

## Place, space, and foreign direct investment into peripheral cities

Article (Accepted Version)

McDonald, Conor, Buckley, Peter J, Voss, Hinrich, Cross, Adam R and Chen, Liang (2018) Place, space, and foreign direct investment into peripheral cities. *International Business Review*, 27 (45). pp. 803-813. ISSN 0969-5931

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# **Place, Space, and Foreign Direct Investment into Peripheral Cities**

## **Abstract**

Perspectives drawn from the economic geography literature are increasingly used to generate insights into locational issues in international business. In this paper, we seek to integrate these literatures further by investigating the locational determinants of foreign direct investment (FDI) into peripheral cities within an emerging economy. Peripheral cities in emerging economies are attracting a growing proportion of global FDI flows, but the international business literature lacks a framework for understanding subnational determinants of FDI, particularly into non-core locations. We draw on the core-periphery model to build and test theory on how spatial interdependencies between subnational locations impact on the distribution of FDI inflows into a large and heterogeneous country China. Our results show that whilst peripheral cities tend to have a negative effect on FDI, this effect is positively moderated by proximity to core cities. The results highlight the importance of considering interactions between place and space when investigating locational issues in international business.

**Keywords:** FDI; Cities; Core-periphery; Distance; China

## **1 Introduction**

International business scholars have made concerted efforts to address the neglected role of location in the theory of the MNE (Dunning, 1998) by building on conceptions of location in the economic geography literature (e.g. Blanc-Brude et al., 2014; Monaghan et al., 2014; Wang & Wu, 2016). One of the largest distinctions between the treatment of location in the international business and economic geography literature is the level of analysis at which firm behaviour and the locational determinants of foreign direct investment (FDI) are theorised and investigated (Beugelsdijk et al., 2010). International business research has traditionally been conceptualised at a national level (i.e. considering between country differences). Economic geography, on the other hand, has traditionally investigated firm activity at a subnational level (i.e. considering within country differences). Beugelsdijk and Mudambi (2013) further point out that conceptions of location in economic geography are typically unpacked into place and space. Place encompasses location specific characteristics, whereas space refers to the relative spatial positioning of a particular place. In this study we draw on a further locational feature of the economic geography literature, the core-periphery pattern (Baldwin, 2003; Krugman, 1991, 1998).

Krugman (1991) formalised a core-periphery model to explain how economic activities become concentrated in a small number of locations within countries. The model suggests that in order to generate scale economies whilst minimising transportation costs, firms tend to concentrate their activities in locations with high demand. Overtime, this results in the emergence of a core-periphery pattern, which in its simplest iteration results in a manufacturing core and an agricultural periphery. One of the most observable manifestations of the core-periphery pattern is the increased concentration of populations and economic activities in cities (Krugman, 1998). Cities play a significant role as economic hubs for domestic business activities, but recent research also shows that cities are key locations for

MNEs (Goerzen et al., 2013; Blevins et al., 2016). However, whilst cities can be regarded as core locations relative to agricultural locations, differences across cities can also be understood from a core-periphery perspective (Mans, 2014). For example, capital cities typically differ in character, size and economic power from other cities within the same country (Glaser et al., 2001). This is further accentuated for ‘global cities’ which offer global connectivity and an appreciation of foreignness and foreign firms (Blevins et al., 2016). The rapid pace of urbanisation is creating new opportunities for FDI within countries (McCann & Mudambi, 2005) and, as a consequence, small- and medium-sized cities that are not yet “global” are increasingly seen as important engines of national economic growth. Indeed, non-core urban locations or, “peripheral cities” (Mans, 2014), particularly those in emerging and developing economies, are attracting a growing proportion of global FDI flows (McKinsey, 2011). The key implication of these trends is that now, more than ever before, “*the periphery matters*” (Mans, 2014; emphasis added).

We incorporate the place-space and core-periphery distinctions to build and test theory on the subnational locational determinants of FDI in an attempt to clarify the determinants of FDI into peripheral cities. While research at the sub-national level is growing, Nielsen et al. (2017) highlight that conflicting findings on the determinants are common. FDI plays a critical role in bringing desirable technology, capital, and employment to peripheral cities (Coe et al., 2008; Florida et al., 2012; Tuan & Ng, 2007) but, it is not clear what determines FDI into these locations (McCann & Mudambi, 2005). Rapid economic growth, coupled with lower costs of production (relative to more established alternatives) are key location advantages for peripheral city locations (Mudambi & Santangelo, 2015; McKinsey, 2011). Despite this, existing research suggests that peripheral cities are “unfavourable” locations (Tsui-Auch & Möllering, 2010) that increase foreign investment uncertainty (Mariotti & Piscitello, 1995; Goerzen et al., 2013; He, 2005) and negatively

affect firm performance (Hsu, Chen, & Caskey, 2017; Li & Sun, 2017). Indeed, peripheral cities generally attract less FDI than core cities within the same country (Qiu, 2005). Therefore, the trend toward increasing FDI in peripheral cities raises important and interesting questions concerning the determinants of FDI into seemingly unfavourable subnational locations. Furthermore, given the relative neglect of subnational locations in the international business literature (Beugelsdijk et al., 2010; Dunning, 2008; Nielsen, Asmussen, & Weatherall, 2017), this is an important question for FDI theory more generally. Indeed, McCann & Mudambi (2005: 1862) note that “within individual countries, identifying the conditions under which MNEs will locate in large or small urban cities, in central or peripheral locations [...] is now regarded as essential.”

Existing research shows that FDI at a subnational level is spatially dependent (Blanc-Brude et al., 2014). In other words, the volume of FDI received by a location is dependent on its proximity to other locations. However, it remains unclear how these ‘space’ effects interact with location specific ‘place’ effects. We offer an important extension to existing theory on the locational determinants of FDI by building and testing theory on how ‘place’ effects in peripheral locations interact with geographic distance, or ‘space’, effects in determining the pattern and determinants of FDI within countries. Our study attempts to apply theory to operationalise geographic and core-periphery distances between cities, particularly with respect to the consideration of FDI into peripheral city locations. Our central contention is that distances between core and peripheral locations play an important role in affecting FDI into the periphery. Specifically, we suggest that cities that are geographically remote are less attractive to foreign investors all else remaining equal.

