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Ever-transient FDI and ever-polarizing regional development: Revisiting conventional theories of regional development in the context of China, Southeast and South Asia

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Abstract

In this new age of globalization, regions attempt to attract foreign direct investment (FDI) in order to achieve regionally balanced development. We revisit existing theories of regional development and FDI by analyzing recent data sets on FDI, employment, and trade in China, Southeast Asia, and South Asia. Using Chinese provincial data in 2004, 2008, and 2013 and applying panel estimations, our econometric results demonstrate that FDI remarkably influenced the concentration of employment in manufacturing, financial, and business services industries within the three Chinese macro-regions. We also find that FDI is ever transient, always moving away from high-cost to low-cost production bases across different regions. This transient nature of FDI is spatially selective and biased, and not able to generate the trickle-down effects to other neighboring regions. That is why FDI recently moved from China to Southeast and South Asia rather than from its coastal to inland regions. Furthermore, we show that this nature of FDI generally leads

to polarization development for regions. As a synthesis or extension of the existing theories, we propose a *leapfrog polarization pattern and strategy* for vast developing countries in considering their regional development strategies.

1 | INTRODUCTION

China's transition from a centrally planned economy to a socialist market economy forced its leaders to deeply commit to policies resulting in unbalanced growth and uneven regional development. During the post-reform era, economic policies favored specialization along the lines of comparative advantage, the spatial division of labor, and regional specialization (Fan, 1995; Zhao, 1996). Rather than worrying about uneven development, Chinese economic policies had to maintain steady economic growth, while sustaining political and social stability. Fiscal decentralization, the active promotion of market-oriented reforms replacing central planning, and increased participation in global trade and investment have profoundly affected China's regional development over the past 40 years.

In published studies about regional development, academics heatedly debate how regions successfully develop, how to maintain balanced economic and social development between regions, and why some regions outperform others. Scholars such as Storper (1997) and Ozawa (2005) focus on how export-led industrialization plays an active role in the development of specific regions within a country as well as across countries. Another strand of literature focuses on how intrinsic conditions in a region can buoy economic development by affecting the region's ability to adopt new technologies, stimulate entrepreneurship, promote human capital accumulation, and extend institutional capacities and capabilities (Lucas, 1988; Romer, 1986). Other studies show how a locality can deploy its indigenous capabilities and, by developing and using homegrown innovations, provide complementary assets to encourage foreign direct investment (FDI) (Stimson & Stough, 2009). While the conventional literature provides deep insights into various approaches and strategies that have been used to encourage regional development, many of these tactics arise as a result of developed countries' experiences.

Several questions remain unsolved in these literatures. First, how do conceptual theories of regional development theories—espoused by the likes of Martin and Sunley (1998) or Ozawa (2005)—stand up to statistical testing? Second, how do conventional regional development paradigms that have evolved in or from developed countries—championed by authors like Amin and Thrift (1992) as well as Dunning and Lundan (2008)—address development in developing countries? Third, previous studies have established the resulting uneven development from international trade (Rodriguez-Pose, 2012; Storper, Chen, & De Paolis, 2002)—however, such research fails to evaluate how FDI can contribute to regional development. Using more recent data from 2000 to 2016—because recent data have shed new light on many of the aforementioned theories—our study intends to both answer these questions and extend previous research.

Over the past four decades, China has received massive amoounts of international investment and has undergone rapid, perhaps unprecedented, economic growth. Thus, China's experience with economic development provides ample opportunities to reassess conventional regional development theories. In addition to China, members of the Association of Southeast Asian Nations (ASEAN)[1] and members of the South Asian Association for Regional Cooperation (SAARC)[2] also provide useful case studies. These case studies can help us determine the applicability of those theories for other developing countries. That is, many countries in the Global South demand solutions for the harms

of regional inequality (Martin, Tyler, Storper, Evenhuis, & Glasmeier, 2018; Storper, 2018), so these experiences may provide some solutions.

'This paper is organized as follows. The first section gives introduction. Section two reviews the relevant literature and summarizes important regional development theories. Section three describes relevant data sets and research methodologies for our topic. Section four places China's regional development in context by analyzing recent FDI and employment data. Section five discusses and analyses our results. The final section offers conclusion.

2 | THEORETICAL BACKGROUND

2.1 | Review of the conventional theories pertaining to regional development

Polarization theories address locational differences in markets and factor endowments, which traditional neoclassical growth theories ignore (Storper, 2011). Perroux's (1950) "growth pole" theory argues for the selection of key industries as the drivers (or *growth poles*) of economic development, and these poles should subsequently help grow the whole national economy. Myrdal's (1957) theory of circular causation explains that economies of scale lock-in any differences regarding initial growth rates between regions, areas, or industries. In a similar vein, Hirschman (1958) emphasizes and clarifies that policy makers should adopt development strategies that focus on priority growth sectors. In essence, growth trickles down as growth passes from these key economic sectors to laggard sectors. The ultimate effects of these growth poles depend on the balance between their favorable and unfavorable effects upon economic activities located in the country's hinterland. Friedmann (1966) continues in this direction, arguing that growth in a core helps to drive growth in the peripheral areas of an economy. In the long run, growth spreads from poles or cores to hinterlands and peripheries, which progressively balances out and integrates all geographical areas of the economy.

A substantial body of literature documents the ways that FDI upsets the balance—that is, engendering uneven regional development. Hymer (1972) underscores the oligopolistic nature of multinational enterprises (MNEs) operations and describes the way FDI geographically clusters. In contrast, geographically dispersed industries rely on local investment. According to Vernon's (1974) product cycle (PC) hypothesis, firms set up international production facilities to take advantage of a monopoly position. Once their products become standardized (or their production processes mature), these firms will try to lower their costs and improve their efficiency by investing in geographically concentrated areas. Dunning and Lundan's (2008) OLI model highlights the importance of *Ownership*-specific, *Location*-specific, and *Internalization*-specific advantages in determining where FDI flows abroad. Locational advantages derive from abundant natural resources, cheap labor, and low transportation costs. Ownership advantages include holding legal rights over high-end technology, intellectual property, and advanced managerial skills (via contracts). Lastly, MNEs can internalize both advantages by directly investing abroad. Consequently, FDI serves as an organizational strategy aimed at increasing profits while reducing costs, and many research findings show how such FDI remarkably influences regional development in China (Zhao, Chan, & Chan, 2012).

2.2 | Development economic theories revisited

Classical economic theories of international trade emphasize the principle of comparative advantage. Akamatsu (1961), a leading advocate of such an approach, points out how developing Asian countries

gained a Ricardian-style comparative advantage using their labor-intensive economies to position themselves behind the advanced industrial nations on the industrial value chain. According to his so-called wild-geese-flying pattern of development, Akamatsu says these developing countries exported goods and services—such as basic consumer and industrial goods—mostly stop produced by developed economies. By selling to advanced economy markets, the developing countries benefitted from their own specialization and export-oriented growth, which was spurred on by development in the advanced nations. Thus, developing countries can rapidly develop by stressing innovation within their own "leading sectors," and by fostering dynamic comparative advantages in light industrial manufacturing, as well as, later, heavy industry and consumer electronics (Liu & Dunford, 2016; Ozawa, 2005). Zhang and Zhang (2003) argue globalization forces determine the comparative advantage of a country or region, while regions neighboring the more developed countries may have the locational advantage for trade and attracting FDI over those farther and less assessable landlocked regions, and they may experience phenomenal economic growth.

