820)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST × FPtotal</td>
<td>−0.084 (0.134)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model F</td>
<td>6.12***</td>
<td>3.74***</td>
<td>3.03***</td>
<td></td>
</tr>
<tr>
<td>Hausman test/χ²</td>
<td>83.51***</td>
<td>65.94***</td>
<td>58.47***</td>
<td></td>
</tr>
<tr>
<td>E: Dependent variable SO2INT</td>
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<td></td>
<td></td>
<td>H2a not supported</td>
</tr>
<tr>
<td>CAIINT</td>
<td>−0.074 (0.092)</td>
<td>−0.098 (0.094)</td>
<td>−0.129 (0.125)</td>
<td></td>
</tr>
<tr>
<td>POPDEN</td>
<td>0.470 (0.312)</td>
<td>0.795*** (0.395)</td>
<td>0.938* (0.425)</td>
<td></td>
</tr>
<tr>
<td>GDPISK</td>
<td>0.150 (0.130)</td>
<td>0.080 (0.150)</td>
<td>−0.009 (0.172)</td>
<td></td>
</tr>
<tr>
<td>FPtotal</td>
<td>−0.133 (0.192)</td>
<td>−0.248 (0.222)</td>
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<td></td>
</tr>
<tr>
<td>IST</td>
<td>1.297 (0.813)</td>
<td>1.711*** (0.743)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IST × FPtotal</td>
<td>−0.420* (0.193)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model F</td>
<td>6.12***</td>
<td>3.74***</td>
<td>3.03***</td>
<td></td>
</tr>
<tr>
<td>Hausman test/χ²</td>
<td>83.51***</td>
<td>65.94***</td>
<td>58.47***</td>
<td></td>
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</tbody>
</table>
Table 3  (Continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Hypothesis result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model F</td>
<td>46.34***</td>
<td>35.19***</td>
<td>23.70**</td>
<td></td>
</tr>
<tr>
<td>Hausman test/$\chi^2$</td>
<td>23.57***</td>
<td>49.20***</td>
<td>60.07***</td>
<td></td>
</tr>
</tbody>
</table>

Note.
1. The total number of observations is 2009, and the total number of groups (cities) is 287. Unstandardized coefficients are reported.
2. Robust standard errors that correct for heteroskedasticity are in parentheses.
3. The Anderson–Hsiao model with IVs is used throughout all models to control for endogeneity. In Model 1, FDI is instrumented by one-year lagged value of FDI. Models 2 and 3 control for the endogeneity problem in both FDI and local institutions by instrumenting FDI with one-year lagged FDI and local institutions with the one-year lagged score of NERI index.
4. Year and city fixed effects are included but not reported.
   * Significance at the 10% level.
   ** Significance at the 5% level.
   *** Significance at the 1% level.

The coefficients of the control variables are mostly significant with expected signs. In panel A, one-year lagged GDPpc negatively affects GDP, confirming the conventional wisdom that poorer places pick up on economic growth more quickly (Borensztein et al., 1998). Both investment rate and labor quality have positive impacts on GDP as expected. Government expenditure as a proportion of GDP shows negative influence, which is also consistent with findings in classic papers (Barro, 1991). In panel B, in addition to the significant impact of FDI, control variables including capital intensity and firm size show positive influence on labor productivity, consistent with previous findings (Buckley et al., 2002; Liu et al., 2001). In panel C, labor quality and industrial output are positively related to the number of patents approved each year. Interestingly, R&D expense by the government (RDEXP) has no significant impact. Combined with the negative effect of government expenditure in panel A, the result suggests the relative inefficiency of the government in boosting economic growth or innovation.

The control variables in panels D and E also show a consistent pattern of results with previous literature. In panel D, industrial output negatively affects unemployment as expected. In panel E, GDP per square kilometer is positively related to SO2 intensity.

6.2. The moderating role of institutional development

The testing of the first two sets of hypotheses (H1a–c and H2a–b) is based on the results reported for Model 2 throughout panels A–E. We include the same sets of control variables as we did for Model 1. In addition, we include two new variables: IST and the interaction term between IST and FPtotal, for each IV regression run. The results in panels A–D show that the institutional development scored in the NERI index significantly strengthens the positive impacts of FDI on economic growth ($\beta = .045, p < .10$), labor productivity ($\beta = .152, p < .01$), and innovation gains ($\beta = .487, p < .01$). A closer look at the effect size of the results indicates that the magnitude of the positive influences of FDI heavily relies on the level of local institutions (Ellis, 2010). One unit of increase in the index leads to a reversal from a negative to a positive FDI influence on economic growth, a 4.5 times greater impact of FDI on labor productivity, and a 6 times greater impact on innovation gains. These statistically and substantively significant results provide strong support to H1a–c, confirming that local institutions play a pivotal role in stimulating and assimilating the positive influences of FDI. In locations where institutional setting is more developed, FDI makes greater contributions to the local economy’s development. However, when host institutions are underdeveloped, the benefits of FDI cannot be effectively captured.