Whilst the focus of this research is on FDI into peripheral locations, our study offers important contributions to understanding the locational determinants of FDI more generally. We affirm existing research that demonstrates the importance of considering both place and

space when investigating the determinants of FDI (Blanc-Brude et al., 2014). However, our core contribution is in showing how space and core-periphery dynamics interact to affect the location choices of foreign investors. In doing so we offer a framework for investigating the subnational locational determinants of FDI. We find that geographic proximity to other cities generally impacts positively on FDI, but this is conditioned on the type of city. Specifically, our results suggest that geographic proximity to other cities generally has no significant impact on FDI into peripheral cities. Instead, we find support for the role of core-periphery space as a determinant of FDI into peripheral cities. We find a positive and statistically significant effect for core-periphery space on FDI into peripheral cities at both regional and national levels. Overall these results suggest that MNEs consider investing in a peripheral city only if and when this city enjoys geographical proximity to a core city.

We follow other subnational studies and have selected China as our empirical context (Nielsen et al., 2017). China is a good testbed for analyzing subnational investment strategies because it is currently pursuing aggressive urbanisation policies (Lin, 2014) and attracting FDI to lagging regions and cities is an integral component of China's economic planning (Fetscherin et al., 2011; Qiu, 2005) which over the years has tried to stimulate investments in particular geographical regions. We differentiate between national core, regional core, and peripheral cities in China using the Chinese government's administrative hierarchy (Canfei, 2006). Our results clearly show the importance of core-periphery proximity for attracting FDI into peripheral cities. Beyond its theoretical implications, this finding has significant implications for the effectiveness of regional catch-up policies in China (e.g., 'Go West'), Europe (e.g., European Regional Development), and elsewhere.

## **2 Theory and Hypotheses Development**

### **2.1 Subnational locations and Foreign Direct Investment**

The FDI location decision is regarded as one of the most important strategic decisions in international business (Aharoni, 1966; Buckley & Casson, 2009; Dunning, 2008). Consequently, there is a large body of literature on the locational determinants of FDI (for reviews see Blonigen, 2005; Kim & Aguilera, 2015; Nielsen et al., 2017). The core thrust behind much of this literature is that FDI is attracted to those locations that are endowed with “location advantages”, such as well-developed markets, industrial density and valuable resources (Dunning, 1988; Verbeke, 2009). However, the IB literature has traditionally focused on FDI location choice at the host country (or national) level (Buckley et al., 2007; Enright, 2009; Galan et al. 2007; Jiang, Holburn & Beamish, 2016; Magnani, Zucchella, & Floriani, 2018). Yeung (2009) regarded this “methodological nationalism” as a key limitation to the advancement of scholarship on the MNE. Indeed, a subnational level of analysis offers a significantly closer approximation of the realities of spatial decision-making within MNEs (Beugelsdijk & Mudambi, 2013; Iammarino & McCann, 2013) and, therefore, arguably represents a better basis for theorising.

A significant body of literature on the relationship between MNEs and locations has treated the concepts of location and country as interchangeable, without discussion of contextual nuances and differentiating factors within and across locations (Beugelsdijk et al., 2010). Indeed, a key aspect of Porter’s (1990, 1994, 1998) influential work on the contingencies between firm strategy and location is the notion that the relevant economic area for a firm is much more localised, and smaller, than the nation (Porter, 1994). The key issue here is that when location choice is analysed at the level of the country, subnational diversity and contextual nuances of the specific locality are aggregated and lost (Chan et al. 2010). This is a significant oversight, especially in the context of widely heterogeneous countries such as the large emerging markets (Meyer & Nguyen, 2005; Tan & Meyer, 2010) and developed economies that exhibit a distinctive economic concentration in a city or region

(Dimitratos et al., 2009; Mudambi & Santangelo, 2015). In essence, between country location choice studies implicitly assume that locational features conditioned at the level of the country are reflected homogeneously across all subnational regions. However, not only is this an unrealistic assumption for any country but city states (Mataloni, 2011; Chan et al., 2010), it also offers only a stylised and highly unspecific account of the spatial decision making of MNEs in practice (Sethi et al., 2011). For example, a particular business function is not located at a country level; rather, it is geographically positioned *within* a country and within country differences are likely to have conditioned where the business function is located (Meyer & Nguyen, 2005). In the following sections we consider how within country variations across core and peripheral locations may impact on the locational determinants of FDI.

## **2.2 The core-periphery pattern**

The core-periphery pattern of economic divergence is one of the most striking features of modern economies (Krugman, 1998). In this study we are concerned with the core-periphery pattern and its implications for FDI across cities. Previous work on the locational determinants of FDI demonstrates the importance of core city locations like capitals and global cities as hubs for FDI (Mariotti & Piscitello, 1995; He, 2005). Core cities accumulate location advantages overtime (Henderson, Shalizi, & Venables, 2005; Krugman, 1991; Scott, 2009), especially in relation to “infrastructures, political and administrative institutions, business services [and] intangible assets relevant to technology and management” (Mariotti & Piscitello, 1995: 818). Recent work affirms this observation by showing that “Global Cities” attract a significant proportion of Japanese outward FDI flows (Goerzen et al., 2013). However, the McKinsey Global Institute (MGI) reports that the economic contribution of the world’s largest 100 cities to global GDP is expected to decline

from 38 per cent in 2007 to 35 per cent by 2025 (MGI, 2011). This forecasted expectation is indicative, not of decline in the global economy, but of the increasing contribution that peripheral cities will make.

Whilst recent research suggests that peripheral cities will play an increasingly important role within global economic processes (Mans, 2014; Kardes, 2016), existing perspectives suggest that they are unfavourable locations for foreign enterprises (Mariotti & Piscitello, 1995; Tsui-Auch & Möllering, 2010; Goerzen et al., 2013) and therefore would attract only low value-adding activities (Toedtling, 1984; Gripaios et al., 1989). The notion that peripheral cities are less favourable locations for MNEs extends to peripheral cities in both advanced (Goerzen et al., 2013) and developing or emerging economies (Chan et al., 2010). However, peripheral cities in emerging and developing economies may present fewer opportunities to foreign investors. Indeed, peripheral locations within emerging and developing economies are typically economically weaker than their non-peripheral counterparts and can often be deprived (Amorós et al., 2013).