Instead of prioritizing the location of machines or "poles," the endogenous growth literature focuses more on human capital and the location of highly skilled workers. Lucas (1988) highlights, particularly, the link between human capital accumulation and economic growth. Romer (1986) shows the stock of human capital affects economic growth by promoting technological innovation and diffusion. The "endogenous" part of endogenous growth theories derive from the way that human capital accumulation occurs as a function of technological change. More or less, regions with higher stocks of human stock develop faster than regions without such capital. Although these types of theories help explain the evolving nature, dynamics, forms, and structures of regional development, they underestimate the importance of social, historical, and institutional contexts that shapes the operation of the growth processes (Li, Wang, Westlund, & Liu, 2015; Martin & Sunley, 1998; Wang & Richman, 2018). Yeung (2009) argues that the region should enhance its indigenous capabilities, such as local innovation, production capacity, strategic industrial policies, and local networks of association, to strengthen the multi-scalar processes of regional development.

New economic geography attempts to explain why certain regions outperform others. Krugman (1991) develops a core periphery model, which proposes that production units geographically concentrate in order to take advantage of increasing returns to scale as well as positive externalities to agglomeration, and, also, to establish forward and backward linkages with upstream and downstream sectors. They also cluster near larger markets to reduce transport costs and better serve large markets. These factors result in self-reinforcing agglomeration, which then result in regional inequalities. However, as Storper (2011) argues, theories of agglomeration-induced specialization fail to explain the basic drivers of regional advantage, such as the causes of one-off events and structural factors.

2.3 | Roles of globalizing force in development theories—A neglected factor?

The discussed literature points to considerable evidence that suggests FDI induces increasing spatial polarization between core regions and hinterland, as well as aggravates sectoral differentiation within or across regions (Doytch & Uctum, 2019; Ozawa, 2005; Zhao, Chan & Chan, 2012). Zhang (2001) points to FDI's effect on the development of a particular region—as well as its overall economic growth—by encouraging capital formation, employment growth, and technological transfer and diffusion. Along this line, Amin and Thrift (1992) argue that if firms in a region can successfully "hold down the global" (namely, introduce themselves in global production activities), regions like these can host self-

sustaining units of economic development. In recent years, many scholars—such as Martin et al. (2018) and Storper (2018)—point to the globalization of trade, capital flows, technological change, changes in economic structures, and domestic policy as major forces driving uneven development between cities and regions and, also, across countries. The prevalence of agglomeration economies, knowledge spillovers from concentrated regions to less dispersed hinterlands, and the improvement of physical connectivity between regions may, in part, help us understand the exacerbation of regional inequality (Iammarino, Rodriguez-Pose, & Storper, 2019). However, clearly, further research must closely evaluate how FDI profoundly interacts with regional local development.

How do the evolutionary patterns of FDI interact with a region's endogenous conditions and indigenous capabilities to foster regional development? Does such FDI help, eventually, transform an entire region or a country? Or does such FDI merely polarize specific industrial sectors and regions? To address these questions, which are left unanswered by the literature, we hypothesize that FDI-led development largely aggravates regional imbalances within the host region. Furthermore, we postulate that, because globalization drives transient FDI, firms engaged in such FDI seek out low-cost production regions and, thus, help spur leapfrog development (as well as geographic polarization). And so, within particular regions, such FDI may lock-in growth and interact with these regions' endogenous conditions and indigenous capabilities in order to motivate local economic development.

3 | METHODOLOGY AND DATA

3.1 | Empirical method

The objectives of this study center on assessing the spatial behavior of FDI and, in turn, determining whether or not FDI trickles down from high FDI concentration regions to less concentrated regions, achieving a balance across regions. Based on the Seventh Five-Year Plan, we divide Chinese provinces and municipalities into three macro-regions: Eastern, Central, and Western China. On the one hand, we adopt Hirschman's (1958) definition of trickle-down effects, as positive effects generate from the spread of growth toward stagnant or less dynamic regions. Such trans-border, trans-regional, and trans-provincial trickle-down effects can potentially transform the spatial organization of regions. On the other hand, spillover effects refer to the benefits generated by externalities that spillover to nearby locations. Compared to trickle-down effects, these intra-regional and intra-sectoral spillover effects occur over smaller geographical distances, more limited scales, and more limited scopes. If one conceives of spillover effects as the small ripples generated by water drops, trickle-down effects represent the splashes, swells, and waves generated by a large impact event.[3]

We used several data sets for our study. First, we gathered inward FDI data for China from the *Provincial and Municipal Statistical Yearbook* from 2000 to 2016, as well as FDI data for ASEAN and SAARC member states from the United Nations Conference on Trade and Development (UNTCAD) between 2000 and 2016. We compiled employment data from three Chinese Economic Censuses that were conducted at the end of 2004, 2008, and 2013. These data include employment levels in all sectors as well as in all provinces, autonomous regions, and municipalities. Such data can show the geographical concentration or the spatial agglomeration of different industries over the three census years. Analysis of these data provides evidence in favor or against FDI causing industrial upgrading, economic transformation, and trickle-down effects. These employment data would also show the regional balance of economic growth between China's three macro-regions.

To reflect the concentration of industries across provinces-regions (O'Donoghue & Gleave, 2004), we computed the standardized location quotient, SLQ_{ij} for industry i in region j as follows:

$$\mathrm{SLQ}_{ij} = \frac{\mathrm{LQ}_{ij}/\overline{\mathrm{LQ}_i}}{\mathrm{stdv}(\mathrm{LQ}_i)}$$

where LQ_{ij} represents the original location quotient *LQs* for industry *i* in region *j*. Also, $\overline{\mathrm{LQ}_i}$ and $\mathrm{stdv}(\mathrm{LQ_i})$ refer to mean and standard deviation of *LQs* of industry *i* across all regions. In this study, we choose using a z-score with p-value of .20 to find cases significantly different from the mean as unusual cases. Using a smaller *p*-value would only pick out more extreme cases, and using a larger *p*-value would result in showing too many regions with low levels of agglomeration. Readers familiar with the more common .05 (or 5%) level of confidence will note that we do not use such a threshold to test a hypothesis, but, instead, to select interesting cases.

Our analysis of manufacturing employment focused on several two-digit Standard Industrial Classification (SIC) codes collected from the three Chinese economic censuses we previously discussed. These data allow us to assess shifts in manufacturing employment among major Chinese industrial sectors on a regional scale. Based on Li and Haynes (2011) as well as Ozawa (2005), we have chosen to examine, specifically, textiles and leather goods manufacturing, rubber and metal product manufacturing, and electrical machinery and equipment manufacturing. Textiles and leather goods manufacturing industries are largely export-oriented, labor-intensive, and footloose in nature. Capital-intensive rubber and metal product manufacturing focuses on domestic sales. The high-tech industries around electrical machinery and equipment manufacturing encompass the assembly of electronic products, using assembly lines to relocate to other countries or areas.