Furthermore, we examine if institutional development also moderates the impacts of FDI on unemployment and pollution intensity (H2a–b). The coefficient of the interaction term in panel D does not reach significance, although the sign is negative as expected ($\beta = -.084, p > .10$). The results in panel E show strong support for the hypothesis that institutional development significantly alleviates the environmental threats that FDI poses to the host city ($\beta = -.420, p < .05$). Taken together, H2 is partially supported. Combined with what we found for H1, the interaction analyses points to a consistent theme: institutions do shape, or even change the course of the impacts of FDI in a host economy. Well developed institutions with transparent governance, efficient resource allocation and flows, consistent legal framework, and matured intermediary markets contribute to the better use of FDI while curtailing its potentially negative effects. To some extent, our findings provide an answer to the hotly debated questions of why and how the impacts of FDI vary across different contexts.

The next two sets of hypotheses (H3a–c and H4a–b) posit that the moderating effect of institutions is weaker for ethnic-linked FDI (FPel) than non-ethnic-linked FDI (FPnet). The results are presented under Model 3 throughout panels A–E.

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5 In Models 2 and 3 of panel B, labor quality shows negative impact on labor productivity ($p < .01$), suggesting a labor-intensive nature of the Chinese economy.
6 In Models 2 and 3 of panel D, control variables including firm size, investment rate, and wage are all positively related to unemployment rate, consistent with our prior expectation.
7 In Models 2 and 3 of panel E, population density shows a positive effect on SO2 intensity, consistent with previous findings and our expectation.
Table 3. We find that IST significantly interacts with FP\textsubscript{net} but not with FP\textsubscript{et} in affecting economic growth (β = .052, p < .05 for FP\textsubscript{net}; β = .001, p > .10 for FP\textsubscript{et}) and innovation gains (β = .352, p < .01 for FP\textsubscript{net}; β = .111, p > .10 for FP\textsubscript{et}), supporting H3a and H3c. Yet, both are significantly related to labor productivity (β = -.109, p < .01 for FP\textsubscript{net}; β = .103, p < .05 for FP\textsubscript{et}) with the Wald test showing no significant difference (χ\textsuperscript{2} = 0.01, p > .10). Therefore, H3b is not supported. Integrating these results, H3 is partially supported in that institutional development has stronger moderating effects on the economic and innovation impacts of non-ethnic-linked FDI, but the moderation is similar for both types of FDI in terms of labor productivity.

Consistent with H4a, results in panel D show that IST significantly reduces the impact of FDI on unemployment if it is from non-ethnic-linked origins (β = -.149, p < .10). However, the interaction between IST and ethnic-linked FDI is not significant, though in the expected direction (β = -.088, p > .10). Finally, H4b is also strongly supported in that institutional development significantly weakens FP\textsubscript{net}’s impact (β = -.271, p < .10) but not that of FP\textsubscript{et} on pollution intensity (β = -.074, p > .10). In all, in terms of the impacts of FDI on unemployment and pollution intensity, the moderating role of institutions is distinct. When stronger institutions are in place, the negative impacts of FDI from ethnically distant countries are effectively reduced. However, FDI from Hong Kong, Macau and Taiwan are less affected by the development of institutions, probably because the investors are able to bypass regulations through their local connections.

7. Discussions and conclusions

7.1. Contributions

As the first comprehensive attempt to investigate the multiple impacts of FDI in an institutional context, this paper makes theoretical, empirical, and methodological contributions to the IB literature. Theoretically, first, amassing panel data from four major sources covering 287 Chinese cities, we validate the double-edged effects of FDI on the local economy. Our results with different city-level outcomes as dependent variables provide consistent support to our argument that FDI exerts significant positive influence on the host city’s economic growth, labor productivity, and innovation gains while posing a threat to employment and the environment. This complements and advances the existing literature which predominantly focuses on individual domains of the impacts of FDI. By assuming a broadened scope, this paper helps to clarify some of the complex influences FDI have on emerging economies.

Second, we construct an institutional framework (Henisz, 2000; Meyer, 2004; Meyer & Sinani, 2009; Peng et al., 2008), to examine the various impacts of FDI in different recipient localities. In their encyclopedic work, Dunning and Lundan (2008) suggest that there has been some progress in understanding the determinants of MNE behavior using an institutional approach, yet, the approach has been less successful to illuminate the effects of MNE activities. This study fills in this gap by focusing on how institutions, particularly formal institutions in an emerging economy, moderate the consequences of FDI. We find that by providing sound regulations and incentives, local institutions boost the host city’s ability to absorb the positive impacts of FDI, and help curtail its potential damage. To a certain extent, this study explains why and how FDI generates dissimilar, sometimes contrasting, impacts across regions from an institutional perspective. As Dunning and Lundan (2008) point out, FDI spillovers arise primarily from linkages formed by particular firms in particular locations. Our study provides empirical evidence of the consequences of the heterogeneity in institutional structures within one country that influence the building of absorptive capability of local firms and upgrading of local economy.8