As previously mentioned, existing perspectives on FDI suggest that MNEs are attracted to those locations that hold strong location advantages. At a subnational level, location advantages, such as human capital, professional services and government institutions tend to concentrate in major cities (Ma & Delios, 2010). Furthermore, Goerzen et al. (2013) argue that core cities are endowed with advantages such as cosmopolitanism and international connectedness that serve to reduce liabilities of foreignness. However, peripheral locations often lack the type of location advantages that serve to attract MNEs. Firstly, information costs (Casson, 1994) – expenditure associated with developing and acquiring local market information – are likely to be higher in peripheral city locations. In contrast to domestic businesses, foreign firms have less knowledge of, and ability to predict, market conditions and economic events in particular subnational locations. This creates information

asymmetries in comparison to domestic firms. For this reason, foreign investors are more likely to select “country core” locations (e.g. capital cities and major commercial centres) because information is typically easier and less expensive to acquire in core-locations than in the periphery (Mariotti & Piscitello, 1995; Blevins et al., 2016). Primarily, this is because peripheral cities lack the international connectedness and outlook that core cities tend to exhibit (Goerzen et al., 2013). Secondly, peripheral cities are more likely to be characterised by “industrial thinness” (Isaksen, 2015; Tódtling & Trippel, 2005), that is, a low density of industry and organizations. Isaksen (2015: 585) notes that industrial thinness is often a characteristic of regions and cities that are “peripherally located” because they “have low levels of firms clustering and a weak endowment of knowledge generation and diffusion organizations”. Thirdly, networks are likely to be particularly important to operating successfully in peripheral locations. Qiu (2005) investigates FDI in peripheral locations in China, and argues that undeveloped institutional structures in these locations have a negative impact on prospective foreign investors, particularly those who lack existing personal connections in the region. Qiu (2005) concludes that foreign investors are typically too uncertain about their business prospects in peripheral locations to invest. Similarly, Gripiaios et al. (1989) found that high technology investors in the British periphery establish only a few linkages with local firms, which is indicative of a lack of local factor endowments and connections. Therefore, we establish the baseline expectation (BE) that ‘place’ characteristics of peripheral cities typically have a negative impact on FDI.

*BE: There is a negative relationship between peripheral cities and FDI*

### **2.3 Space: the role of distance and proximity on foreign direct investment**

A shortcoming of national level studies of FDI is the emphasis on place over space. Blanc-Brude et al. (2014: 748) note that most studies “treat locations as distinct places, isolated in space, and implicitly assume that distances between one location and another have no impact on the likelihood of FDI”. The distinction between place and space within the conceptualisation of location is well established in the economic geography literature. To clarify, place concerns the specific economic, social and institutional characteristics of a locality (province, city, city district or street), whereas space relates more to explicit notions of distance and proximity (Beugelsdijk et al., 2010). The issue with studies that only consider the impact of place on FDI is the implicit assumption that firms will operate only in the distinct place in which their capital is registered. However, this is more a matter of administrative fiat, rather than operational reality. Whilst the administrative location of the investment may be the primary place of operations, a foreign firm may well conduct formal or informal business activities in neighbouring, administratively distinct, locations. Furthermore, Blanc-Brude et al. (2014) note the important point that location specific characteristics (e.g. foreign agglomerations, human capital) may “spillover” into nearby locations. Therefore, it is likely that, whilst the place specific characteristics of a location play a significant role in influencing FDI, the opportunities presented in neighboring locations will also have a bearing on foreign investors’ decision making. The distinction between place and space within the conceptualisation of location and the separate inclusion of “space” into studies of FDI (and international business more generally) is increasingly seen as important for the theoretical advancement of the field (Beugelsdijk et al., 2010; Beugelsdijk & Mudambi, 2013; McCann & Acz, 2011).

Space is an important source of subnational heterogeneity because it determines the relative spatial positioning of all cities within an economy. We use the terms spatially proximate and remote to describe a city’s relative spatial positioning. Cities that are spatially

proximate are geographically close to other cities. These cities are more likely to be interconnected through economic relationships, commuting and administrative similarities (Blanc-Brude et al., 2014). Indeed, economic and urban geography research has long held that decreased distance between cities is a key enabler of city-growth (Duranton, 1999). Remote cities are those that are geographically distant and thus more isolated from other cities. Remote cities are less likely to trade and engage in commercial activities with other cities, which reduces their overall market size. Furthermore, these cities are more likely to be inward looking because they lack strong relationships with other areas of the country and beyond (Partridge et al., 2008). We suggest that spatially remote cities are less likely to attract FDI than spatially proximate cities. Firstly, the economic logic for investment in a peripheral city that is more remote decreases because there are fewer opportunities to benefit from scale economies, particularly for market seeking firms. Furthermore, remoteness can also negatively impact on the availability of human capital and suppliers (Fujita & Krugman, 2004). Secondly, remote peripheral cities offer fewer opportunities for networking across multiple locations and are, therefore, less likely to be tightly connected, through social and business networks, to other locations within a country (Blonigen et al., 2007). The implication is that social and business networks will be more localised and, for foreign firms, this may create further challenges to successful entry (Tan & Meyer, 2010). Therefore, peripheral cities that are geographically more proximate to other cities are likely to offer more opportunities and less risk to foreign firms. Based on this discussion, our first hypothesis is;

*H1: Geographic proximity to all other cities has a positive impact on the attractiveness of peripheral cities as locations for FDI.*

## 2.4 Core-periphery space and FDI

Whilst general intercity proximity may be important in determining FDI into peripheral cities, we argue that core-periphery proximity is likely to be more important. That is, the space between peripheral and core locations plays a more significant role in impacting on a peripheral location's attractiveness as a FDI host, than general geographic proximity.