We assembled the last set of data from multiple sources. These data include the annual export values of information, communication, and technology (ICT) products from Vietnam, Philippines, Thailand, Indonesia, Malaysia, Singapore (known as the ASEAN-6), and China from 2010 to 2015. In addition, we acquired information relating to MNEs—from newspapers, business magazines, and ASEAN annual investment reports for various years—about the closure and relocation of electronic manufacturing plants in China. We used these data to study how FDI encourages polarization across regions while, at the same time, interacting with these regions' endogenous conditions and indigenous capabilities.

3.2 | Estimation method—Panel data analysis

Following He, Wei, and Xie (2008) and Wei (2007), to test the impact of FDI on SLQ, first, we extracted the data from *China Statistical Yearbook* and *Chinese Provincial and Municipal Statistical Yearbook,* and then we performed the panel data estimations. Pooled ordinary least square (POLS), fixed effects (FE), and random effects (RE) models are deployed in our estimations, including 31 provinces multiplied by 3 years (i.e., 93 provincial observations). More specifically, we formulated the econometric models that are specified as follows[4]:

$$\begin{aligned}\mathrm{SLQMAN}_{it} = {} & \alpha_i + \beta_1 \mathrm{FDI}_{it} + \beta_2 \mathrm{GPC}_{it} + \beta_3 \mathrm{VAT}_{it} + \beta_4 \mathrm{Patent}_{it} + \beta_5 \mathrm{Policy}_{it} \\ & + \beta_6 \mathrm{HC}_{it} + \beta_7 \mathrm{PC}_{it} + \varepsilon_{it} \ (i = 1, 2, 3, \ \ldots., 31 \text{ and } t = 1, 2, \text{and } 3)\end{aligned} \tag{1}$$

$$\begin{aligned}\mathrm{SLQFIN}_{it} = {} & \alpha_i + \beta_1 \mathrm{FDI}_{it} + \beta_2 \mathrm{GPC}_{it} + \beta_3 \mathrm{VAT}_{it} + \beta_4 \mathrm{Patent}_{it} + \beta_5 \mathrm{Policy}_{it} \\ & + \beta_6 \mathrm{HC}_{it} + \beta_7 \mathrm{PC}_{it} + \varepsilon_{it} \ (i = 1, 2, 3, \ \ldots., 31 \text{ and } t = 1, 2, \text{and } 3)\end{aligned} \tag{2}$$

where the dependent variables SLQMAN_{it} and SLQFIN_{it} represent the concentration of the employment in the manufacturing, and finance-business service industries in province *i* and year *t*,

respectively. α's are the intercept terms, β_i's are the POLS/FE/RE parameters for the respective independent variables and controls, and ε_{it}'s are the stochastic error terms. Also we choose a number of explanatory variables in this study. Table 3 presents the definition of each variable.[5]

A critical independent variable, *FDI*, has been widely employed to examine the relationship with industrial agglomeration (Fan & Scott, 2003). We postulate a positive relationship between *FDI* and *SLQ*. Regarding the set of control variables, we introduce the per capita gross domestic product (*GPC*), value added tax revenue (*VAT*), number of patent(s) granted (*Patent*), policy of change in reporting method of population counts (*Policy*), human capital (*HC*), and physical capital (*PC*). To control the effects of marketization induced by inter-firm linkages, scale economies and a region's comparative advantage (He, Wei & Xie, 2008), we specifically consider the independent variables *GPC*, *Patent*, *Policy*, *HC*, and *PC*, which involve level of economic development, technology intensity, change in population policy, labor intensity, and level of infrastructure development. We expect that all these control variables are positively associated with *SLQ*. Similarly, to control the impact of economic decentralization caused by inter-regional competition and local protectionism (Wei, 2007), we use *VAT* to be the control variable. We hypothesize that there is a positive relationship between *VAT* and *SLQ*.

4 | STATISTICAL RESULTS

4.1 | Foreign direct investment flows and Chinese economic development

Eastern Chinese regions have attracted significant proportions of China's FDI. Figure 1 shows the inward FDI to Eastern, Central, and Western Chinese regions from 2000 to 2016. Inward FDI flows to the eastern region grew from \$39 billion USD in 2000 to \$146 billion USD in 2016, with a peak in 2014 at around \$176 billion USD. During the same period, inward FDI flows to the central region jumped from about \$5 billion USD in 2000 to around \$80 billion USD in 2016, as the western region's

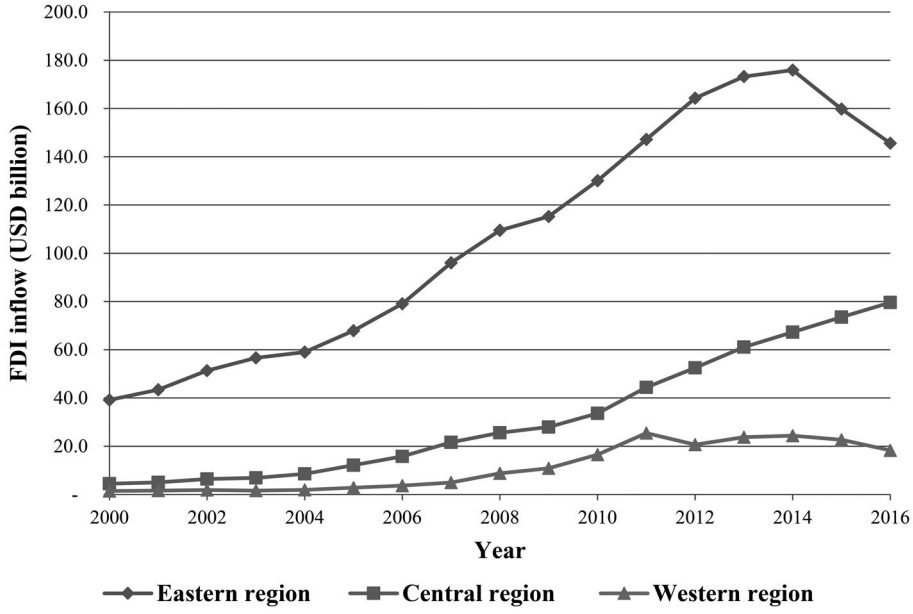

FIGURE 1 Inward FDI flow of China by regions (2000–2016). *Source*: China Provincial and Municipal Statistical Yearbook (various years)

inward FDI grew from $1 billion USD in 2000 to around $24 billion USD in 2014, and then declined to $18 billion USD in 2016. The Chinese government's "Go West" and "Rise of Central China" programs help explain these remarkable increases in the proportions of inward FDI going to central and western regions. As such, these programs helped achieve their objective of stimulating economic growth and development in Central and Western China. Such gains came at the expense of inward FDI in the eastern region as well as regions outside of China.

About as much inward FDI flowed into the ASEAN region as it did into China. Figure 2 shows the flows of FDI into China, the ASEAN, and the SAARC regions from 2000 to 2016. In essence, China's FDI inflows grew from around $40 billion USD in 2000 to $134 billion USD in 2016, with a small dip in 2009 after the global economic downturn. From 2000 to 2008, FDI into the SAARC countries followed the Chinese upward trajectory. However, after the global economic downturn in 2009, such inward FDI did not regain its former momentum, so, since then, inward FDI flows have remained below or around $40 billion USD per year. The ASEAN's inward FDI started the period at a low level of around $22 billion USD in 2000. Gradually, ASEAN's inward FDI climbed to around $86 billion USD in 2007, which is a level comparable to China's. The volume of FDI dwindled to $46 billion USD in 2009, but it surged back to around $126 billion USD and $130 billion USD in 2013 and 2014, respectively—thus, surpassing China's inward FDI flows for those years.