Third, of particular interest is our finding on the moderating effects of institutions on FDI’s with different ownership origins. While the non-ethnic-linked FDI possesses superior resources and practices, they are less socially embedded in the host economy. In cities with more developed institutions such as stronger support in contract enforcement and property right protection, non-ethnic-linked FDI and FDIs exert both stronger impacts on the positive domains and weaker impacts on the negative domains. In contrast, ethnic-linked FDI is more similar to local firms in terms of culture, technology, and organizational skills. Thus, they are more adaptive to the local environment. Given the institutional similarity, their impacts to local economy are likely to vary to a lesser extent. To manage FDI’s discreetly, policy makers should recognize the discriminating nature, different motives and characteristics behind different kinds of FDI, so as to develop a balanced strategy to effectively control the magnitude of the impacts of FDI across regions.

Empirically, on the basis of a nation-wide NERI index, we tease out how the variance in local institutions influences a host economy’s absorptive capability in dealing with FDI impacts. Complementing the existing literature that investigated the role of institutions at the national level (Antweiler et al., 2001; Kwok & Tadesse, 1996), we capture the disparate, overlapping, and multifaceted development of institutions within an emerging economy, and confirm the effect of such institutional diversity on FDI impact absorption. This fine-grained within-country approach is useful given that many emerging economies are characterized by high contextual variations in institutional development (Hoskisson et al., 2000; Meyer, 2004; Wright, Filatotchev, Hoskisson, & Peng, 2005). Our findings shed new light on how these countries can adjust their policies in accordance to their level of institutional development. To make better use of FDI, policy makers need to first improve institutions such as infrastructures, legal systems, intermediaries, and market development, so as to stimulate and absorb the positive FDI impacts, and at the same time, control, and dampen the negative impacts.

8 We thank one of the reviewers for suggesting this point.
Finally, our attempt also makes three methodological improvements over existing work. First, we use the number of patents approved each year to proxy for innovation activities. This provides an output-based assessment of innovation gains in a host city as compared to the input-based (R&D expenses) or derived (new products sales) measures used in previous studies (Cheung & Lin, 2004). Second, we measure the presence of FDI as foreign output share and use this output measure to predict other economic and social outputs. This helps us to avoid potential pitfalls of using the input of FDI to predict output which may generate biased results arising from potential quality problems of Chinese statistics (Buckley et al., 2007). Third, we employ the IV methodology, using two instruments, lagged values of FDI and institutional development, to alleviate the potential concerns of reverse causality. Fourth, the impacts of FDI on societal domains such as unemployment and the environment have been under-reported in IB research. Our use of city-level panel data allows us to investigate FDI spillovers in the societal domain. Given our finding that FDI does have negative implications for the host city’s employment and the environment, more research is needed to explore the nature and governance mechanisms of the side effects of FDI.

7.2. Limitations and future directions

Our study is limited in a number of ways. First, due to the constraint of data availability, we only have the provincial data on China’s institutional development. If resources allow, researchers may consider conducting surveys to collect views on local institutions in representative cities such as first-tier, second-tier, coastal, and inland cities, to obtain city-level institution measure. Although the NERI index is the most official and widely used index to measure institutions in China, measurement reliability of the index is not available. If a national survey can be conducted to collect data on local institutions, researchers will have greater confidence in the quality of the institution measure and also the analysis results. Moreover, due to the data limitation, we are unable to examine the effects of specific dimensions of the institutional factor such as regulatory, normative and cognitive institutions, which may play differential roles in affecting FDI’s impacts. As the first study to employ an institution-based perspective to study FDI’s environmental externalities, our results suggest a promising direction. We believe future research with more refined data can more fruitfully explore this topic.

Second, the study takes an institutional perspective to examine the ambiguous impacts of FDI in five important areas. However, due to data limitation, we cannot examine other potential impacts such as corruption and income inequality. Future research can advance this study by assessing the interaction between FDI and institutional development on more dimensions.

Third, our data is at the city level; we cannot trace economic gains brought forth by FDI to particular industries within the local economy. Because of that, we are unable to estimate negative societal spillovers such as crowding out effects at the industry or firm level. Indeed, future research along these lines is needed to provide insights into the mediating processes on these micro levels.

Finally, this study focuses on how the moderating role of institutions and the different origins of FDI affect the outcomes. It will be interesting to investigate the linkages among the outcome variables. Simultaneous models could be applied to systematically explore the structural and dynamic process of FDI impacts. For example, the mechanisms through which FDI affects labor productivity, which in turn along with FDI affects the natural environment could be addressed by simultaneous equation models in future research. This may also allow us to study the co-evolution of FDI and institutions in emerging economies as pointed out by Meyer (2004) and Cantwell et al. (2010).

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References