We have previously discussed in broad terms the discrepancies between core and peripheral cities, stating that existing perspectives typically note that core locations act as economic and commercial hubs. Here, we delve into some of the more specific differences between core and peripheral cities that foreign investors are likely to be particularly sensitive to. Firstly, the more cosmopolitan nature of core cities compared with those on the periphery arguably increases the acceptance and legitimacy of foreign businesses amongst customers, suppliers, labour, the local government and the general populace (Goerzen et al. 2013). This may augment the ability of foreign firms to develop relationships and secure new business because information, knowledge and resources are shared more freely with foreign firms. Secondly, core cities usually have a larger presence of knowledge intensive business service (KIBS) providers (Herstad & Ebersberger, 2014). Graf (2010) suggests that, for foreign firms, KIBS providers act as "gatekeepers" to the local economy. In essence, KIBS providers have already cultivated networks within particular locations and foreign firms can utilize these networks to facilitate learning and to identify customers, suppliers and business opportunities. Thirdly, core cities have greater connectivity with both national and international communication networks. As noted by Mariotti and Piscitello (1995: 818) "Thanks to their sophisticated communications networks, [core] areas absorb information from and transmit it to outside centres much more effectively than those areas lacking a supranational orientation." These communication networks may enable firms to learn more about local conditions and market developments, thus, enabling them to gain greater access to

‘insider’ information (Tan & Meyer, 2011). Finally, core cities have important political and administrative functions and responsibilities (Ma et al., 2013). Firms located in these cities, therefore, have greater potential to develop important political connections, which can be used to exert influence and to ease market relationships (Wright et al., 2005; Peng & Luo, 2000). Therefore, the characteristics of core cities described above may help to facilitate foreign firms’ entry and establishment in a country.

In combination we suggest that the cosmopolitanism, greater presence of KIBS, advanced and outward looking communication networks and administrative responsibilities engender an environment that is less risky for foreign investors. Extending the argument above regarding the role of space and proximity as a determinant of FDI, we suggest that the space between peripheral and core locations plays an important role in their attractiveness to foreign investors. This core-periphery space effectively provides a means through which firms in peripheral cities can benefit from the advantages of core cities, despite not holding physical assets in one of these cities. Additionally, we suggest that peripheral cities that are in close proximity to core cities may adopt their characteristics through spillover effects. Indeed, Blanc-Brude’s (2014) research on spatial dependence in locational data relies on Tobler’s (1970: 7) observation that “near things are more related than distant” things. Hence;

*H2: Geographic proximity to core cities has a positive impact on the attractiveness of peripheral cities as locations for FDI.*

### **3 Data and methodology**

#### **3.1 Research context**

The empirical context for this research is the People’s Republic of China (herein China). China is a suitable context for this research for two main reasons. Firstly, since 2005

China has been a leading destination for FDI (UNCTAD, 2014), making it an important context in which to examine the subnational determinants of FDI. Secondly, China is a rapidly urbanising, large, and heterogeneous emerging economy. Iammarino and McCann (2013: 341) note that, “some 350 million people will be added to China’s urban population by 2025”. Iammarino and McCann (2013: 341) further note that “investment patterns within China will also evolve over the coming decades in ways which will probably be rather different from the inward FDI patterns since the late 1980s, which tended to be heavily focused only on the mega-cities”. Therefore, China provides a relevant context in which to examine the locational determinants of FDI at the city-level.

### **3.2 Data sources**

We collected and combined secondary data from two sources: (1) Chinese National Bureau of Statistics (CNBS) and (2) World Bank China Enterprise Survey data (2006). CNBS data have been used widely in studies of inward FDI in China (e.g. Amiti & Javorcik, 2008). We complement this data with additional “investment climate” data collected by the World Bank. In 2006 the World Bank published a report on government effectiveness, social-development and the investment climate across China’s cities. The report surveyed 12,400 foreign and domestic businesses across 120 cities and is thus one of the few sources of comprehensive data on subnational differences in China (Weiss, 2008)<sup>1</sup>. This data is self-reported by firms and aggregated at the city level with mean values taken as representative of local conditions. Similar self-reported measures for location data have been used in previous studies on location choice (Tan & Meyer, 2011). We match the CNBS city data with the city data included in the World Bank report. The purpose of matching and integrating this data is

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<sup>1</sup> For a city to be included in the report it had to receive more than 100 responses from surveyed in the location.

to include important institutional and productivity control factors into our models. Additionally, using the World Bank city sample allows us to better control for city attractiveness, because the sample frame for the World Bank survey required cities to have a significant presence of foreign firms already. Data from both the World Bank survey and the CNBSs are aggregated at the city-prefecture level and are, therefore, comparable across both sources. The final data set includes 118 cities and is a four-year (2006-2009) balanced panel. We lagged all independent variables by one year.

### **3.3 Dependent variable and independent variables**

Our dependent variable is the *FDI received* by city  $i$  at time  $t$  as a percentage of its GDP. FDI received is a popular measure for investigating the locational determinants of foreign investment (e.g. Wei, Liu, Parker, & Vaidya, 1999; Du, Lu, & Tao, 1998) because it captures the total volume of FDI that is received by a city. Following Blanc-Brude et al. (2014), we adjust our measure by expressing it as a percentage of GDP to control for heteroskedastic errors derived from city-scale. Thus, our measure of FDI allows for like-for-like comparisons of FDI across cities because it controls for city-size and economic power.

Our baseline expectation as well as H1 and H2 requires us to make a distinction between core and peripheral cities. To do so, we construct a three-tier subnational urban hierarchy for China which is based on the Chinese government's administrative hierarchy (Canfei, 2006). The three-tier categorization is composed of:

- (1) National Core Cities (NCCs): Centrally controlled municipalities (Beijing, Tianjin, Shanghai and Chongqing) and the major economic hub of southern China, Guangzhou.
- (2) Regional Core Cities (RCCs): Sub-provincial cities and provincial capital cities and;

(3) Peripheral Cities (all other prefecture level cities).

Recognising two-tiers of “core” cities is important for a country as large and diverse as China. For example, having classed the NCCs as cores, it would be inaccurate to regard large Chinese cities such as Shenzhen, Wuhan, Ningbo or Chengdu as peripheral, considering the size and economic output of provincial capital cities in China (Florida, 2008).

Additionally, sub-provincial cities and provincial capital cities are differentiated from other prefecture-level cities in China through their special administrative responsibilities and greater level of decision making autonomy (Canfei, 2006). In this sense, these cities act as regional economic and administrative hubs. By default all other cities are regarded as peripheral, which reflects their smaller economic size and lower levels of administrative responsibility in comparison with other Chinese cities. These distinctions are captured by dummy variables.