These data also exhibit three trends relevant for our analysis. First, inward FDI to China and the ASEAN countries (in general) not only recovered after declines during the 2008/2009 crisis, but afterward, they even attracted larger values of such investment. Second, although the ASEAN bloc (taken as a whole) received about the same level of inward FDI as China in 2007, FDI to the bloc dropped more precipitously than to China, bouncing back and surpassing China's flows in 2013 and 2014.The trajectory shows that, gradually, MNEs and international investors transferred such investment from China to the ASEAN region.

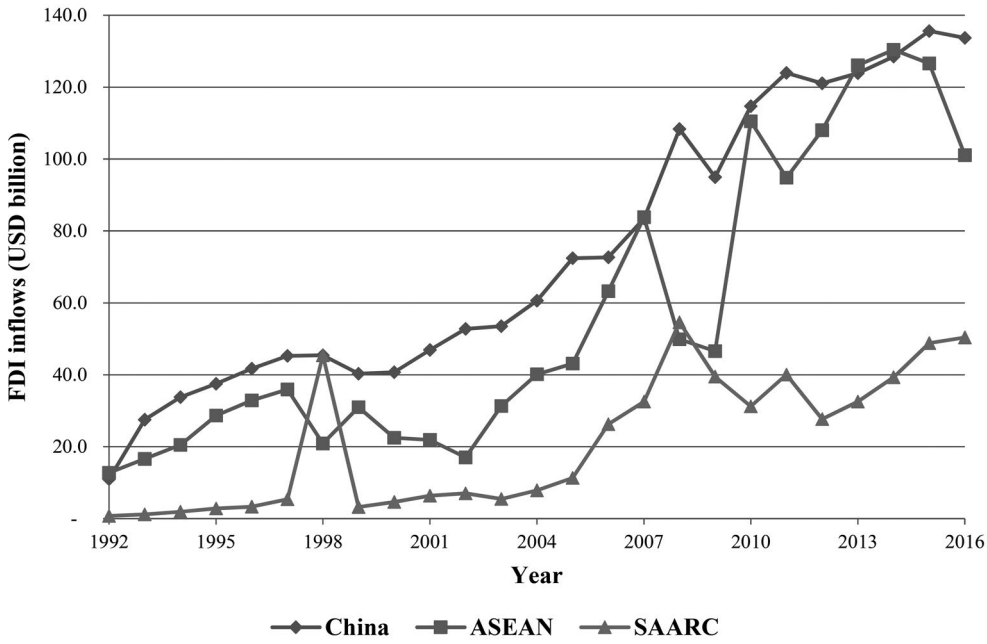

FIGURE 2 Inward FDI flows of China, ASEAN and SAARC (2000–2016). *Source*: The United Nations Conference on Trade and Development (various years)

4.2 | The changing economic geography of selected economic sectors

4.2.1 | Manufacturing industries

Manufacturing employment in China's coastal regions exceeded such employment in other regions. Figure 3a–c show, respectively, the 2004, 2008, and 2013 SLQs for China's manufacturing industry. Figure 3a shows the highest SLQs in the coastal provinces of Fujian, Jiangsu, and Zhejiang—that is, with SLQs 1.5 standard deviations higher than the national average in 2004. Some areas were even more than two standard deviations above the average, indicating an extreme level of concentration. Other coastal provinces, such as Guangdong, Tianjin, Hebei, and Shandong, have relatively high SLQs. However, the concentration of employment in Central China remained low (as measured by low SLQ values), and Western Chinese provinces exhibited mostly negative SLQ values. Thus, in 2004, manufacturing activity was more highly concentrated in coastal regions (relative to the national average) than those inland.

By 2008, manufacturing jobs from the Fujian and Zhejiang provinces seemed to spillover into Jiangxi. Figure 3b shows SLQs for 2008, with traditional manufacturing provinces along the coast (Guangdong, Fujian, Jiangsu, Zhejiang, and Shandong), again, having the highest SLQs. Yet again, SLQs in the central and western regions remained low to dip into negative values—all told, with SLQs measuring lower than −1.5 standard deviations away from the national average describing the north-central and part of China's northeast area. These negative values represent the falling concentration of manufacturing in those areas. Moreover, in 2008, only Fujian had a SLQ value higher than 1.5, as the concentration of manufacturing jobs in other coastal provinces approached the national average. Neighboring Jiangxi represented the only non-coastal province with an SLQ larger than 0.5. Therefore, Jiangxi's higher SLQ may indicate a spillover effect from the manufacturing-heavy Fujian and Zhejiang provinces.

It is clear that, by 2013, although some manufacturing jobs had moved inland, they still had not yet diffused to China's western regions. As shown in Figure 3c, coastal provinces still had relatively high SLQs, but their values were lower than those in previous censuses. For instance, none had an SLQ higher than 1.5. However, Henan joined Jiangxi—a group of non-coastal provinces with SLQ larger than 0.5—providing an additional sign that manufacturing activity might have spilled over into inland regions. Moreover, although the SLQs of those provinces in the central region had slightly increased, they were still in the negative territory. These results may imply that some of manufacturing bases had moved to the inland regions, but only limited to the central region, not to the western region, yet. And so, provinces as well as autonomous regions in China's western region still had negative SLQs.

Employment in light manufacturing exhibited a slightly different pattern of concentration. Figure 4a–c show employment levels—in 2004, 2008, and 2013—across China's three macro-regions for textiles and leather goods industries, rubber and metal product industries, and electrical machinery and equipment industries. Levels of employment in China's broad eastern regions parallel such concentration in the heavier manufacturing industry. However, in the eastern regions, employment in both the textile and leather goods industries and the rubber and metal product industries contracted between 2008 and 2013. By contrast, eastern employment in the electrical machinery and equipment industries continued to expand over the years. Employment in the electrical machinery and equipment industries not only expanded in Eastern China, but, also, in all three macro-regions. In fact, employment in all three types of industries expanded in Central China—particularly, with employment surges in the central area electrical machinery and equipment industries standing out. Also, the western regions' employment levels in the textile and leather goods industries remained unremarkable.