We construct a measure of proximity using the density approach developed in Sorenson & Audia (2000). This measure captures how proximate a city is to all other cities in the sample and, therefore, its relative spatial positioning. This measure effectively allows us to capture space effects for each city in the sample. Formally, proximity is calculated as

$$GP_{it} = \sum_j \frac{x_j}{(1 + d_{ij})^t}$$

Where  $x_j$  is a weight,  $d_{ij}$  is the distance between city  $i$  and city  $j$ ,  $t$  is the time index and  $j$  is an index for all cities other than  $i$ . This measure represents the distance between city  $i$  and all other cities in the sample at time  $t$ . It should be noted that whilst this is a density approach it is a popular method for measuring distance and proximity (e.g. Funk, 2014; Stuart &

Sorenson, 2003). We consider two different weights for  $x$ . Sorenson and Audia (2000) use a vector of ones as the  $x_j$  weighting, thereby capturing geographic proximity amongst  $i$  and  $j$ . However, Blanc-Brude et al. (2014) argue that economic proximity may be more important than geographic proximity in influencing FDI location decisions. In other words, proximity to those cities that are economically attractive will be more important than proximity to those that are not. To control for this, we set the weighting parameter,  $x_j$ , to the log of GDP of city  $j$  at time  $t$ . We computed the distance parameter,  $d_{ij}$ , by discerning the latitude and longitude of each city. We then calculated  $d_{ij}$  in Euclidean distance, following Sorenson and Audia (2000), as

$$d_{ij} = \alpha \{ \arccos[\sin(lat_i) \sin(lat_j) + \cos(lat_i) \cos(lat_j) \cos(|long_i - long_j|)] \},$$

Where  $d_{ij}$  is the distance between cities  $i$  and  $j$ ;  $\alpha$  is a constant, set to 343.78, thereby providing the result in ten mile units, and latitude ( $lat$ ) and longitude ( $long$ ) are measured in radians. To test H1 we examine the interaction between peripheral cities and geographic proximity. This interaction effectively represents the geographic proximity between peripheral city  $i$  and all other peripheral and core cities  $j$  in the sample. Put differently, for any peripheral city we capture its geographic proximity to other economically attractive cities.

To capture the interaction between periphery-core proximity and FDI, we measure the distance between peripheral and core cities as

$$PCP_{pt} = \sum_c \frac{x_c}{(1 + d_{pc})'}$$

Where  $x_c$  is a weight,  $d_{pc}$  is the distance between peripheral city  $p$  and core city  $c$ ,  $t$  is the time index and  $c$  is an index for all core cities. Effectively, this equation is an amendment of the geographic proximity measure, but rather than measuring distance between city  $i$  and all other cities  $j$ , it specifically measures the distance between peripheral city  $p$  and all other core cities  $c$ . Therefore, this measure specifically examines the geographic proximity between peripheral and core cities.

Given that our theoretical framework emphasizes both place and space effects, we control for some important place-specific (city-level) characteristics. Firstly, we attempt to control for institutional conditions by including a measure of *government effectiveness* at the city level. Previous research has highlighted the importance of local government as a determinant of FDI in emerging economies (Du et al. 2008; Ma, Delios, & Lau, 2013). Government effectiveness is measured by using a composite variable created by the World Bank. It includes; (i) taxes and fees as a percentage of sales – providing an indication of the value of government services; (ii) ‘entertainment costs’ for government officials – providing an indication of government professionalism; (iii) the average number of days required to clear imports and exports – providing an indication of the efficiency of a specific government service and (iv) the time-cost (total number of days per year) spent dealing with four bureaucracies (tax administration, public security, environmental protection and labour and social security). Secondly, we attempt to directly control for cities’ “location advantages” using the aggregate *total factor productivity* (TFP) of local foreign and domestic firms (Di Giacinto et al., 2013). The TFP calculation provides the “residual productivity output after netting out the effects of capital and labour” (World Bank, 2006: 95) and is an evaluation of the performance of firms in terms of their proficiency at converting inputs into valuable outputs (Javorcik, 2004). The World Bank calculates how each city’s “investment climate” impacts on the total factor productivity (TFP) of firms, by estimating the impact of a city’s

number of employees, population size and GDP per capita on TFP. In essence, this measure provides an indication of a cities' capacity to impact on firms' productivity, which we take as an indicator for location advantages. Both government efficiency and TFP are time invariant in our data. The World Bank report was published in 2006 and our dataset covers 2005-2008. Therefore, it is likely that the government efficiency and TFP data adequately represent conditions over this period. Thirdly, we control for *GDP per capita*, the log of *population size*, and *foreign agglomeration* using data collected from the CNBS. Previous studies indicate that these location specific attributes play an important role in affecting the subnational distribution of FDI (Wei et al., 1999; Du et al., 2009). In addition, we use total freight traffic to measure a city's *logistics* development, the log of total road network to proxy for local *infrastructure*, and the log of sulphur dioxide (SO<sub>2</sub>) emission to capture the intensity of *industrial activity*. Finally, we construct a dummy variable to capture cities that are located in the more developed and outward facing coastal regions of China (Chadee et al., 2003; Wei et al., 1999).

We analyse our data using generalised least squares (GLS) with random effects (RE) (Li & Park, 2006). GLS is used to estimate linear regression models and is particularly suited to data where autocorrelation may be present, such as in spatial data (Engle, 1982). Given the heterogeneity across the cities that comprise our data a RE effects model is theoretically more suited for the analysis (Blanc-Brude et al., 2014) - confirmed by a Hausman test ( $p = 0.975$ ). In addition, RE is a suitable model to use when time invariant data is expected to have an impact on the dependent variable as is the case in this study (Stock & Watson, 2006). Correlations and descriptive statistics for all variables can be seen in Table 1.

**\*\*\* INSERT TABLE 1 ABOUT HERE \*\*\***

## 4 Findings

Table 2 reports our main results. Model 1 estimates the relationship between peripheral cities and FDI. Model 2 estimates the interaction between peripheral cities and geographic proximity on FDI. Model 3 estimates the relationship between periphery-core proximity and FDI.

**\*\*\* INSERT TABLE 2 ABOUT HERE \*\*\***

Regarding place-specific control variables, we find that foreign firms are drawn to location advantages in that a city's total factor productivity is positively and significantly related to FDI. Similarly, foreign agglomeration has a positive impact on FDI. We also find that the level of logistics development around the space attracts foreign investment. To our surprise, infrastructure and industrial activity negatively impact on FDI. All these results are robust across the three models.

Our BE is corroborated in Model 1 and Model 3 with a consistently negative and statistically significant relationship between peripheral cities and FDI inflows. The coefficient is negative in Model 2 but insignificant ( $p=0.133$ ). Geographic proximity is consistently positive and statistically significant in Models 1 and 3, which indicates the importance of geographic space as a determinant of FDI flows. The coefficient is positive but insignificant ( $p=0.198$ ) in Model 2. We test H1 in model 2 by creating an interaction term for peripheral cities and geographic proximity. Despite a positive coefficient, the effect is statistically insignificant ( $p=0.598$ ), indicating that proximity to other cities does not positively impact on FDI into peripheral cities. Therefore, although geographic proximity has a positive impact on FDI into cities generally, the effect does not impact on FDI into peripheral cities specifically. Therefore, we reject H1. Model 3 tests the relationship between periphery-core proximity and FDI. It shows a positive and statistically significant effect of periphery-core proximity on FDI into peripheral cities. This corroborates H2, which argues

that FDI will be more attracted to peripheral cities that are geographically closer to core cities.

#### **4.1 Post-hoc analysis and robustness check**

To inquire the sensitivity of our results, we modify periphery-core proximity to create measurements of periphery-NCC distance and periphery-RCC distance<sup>2</sup>. In Table 3, Models 4 and 5 examine the relation of periphery-RCC and periphery-NCC proximity with FDI, respectively. We find that the effect of periphery-NCC proximity is insignificant, whilst periphery-RCC proximity exerts a positive and statistically significant impact. This partly supports H2 and suggests that the significant association between periphery-core proximity and FDI is driven by peripheral cities' geographic proximity to core cities at the regional level. In other words, the easier access to sub-provincial and provincial capital cities is more important than that to national economic hubs for peripheral cities in attracting foreign capital.

Moreover, we make efforts to understand the interconnections between peripheral cities, industrial activities and FDI. We ask whether the FDI attracted to peripheral cities is drawn to industrial activities vis-à-vis the service sector. Model 6 in Table 3 includes an interaction term for peripheral cities and industrial activity. It shows a positive and statistically significant effect, and suggests that the intensity of industrial activities in a peripheral city increase its attractiveness to foreign investors. This is in contrast to a negative and significant direct effect of industrial activity. Our interpretation is that, while FDI does not tend to be co-located with manufacturing plants in general, being an industrial cluster does help to offset the disadvantage of peripheral cities. We also note that, although H1 is

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<sup>2</sup> We also created measures of distance to the nearest core city, with similar results to those reported.

unsupported, our measure for geographic proximity is highly significant across the models in Table 3. This lends support to the importance of including spatial factors in models of FDI.

**\*\*\* INSERT TABLE 3 ABOUT HERE \*\*\***

Lastly, we run four additional models to test the above relationships over a longer time frame (see Table 4). To do so, we drop two variables that are time-invariant (Government effectiveness and TFP). These models cover FDI inflows across the ten-year period 2001-2010. These models validate both the baseline expectation and hypothesis 2, thereby confirming the previous results and showing that the effects of distance and proximity are robust over a longer time period than the four-year period considered in the main specification. The effects of peripheral cities and geographic proximity are more consistent and robust in this sample. Moreover, we also find support for the interaction between peripheral cities and industrial activity, suggesting that there might be a systematic pattern as to what kind of FDI – in terms of sectoral characteristic and investment motivation – is drawn to peripheral cities.

**\*\*\* INSERT TABLE 4 ABOUT HERE \*\*\***

## **5 Discussion**

The ongoing and interrelated processes of globalisation and urbanisation continue to redefine the geographic boundaries and possibilities for international business activities (Meyer et al., 2011). These processes also highlight the limitations of existing international business theory (Beugelsdijk & Mudambi, 2013). One area in which this is particularly true is in explaining the locational determinants of FDI in peripheral locations, especially those that reside within emerging and developing economies. While this research focuses its interests on peripheral cities, the study offers insights that extend FDI and location theory more

generally. In particular, we answer the call of McCann & Mudambi (2005) and Nielsen et al., (2017) to form a better understanding of the determinants of FDI at the subnational level, and in peripheral and core locations in particular. We extend existing perspectives on the locational determinants of FDI by investigating how place-space and core-periphery distinctions impact on FDI into peripheral city locations. Whilst this study has focused on peripheral locations, its core contribution is in providing a lens through which IB scholars can begin to think about and investigate locational issues within and across countries.

In line with our baseline expectation, foreign investors tend to avoid peripheral cities. This reflects existing thought on the core-periphery pattern, which suggests peripheral locations tend to be unfavourable, deprived, and lacking in international connectedness (Amorós et al., 2013; Mariotti & Piscitello, 1995). However, despite this negative effect a substantial proportion of FDI flows into China are received by peripheral city locations. The question we are thus most interested in is, what determines FDI into peripheral cities.

Our theory suggested that FDI would be more likely in peripheral cities that are in close proximity to other cities and, in particular, to core cities. In other words, we theorise that foreign investors would prefer those cities that are less geographically remote. Whilst we find a positive and significant effect for intercity proximity across all cities, we find that the effect for peripheral cities is not statistically significant. The positive effect for geographic proximity across all cities corroborates the assertion that spatial proximities impact on FDI generally (Blanc-Brude et al., 2014), but shows this to be more nuanced. Specifically, our results suggest that there is a *place* dimension to *space* effects. These results suggest that proximity to *all* cities does little to improve the attractiveness of a peripheral city. This may be because proximity with other peripheral cities is not sufficient to overcome the challenges of operating in a peripheral location. Indeed, our theorizing suggests that spatial proximity to other locations increases the scale and scope of economic opportunities available to a firm

because of the complementary industrial specialization of each city. But, spatial proximity to other locations that have a weak business environment is unlikely to create such opportunities. In this sense, for peripheral cities, the type of location that they are proximate to is likely to influence foreign investors more than their general spatial positioning.

As anticipated, the core-periphery dynamic is a particularly important consideration when investigating FDI into peripheral locations. Previous work suggests that core cities reduce foreign investment risks and uncertainties through their better developed location advantages (e.g. Mariotti & Piscitello, 1995; He, 2005). We extend this by arguing that foreign firms can benefit from the advantages of core cities without having to directly invest in these locations. Indeed, given that core locations can generate negative externalities, such as pollution, congestion, crime, and high costs of living (Krugman, 1998), the option to locate near to, but not in, a core city may be an attractive option for some foreign investors and contribute to their performance (Hsu et al., 2017). Our results show that a peripheral city's proximity to core cities has a positive and statistically significant impact on FDI.