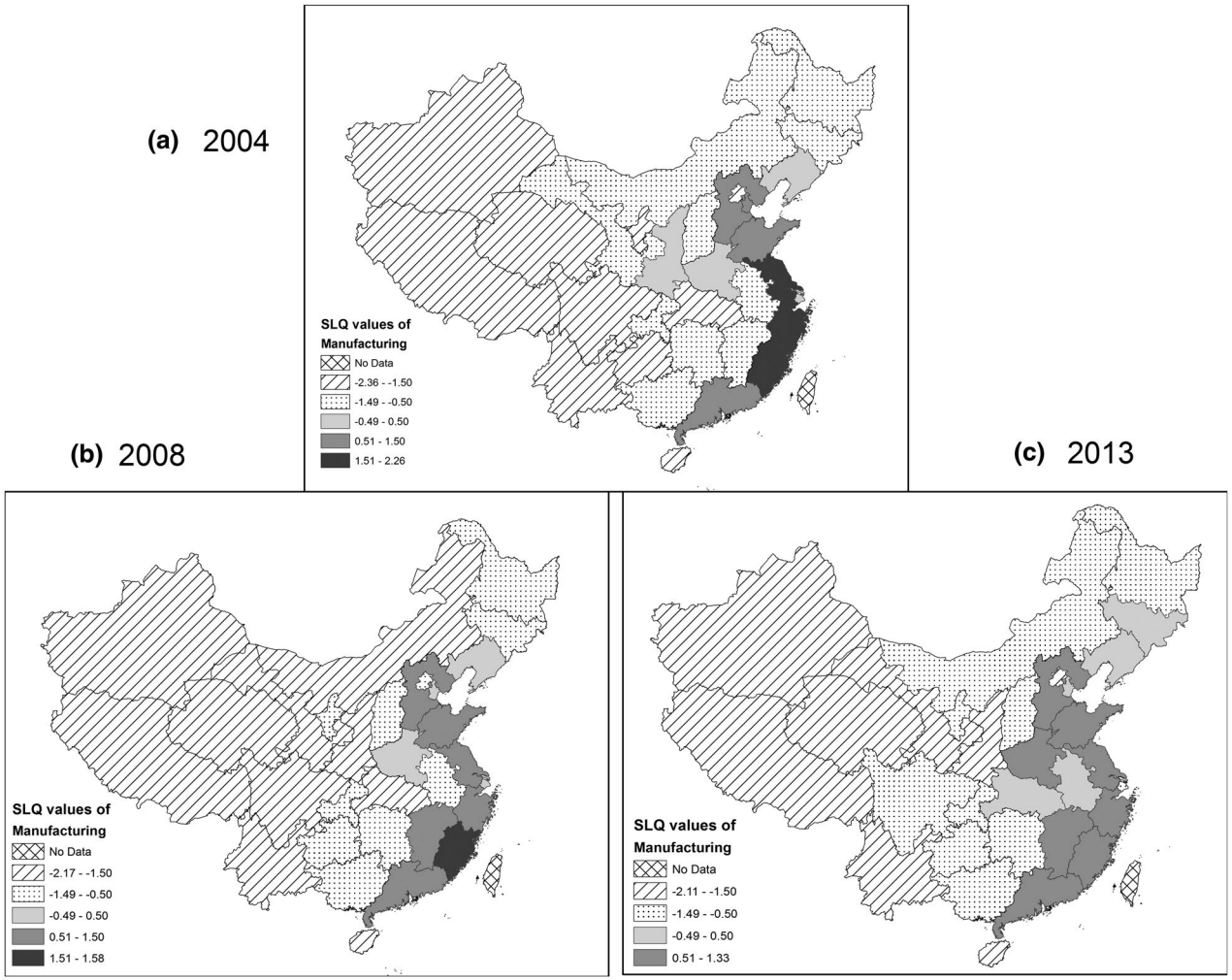

FIGURE 3 (a) 2004 Standardized location quotient map of the manufacturing industry, (b) 2008 Standardized location quotient map of the manufacturing industry, and (c) 2013 Standardized location quotient map of the manufacturing industry. *Source*: China Economic Census Yearbook 2004, 2008 and 2013

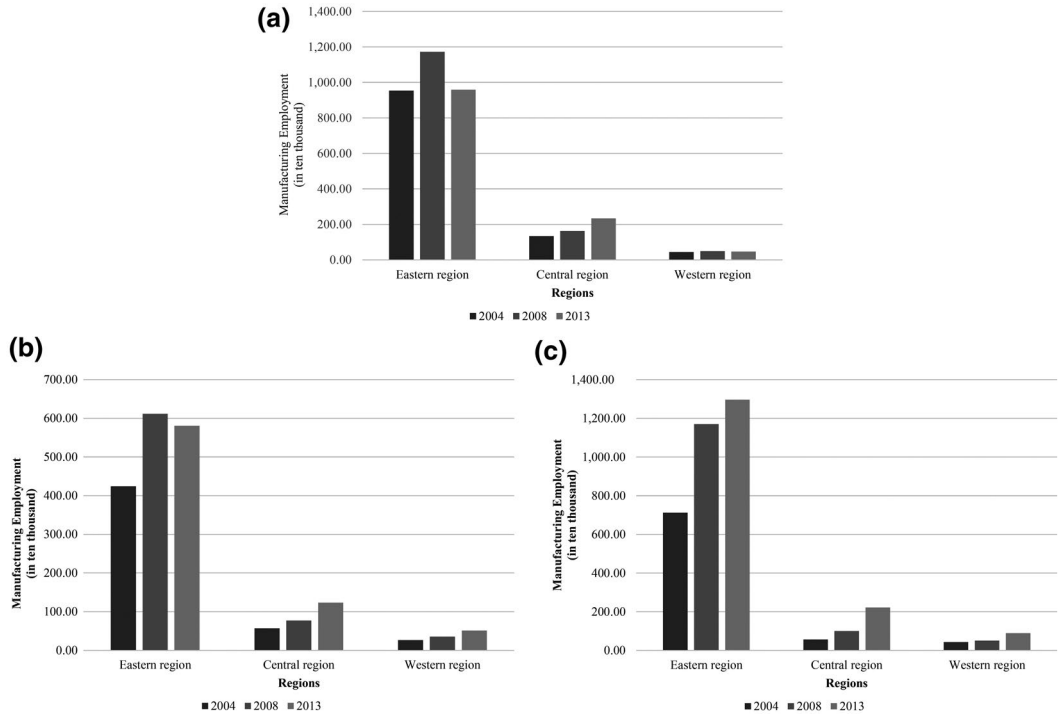

FIGURE 4 (a) Intra-sectoral manufacturing employment of textiles and leather goods industries in 2004, 2008, and 2013, (b) Intra-sectoral manufacturing employment of rubber and metal product industries in 2004, 2008, and 2013, and (c) Intra-sectoral manufacturing employment of electrical machinery and equipment industries in 2004, 2008, and 2013. *Sources*: China Economic Census Yearbook 2004, 2008, and 2013

Five other trends stand out from the data. First, in 2013, employment in Eastern China accounted for almost 80% of employment in the three types of industries that have been discussed. Central and Western China represented around 14% and 6%, respectively, of China's employment in these industries. Second, small increases in the central and western regions' employment did not make up for the sizable loss of employment in Eastern China's textiles and leather goods industries between 2008 and 2013. Third, Eastern and Central China's electrical machinery and equipment industries experienced a remarkable surge over the years, with less stellar growth in Western China. Fourth, as a consequence of these trends, eastern regions' industries demonstrate a spillover effect, which is unmatched by the trickle-down effect in China's central and western regions. Fifth, some manufacturing employment likely shifted from China's eastern regions to other areas outside China (that is, rather than simply moving, domestically, to China's central and western regions)—for example, from 2008 onward, employment in the textile and leather goods industry had shipped out from China.