Furthermore, we test this hypothesis for both regional core cities and national core cities and find that in particular regional cores are relevant. We suggest, therefore, that foreign investment into peripheral locations is interdependent with their spatial relationship to core cities. This finding is important and interesting considering that we find little statistical support for proximity to *all* other cities. It demonstrates that considering the core-periphery pattern is important for investigating locational issues in IB.

Our results contribute to the IB literature by providing a general framework that can be used as a lens through which to investigate subnational locational determinants of FDI. Specifically, we theorize and provide empirical proxies to capture the impact of place-space and core-periphery distinctions on the location decisions taken by foreign investors. As noted in the preceding section, our results clearly demonstrate the importance of considering the

wider spatial environment and the prevailing economic pattern of a country's subnational locations. However, our results show that interactions between place and space need to be considered. Clearly, the core-periphery model provides a useful set of concepts for thinking about how economic disparities within countries impact on the determinants and distribution of foreign investment. However, the core-periphery model also opens up new possibilities for examining the relatively neglected role of peripheral cities within international business. Central to this study is the idea that the distances between, and the spatial positioning of, subnational locations creates locational interdependencies that are reflected in the preferences of foreign investors. Specifically, we assert that firms can exploit economic opportunities in locations which are proximate to their FDI location. This reflects on Krugman's (1991) notion that distances erode economic opportunities through the creation of transport costs. Additionally, in line with Tobler's (1970) assertion that proximate locations are more related than distant locations, we suggest that close proximity to core locations affords not only heightened economic opportunities associated with core locations, but also leads peripheral cities to adopt characteristics of core locations, such as cosmopolitanism (Goerzen et al. 2013). This in turn makes peripheral cities that are in close proximity to core cities more attractive to foreign investors than those that are highly distant from core cities.

### **5.1 Implications for future research**

This study, like all, suffers from limitations, which suggest several directions for future research. Firstly, our aggregated measure of FDI does not allow us to directly capture the impact of firm- and industry-specific factors on determining foreign investor location preferences. It is likely that the relative importance of subnational place and space factors will vary depending on the nature of the business activities that a firm intends to conduct (Enright, 2009; Lei & Chen, 2011). Our findings suggest though a relationship between the

peripheral city and industrial activity. Future research should attempt to investigate how investment motivations (i.e. market seeking vs efficiency seeking) impact on where firms locate (e.g. core or periphery) and how important space is in affecting the location of the business activity. A further firm-specific factor that can impact on location choice is the stage of the investment (Ma, Tong, & Fitza, 2013). For example, first-time entrants to a country may be biased toward investment in core cities, given their lack of knowledge about local-contexts and the business environment. A firm's country-of-origin relative to the host nation may also affect its subnational locational preferences. For example, FDI from culturally similar countries may be more likely in peripheral cities than FDI from culturally distant countries (e.g., investments by Vietnamese firms in bordering Southwest China). Relatedly, it is likely that the industry of the firm will impact on sensitivities to core-periphery patterns and space. For example, if an industry is agglomerated in a particular city, new prospective entrants will seek to locate within this cluster (Belderbos et al., 2011) or nearby. These considerations support the call for a more integrated perspective on location choice which considers regional, national, and subnational factors (Nielsen et al., 2017). Likewise, research that combines firm-specific data with location-specific data will help us to form a better understanding of the complex trade-offs and interactions involved when selecting subnational locations. Secondly, our research is limited by the fact that it is a single country study. Future research is needed to determine the generalisability of these results to other contexts. A pertinent question here is whether the impact of proximity to core cities on FDI matters to the same degree in advanced economies. With the increasing importance and relevance of peripheral cities (Mans, 2014), it is important for IB scholars to develop a better understanding of these locations as destinations for foreign investment. Finally, future research should look at peripheral cities in a global context. "Global cities" are connected through flows of financial and professional services, but Mans (2014) proposes that we

“revisit city connectivity” by considering how global production networks connect cities. The importance of a city can be industry- and region-specific as he has demonstrated for the case of Khartoum, Sudan and the oil trade. This approach will open new research avenues that specifically consider the role and connectedness of peripheral cities within the global economy. Relatedly, subnational location choice research can be conducted at an even more granular level. We have emphasised here the importance of considering the place and space between cities. Related research should focus at the district or ZIP Code (postcode) level because the location choice *within* a city can also be construed as one of place and space (Guzman & Stern, 2015) and financial services and KIBS are unlikely to randomly establish offices within a city. Analogous to the country-subnational discussion, mega-cities in developing economies do not provide a uniform business environment, but often have dedicated commercial and educational centres (McKinsey, 2011) as well as peripheries.

## **5.2 Conclusion**

Our research seeks to form a better understanding of the subnational locational determinants of FDI by investigating foreign investment into peripheral cities. The core theoretical contribution of this paper is in showing how interactions across place and space can impact on the subnational locational determinants of FDI. Specifically, we demonstrate that core-periphery distances play a significant role in attracting FDI to peripheral locations. This makes an important contribution to the international business literature by highlighting that foreign investors will consider a city’s relative spatial positioning in addition to its place specific characteristics. We further highlight methodological devices that can be used to empirically investigate spatial relationships across subnational locations. The central implication of this work is that international business scholarship can benefit by further integrating concepts and frameworks from the economic geography literature in the

theorising the behaviour of MNEs. In doing so, the field can form more fine-grained insights into how MNEs are influenced by heterogeneity and contextual nuances across geographic place and space.

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**Table 1. Correlation table**

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 FDI	4.077	3.426														
2 Government effectiveness	0.015	0.992	0.1997													
3 Local productivity	0.014	0.999	0.431	0.3932												
4 GDP per capita	26182.13	16354.3	0.4344	0.2311	0.4621											
5 Population	8.487	0.560	-0.0697	0.1018	0.1784	-0.1546										
6 Foreign agglomeration	0.212	0.260	0.6201	0.3788	0.5198	0.6564	-0.1207									
7 Logistics	112.361	106.839	0.2573	0.074	0.3602	0.4782	0.4369	0.3252								
8 Infrastructure	9.102	0.675	-0.2095	-0.0287	-0.0591	-0.2059	0.6938	-0.2587	0.2046							
9 Industrial activity	4.163	0.938	-0.0723	0.1395	0.2227	0.2681	0.3308	0.116	0.4443	0.1966						
10 Coastal	0.636	0.482	0.2131	0.19	0.2787	0.3819	-0.0237	0.3504	0.2181	-0.0508	0.0888					
11 Periphery	0.746	0.436	-0.1554	0.2186	-0.1423	-0.2059	-0.1752	-0.0415	-0.3857	0.0146	-0.1017	0.0027				
12 Geographic prox	-0.035	0.992	0.2932	0.4748	0.3213	0.2945	0.1847	0.3123	0.1731	-0.0197	0.1841	-0.0455	0.1485			
13 Periphery-core prox	-0.006	1.010	-0.0735	0.158	-0.1154	-0.1888	0.0382	0.0091	-0.2109	0.1191	-0.1576	0.0193	0.6529	-0.1177		
14 Periphery-national core prox	0.014	1.014	-0.244	-0.4313	-0.343	-0.2794	-0.1681	-0.376	-0.2997	-0.015	-0.14	-0.311	-0.1338	-0.599	0.0464	
15 Periphery-regional core prox	0.002	1.014	0.1375	0.2689	0.0825	0.1604	-0.0116	0.3885	0.0584	-0.0021	-0.0321	0.1511	0.4845	0.0444	0.6345	-0.3184

**Table 2. Main models**

	FDI (2006-2009)		
Method: GLS RE	Model 1	Model 2	Model 3
Government effectiveness	-0.161 (0.289)	-0.164 (0.289)	-0.237 (0.292)
Local productivity	0.831*** (0.292)	0.831*** (0.292)	0.863*** (0.292)
GDP per capita	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Population	-0.555 (0.554)	-0.524 (0.557)	-0.871 (0.580)
Foreign agglomeration	2.939*** (1.054)	2.951*** (1.055)	2.587** (1.069)
Logistics	0.004* (0.002)	0.004** (0.002)	0.004* (0.002)
Infrastructure	-0.567* (0.293)	-0.556* (0.294)	-0.556* (0.292)
Industrial activity	-0.390* (0.202)	-0.388* (0.202)	-0.335* (0.203)
Coastal	0.667 (0.537)	0.649 (0.538)	0.743 (0.538)
Periphery	-1.000* (0.599)	-0.926 (0.615)	-2.034** (0.829)
Geographic prox	0.789*** (0.288)	0.597 (0.464)	1.016*** (0.314)
Periphery×Geographic prox		0.270 (0.511)	
Periphery-core prox			0.612* (0.340)
Constant	15.16*** (4.383)	14.70*** (4.470)	18.34*** (4.719)
Year dummy	YES	YES	YES
Observations	472	472	472
Number of city	118	118	118
R square	0.42	0.42	0.42

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 3. Post hoc analysis**

<b>Method: GLS RE</b>	<b>FDI (2006-2009)</b>		
	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
Government effectiveness	-0.143 (0.290)	-0.226 (0.292)	-0.183 (0.283)
Local productivity	0.837*** (0.292)	0.869*** (0.293)	0.830*** (0.284)
GDP per capita	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Population	-0.540 (0.554)	-0.723 (0.562)	-0.479 (0.554)
Foreign agglomeration	3.018*** (1.058)	2.211* (1.135)	2.557** (1.113)
Logistics	0.006** (0.002)	0.004* (0.002)	0.005** (0.002)
Infrastructure	-0.568* (0.293)	-0.567* (0.292)	-0.478 (0.291)
Industrial activity	0.817 (0.573)	0.708 (0.538)	0.596 (0.522)
Periphery	-0.958 (0.601)	-1.684** (0.724)	-7.050*** (1.867)
Industrial activity	-0.398** (0.202)	-0.359* (0.202)	-1.225*** (0.337)
Geographic prox	0.922*** (0.337)	0.924*** (0.298)	0.914*** (0.290)
Periphery-core prox			
Periphery-national core prox	0.241 (0.321)		
Periphery-regional core prox		0.510* (0.303)	0.574* (0.296)
Periphery×Industrial activity			1.263*** (0.404)
Constant	14.93*** (4.391)	17.18*** (4.541)	18.03*** (4.435)
Year dummy	YES	YES	YES
Observations	472	472	472
Number of city	118	118	118
R square	0.42	0.41	0.45

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 4. Robustness checks**

	FDI (2001-2010)	FDI (2001-2010)	FDI (2001-2010)	FDI (2001-2010)
<b>Method: GLS RE</b>	<b>Model 7</b>	<b>Model 8</b>	<b>Model 9</b>	<b>Model 10</b>
GDP per capita	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Population	-2.551*** (0.474)	-2.555*** (0.476)	-2.867*** (0.468)	-2.696*** (0.463)
Foreign agglomeration	-0.989 (0.915)	-1.001 (0.916)	-2.862*** (0.936)	-2.465*** (0.929)
Logistics	0.007*** (0.002)	0.007*** (0.002)	0.006*** (0.002)	0.006*** (0.002)
Infrastructure	0.768*** (0.291)	0.766*** (0.293)	0.771*** (0.285)	0.810*** (0.286)
Industrial activity	-0.407** (0.202)	-0.407** (0.202)	-0.364* (0.198)	-0.924*** (0.311)
Coastal	2.391*** (0.484)	2.394*** (0.485)	2.199*** (0.477)	2.097*** (0.462)
Periphery	-1.563*** (0.548)	-1.575*** (0.562)	-4.017*** (0.645)	-7.572*** (1.752)
Geographic prox	1.668*** (0.245)	1.700*** (0.423)	1.927*** (0.244)	1.918*** (0.237)
Periphery×Geographic prox		-0.0443 (0.492)		
Periphery-regional core prox			1.852*** (0.267)	1.890*** (0.262)
Periphery×Industrial activity				0.860** (0.387)
Constant	20.51*** (3.613)	20.58*** (3.686)	25.28*** (3.614)	25.90*** (3.546)
Year dummy	YES	YES	YES	YES
Observations	1,180	1,180	1,180	1,180
Number of city	118	118	118	118
R square	0.18	0.18	0.23	0.26

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1