4.2.2 | Finance and business services industries

China's finance and business services sectors repeat the trends of concentration exhibited by its manufacturing industries in China's coastal regions. Figure 5a shows the concentration of Chinese regional employment in 2004. Coastal region Liaoning's SLQ exceeded 1.5 while other coastal regions' SLQs—such as those in Beijing, Shanghai, and Tianjin—hovered between 0.5 and 1.5. These quotients for inland provinces such as Chongqing, Hebei, Anhui, and Hunan started off low. As shown in

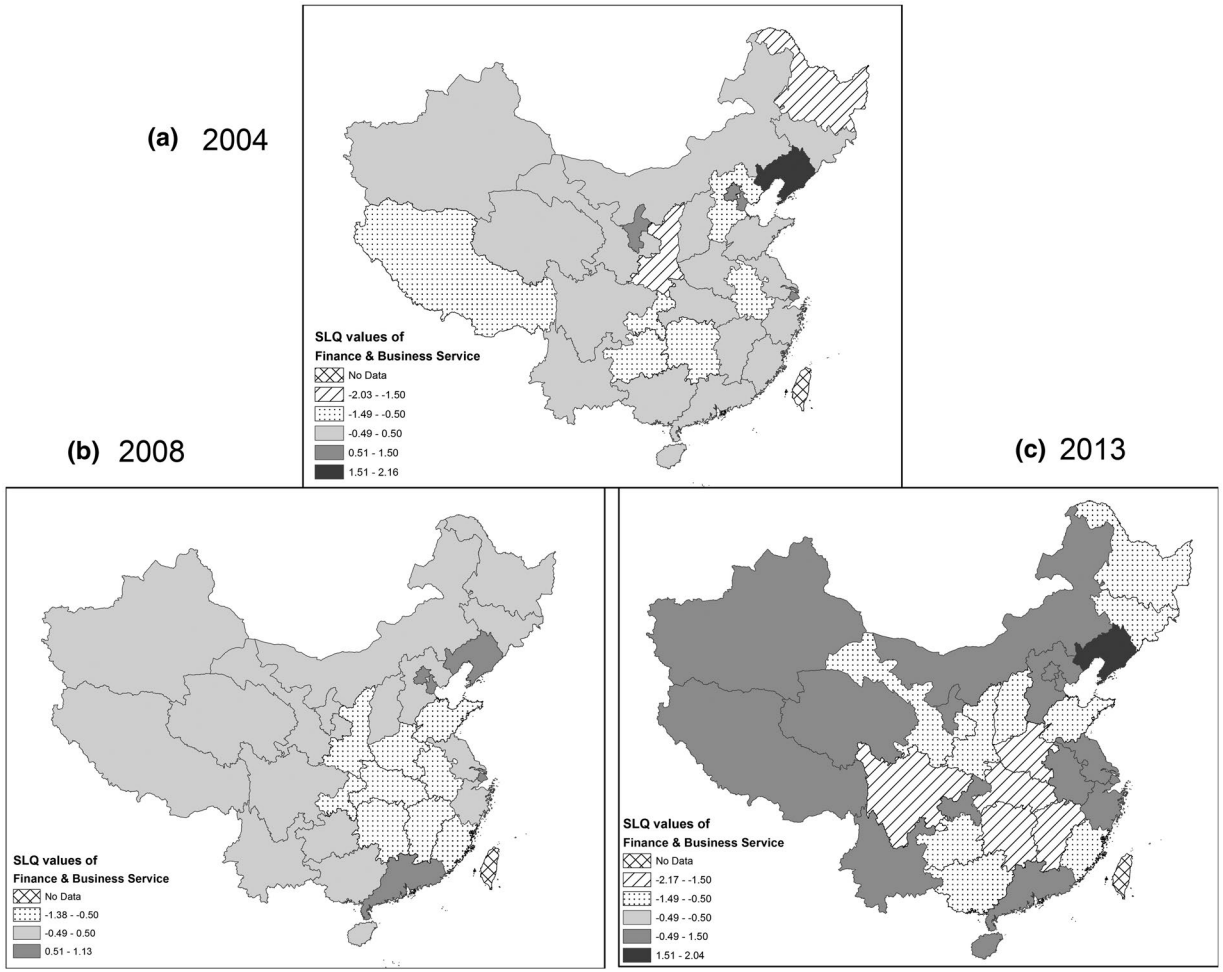

FIGURE 5 (a) 2004 Standardized location quotient map of the finance and business service industry, (b) 2008 Standardized location quotient map of the finance and business service industry, and (c) 2013 Standardized location quotient map of the finance and business service industry. *Source*: China Economic Census Yearbook 2004, 2008, and 2013

Figure 5b, Beijing, Shanghai, Tianjin, Guangdong, and Liaoning kept their relatively high SLQs between 0.5 and 1.1, showing how financial and business service employment continued to congregate in these regions. Chongqing, Shandong, Fujian, Anhui, Hunan, Hubei, and Shaanxi exhibited SLQs below −0.5, depicting the deconcentration of employment in the financial and business sectors there. By 2013, as represented by Figure 5c, while the SLQs of Beijing, Shanghai, Tianjin, Guangdong and Yunnan stayed between 0.5 and 1.5, Liaoning kept its first-place SLQ by exceeding 1.5. The inland regions of Shaanxi, Guangxi, Sichuan, Shanxi, and Gansu also had relatively low SLQs—that is, between −0.5 and −1.5. Hunan, Hubei, Guizhou, and Jiangxi had the lowest concentration of employment in these sectors, which is reflected by SLQs below −1.5.

The above findings indicate several phenomena during this time. First, employment in China's financial and business service industry forms clusters in China's major financial hubs: Beijing, Shanghai, and Guangdong. The prominent role Liaoning plays in China's commodity exchange business partly explains the high concentration of financial and business service employment in that region as well as in northeast China. The recent uptick of financial and business service employment in Yunnan stems from the implementation of new ASEAN microfinance regulations (China, 2013). Second, similar to the situation in manufacturing, spillover effects of financial and business service industry remained mainly confined to the coastal regions, and no obvious trickle-down effect occurred across/between China's three macro-regions. Third, employment within inland financial and business service sectors remained small—that is, compared to employment in the coastal regions.

4.2.3 | ICT industries

Because the latest employment survey data provided by China's economic census ran up to 2013, we could not document recent global shifts in the manufacturing industry. Hence, in order to observe more recent trends, we gathered the latest ICT trade statistics across China as well as the ASEAN. If a specific region can use its own indigenous resources and capabilities to produce ICT-related goods and services to be traded globally, a region's firms will likely undergo industrial upgrading and technological innovation (Ozawa, 2005). Evidence of such a process can be found in Figure 6.

China's ICT industry has started moving away from Eastern China to the ASEAN region. According to Figure 6, the annual ICT export values have slightly dropped in Eastern China since 2013. During this period, among the three regions shown in Figure 6, the ASEAN-6 performed well as the second largest exporter of ICT goods and services. ICT exports from the region did not decline from 2010 to 2015. The central and western regions of China exported only slightly more ICT goods than before, which is an increase almost too insignificant to report. In fact, annual ICT export values for Central and Western China, together, plateaued in 2014, while Eastern China's ICT export values kept dropping in 2015. Obviously, the data show that the ICT industry started moving away from Eastern China in 2013. Central and Western China have not benefitted from these declines. That said, the ASEAN-6 could be the beneficiary of such declines because ASEAN countries—such as Indonesia, Thailand, Vietnam, and Singapore—took up the slack. In addition, despite declines in export values, Figure 6 shows that the ICT industry still concentrates in Eastern China. Such dominance in export values may point to the continued industrial upgrading that keeps the region competitive. If true, such trends could indicate spillover effects within the region—that is, rather than trickle-down effects to ICT exporters in Central and Western China.

Over the years, many large MNEs have moved their production from China to the ASEAN and SAARC regions. Tables 1 and 2 show FDI inflows from MNEs into the ASEAN and SAARC member states, and, respectively, the recent closure of electronic manufacturing plants established by MNEs

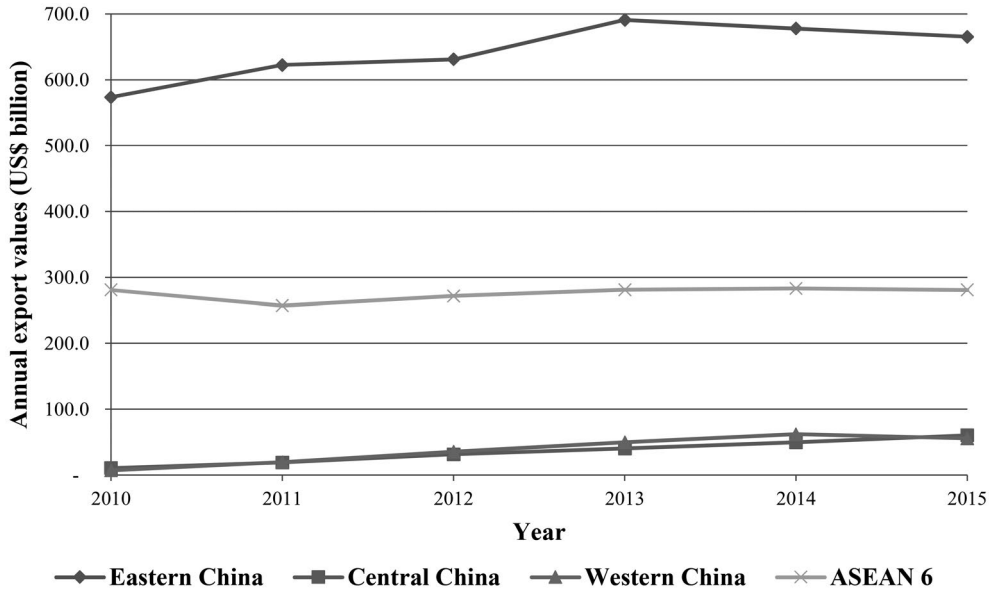

FIGURE 6 Annual export values of electronic products of China and ASEAN 6 (2010–2015). *Notes*: The annual export values of ICT products comes from the Yearbook of China's Electronic Industry, Foreign Trade Statistics of the Philippines, Indonesia Foreign Trade Statistics Export by ISIC Code, Yearbook of Statistics Singapore, external trade databases provided by the Department of Statistics of Malaysia and the General Statistics Office of Vietnam (http://www.data.gov.my/data/en_US/dataset/malaysia-s-exports-by-hs-4-digit-rm-year-2015 & http://gso.gov.vn/default_en.aspx?tabxml:id=626), and external custom database provided by Thailand Custom (http://www.customs.go.th/ statistic_report.php? show_search=1)

in China. Over the past few years, big corporations such as Microsoft and Samsung Electronics have relocated their manufacturing operations from China to the ASEAN region. What is more, other large MNEs—such as LG and Foxconn—have started to invest in the ASEAN and SAARC regions. Possible explanations for such direct investments outside of China include rising operating costs (i.e., rent and labor costs), increasingly stringent environmental protection standards, and lack of attractive investment policies in China.

4.2.4 | Results of panel data estimation

Table 3 reports the descriptive statistics for all variables while, in Tables 4 and 5, panel estimates of Equations (1) and (2) are shown. Only results from POLS are shown because Lagrange multiplier, likelihood ratio, and Hausman specification tests indicate that POLS is preferred to FE and RE estimations. According to Model 1–4 in Table 4, our results show that FDI has consistently positive and significant impacts on SLQMAN. Further, we performed the robustness check by conducting two least squares estimation and regression analysis by excluding the four municipalities—Beijing, Shanghai, Chongqing, and Tianjin—from our panel data set, and the results remained robust as well as consistent (see Models 5 and 6 in Table 4). Similarly, as indicated in Model 7–12 in Table 5, our estimates demonstrate that FDI has remarkably influenced SLQFIN. Our regression results strongly support that FDI, as a major representation of globalizing force, notably impacted the concentration of employment in manufacturing, financial, and business service industries within the three macro-regions.

TABLE 1 Manufacturing FDIs of electronic industry flown to ASEAN and SAARC

Company name	Country of origin	Nature of business	Location of manufacturing bases in ASEAN or SAARC	Amount of investment (US$)	Time of investment
Samsung Electronics Co., Ltd.	South Korea	Smartphone	Vietnam	$3 billion	November 2014
New Kinpo Group	Taiwan, R.O.C.	Consumer electronics	Philippines	$560 million	April 2015
LG Display	South Korea	Liquid crystal display	Vietnam	$1.5 billion	March 2016
Compal Electronics Inc.	Taiwan, R.O.C.	Personal computers	Vietnam	$500 million	February 2017
Samsung Electronics Co., Ltd.	South Korea	Smartphones, refrigerators, flat panel television	India	$7.5 billion	June 2017
Foxconn Technology Group	Taiwan, R.O.C.	Mobile phones	India	$5 billion	July 2017
LG Innotek	South Korea	Camera modules for Apple's mobile phone products	Vietnam	$230 million	October 2017
Meiko Electronics Co., Ltd.	Japan	Printed circuit boards	Vietnam	$50 million	October 2017

Sources: South China Morning Post, Taipei Times, Nikkei Asian Review, and ASEAN Annual Investment Reports (various years), complied by authors.

TABLE 2 Closure of electronic manufacturing plants established by MNEs in China

Company name	Country of origin	Nature of business	Location of manufacturing bases in China	Time of closure	Remark
Microsoft Corporation	The United States	Nokia's mobile phones	Beijing, Dongguan, Guangdong	February 2015	Relocation of manufacturing plants to Vietnam.
Koninklijke Philips N.V.	Netherland	Light emitting diode (LED)	Shenzhen, Guangdong	May 2016	
Seagate Technology Plc.	The United States	Hard disk devices	Suzhou, Jiangsu	January 2017	
SK Group	South Korea	Electric vehicle battery	Beijing	January 2017	
Nikon Corporation	Japan	Digital Camera	Wuxi, Jiangsu	October 2017	
UTAC Group	Singapore	Semiconductor devices	Shanghai	December 2017	Relocation of manufacturing plants to Thailand.
Nitto Denko Corporation	Japan	Liquid crystal display polarizing film	Suzhou, Jiangsu	February 2018	
Samsung Electronics Co., Ltd.	South Korea	Communications equipment	Shenzhen, Guangdong	April 2018	Relocation of manufacturing plants to Vietnam.

Sources: South China Morning Post, Taipei Times, Nikkei Asian Review, and ASEAN Annual Investment Reports (various years), complied by authors.

TABLE 3 Descriptive statistics of variables

Variable	Definition	Obs.	Mean	Min.	Max.	*SD*
SLQMAN	Standardized location quotient for manufacturing industry	93	−.644	−2.368	2.256	1.186
SLQFIN	Standardized location quotient for finance and business service industry	93	−.177	−2.180	2.156	.857
FDI	Inward foreign direct investment over gross regional product	93	.025	.001	.081	.020
GPC	Natural logarithm of the quotient of gross regional product divided by total number of population at year end	93	10.006	8.313	11.489	.722
VAT	Value added tax revenue over gross regional product	93	.013	.005	.039	.005
Patent	Natural logarithm of number of patent granted	93	8.493	3.135	12.387	1.779
Policy	Policy of change in reporting method of population counts	93	.333	.000	1.000	.474
HC	Number of people who have completed secondary education divided by the total number of population at year end	93	.005	.002	.009	.001
PC	Gross fixed capital formation over gross regional product	93	.561	.286	1.151	.167

5 | ANALYSES AND DISCUSSION

What do the results reported in the previous section teach us about the applicability of current regional development theories on the Chinese economy? In order to attract foreign capital and stimulate employment, the Chinese government adopted a policy to permit the coastal region to "get rich first." Growth pole theory deeply influenced the creation of such a policy during China's reform period. The spatial patterns of SLQs demonstrate the existence of multiple growth poles, such as Beijing, Shanghai, Jiangsu, and Guangdong. These growth poles have contributed rather considerably to regional growth along the coastal area. We also find that, although FDI shares in Central and Western China have gradually increased over time, most FDI is still concentrated in Eastern China. A likely explanation of these patterns lies not only in their inheritance of solid economic foundations during the economic reform era, but also, it is concomitant of strong agglomeration economies, large-scale domestic markets, and solid institutional environments and financial systems (Bao, Chang, Sachs, & Woo, 2002; Li & Haynes, 2011; Yu, 2018).

The Chinese case also shows the effect(s) of policies aiming to establish growth poles by attracting FDI to particular regions. After China implemented both the three economic-belts model and ladder-step theory of growth, Eastern China experienced large influxes of FDI (Zhao, 1996). In the 1990s, the "Go West" program also incentivized significant FDI flows into Western China. However, while both Eastern and Western Chinese companies benefitted from such FDI from 2000 to 2016, the Eastern Chinese economy has, undoubtedly, favorably transformed. Western Chinese province economies, in contrast, showed few signs of similar development. With unfavorable geographical locations, insufficient resource endowments, different industrial histories, as well as weak entrepreneurship and knowledge bases, Western Chinese areas could not attract similar FDI flows, which jeopardized local development. Thus, the Western Chinese experience demonstrates that FDI alone cannot engender a profound regional economy change—that is, unless the region also deploys its own indigenous capabilities to complement these FDI inflows. Even worse, the unbalanced geographic distribution of FDI

TABLE 4 FDI and concentration of the employment in manufacturing industry

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	−5.764**	−6.559***	−6.136***	−7.228***	−7.822***	−10.824***
	(2.269)	(2.347)	(2.296)	(2.387)	(2.516)	(2.582)
Foreign direct investment	11.727**	11.681**	10.508*	10.072*	10.658*	11.931*
	(5.599)	(5.581)	(5.717)	(5.681)	(5.804)	(6.222)
Per capita gross regional product	.185	.201	.342	.411	.406	.854**
	(.259)	(.259)	(.299)	(.301)	(.305)	(.329)
Value add tax revenue	−36.513*	−31.895*	−42.535**	−38.744**	−38.681**	−.872
	(18.554)	(18.843)	(19.419)	(19.428)	(19.719)	(24.332)
Number of patent granted	.383***	.378***	.314***	.287***	.171	.227**
	(.073)	(.073)	(.099)	(.099)	(.167)	(.104)
Policy	.649**	.843**	.612**	.839**	2.198	.941***
	(.301)	(.337)	(.303)	(.335)	(1.588)	(.352)
Human capital		101.352		124.286	149.578*	37.497
		(79.802)		(81.221)	(87.345)	(90.593)
Physical capital			−.866	−1.135	−1.073	−1.637*
			(.829)	(.841)	(.856)	(.888)
Observation	93	93	93	93	93	93
Degree of freedom	87	86	86	85	8	73
Adjusted R^2 value	.434	.437	.434	.442	.426	.541

Notes: Model (1)–(3) show estimates for each of the three variants of the FDI variables; Model (4) indicates regression results for model specification of Equation (1); Model (5) shows regression results for two-stage least squares estimation; Model (6) demonstrates regression results, excluding four municipalities (i.e., Beijing, Shanghai, Chongqing, and Tianjin). All models are based on the provincial panel data; t-statistics are shown in parenthesis: ***1% significance level; **5% significance level; *10% significance level.

flows reinforce endogenous regional economic polarization. FDI itself does not necessarily result in trickle-down effects across regions, which, as a result, might drive local industrial modernization and economic growth. Such growth still heavily relies on a region's indigenous capabilities to innovate and compete. FDI cannot quickly affect such deep economic structures, if at all.

Some evidence points toward FDI exodus from China, relocating to other regions. We can see the largest employment impacts in portable industries—such as textile and leather goods manufacturing—which can quickly move to other places. Employment in China's own textile and leather goods industries have declined since 2008. Such declines point to FDI migration outside of China. Yet, since 2013, employment in the less mobile sectors—such as rubber and metal product industries—has also declined. Therefore, declines in FDIs in both portable and non-portable industries points to FDIs relocating outside China, albeit gradually. The electrical machinery and equipment industries mainly stayed in Eastern China, but nothing in the data from the pre-2013 period suggests these industries would move to Central or Western China, as opposed to relocating abroad. After 2014, such FDI flows to China's electrical machinery and equipment as well as its ICT industries started to, indeed, relocate to other low-cost countries such as Vietnam and Thailand.

The recent exodus of MNEs from China, in addition to the massive amounts of FDI leaving China for the ASEAN and SAARC regions, lend support to the above research findings. The pace of relocation differs due to the degree of labor, capital, and technological-intensiveness of different economic

TABLE 5 FDI and concentration of the employment in finance and business service industries

Variables	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Intercept	−3.781**	−2.678	−3.743**	−2.436	2.929	−2.171
	(1.739)	(1.761)	(1.771)	(1.805)	(5.861)	(2.143)
Foreign direct investment	12.233***	12.297***	12.358***	12.879***	22.159**	14.401***
	(4.292)	(4.185)	(4.409)	(4.295)	(10.743)	(5.165)
Per capita gross regional product	.356*	.333*	.339	.258	−.372	.192
	(.199)	(.194)	(.231)	(.227)	(.693)	(.273)
Value add	64.233***	57.829***	64.851***	60.311***	80.016***	81.622***
tax revenue	(14.222)	(14.132)	(14.977)	(14.691)	(26.955)	(20.196)
Number of patent granted	−.144**	−.138**	−.137*	−.105	−.155	−.083
	(.056)	(.055)	(.076)	(.075)	(.107)	(.086)
Policy	.341	.071	.344	.073	1.299	.011
	(.231)	(.253)	(.234)	(.254)	(1.226)	(.292)
Human capital		−140.515**		−148.825**	−277.137*	−186.848**
		(59.851)		(61.413)	(150.287)	(75.195)
Physical capital			.088	.411	−.175	.662
			(.639)	(.636)	(.991)	(.737)
Observation	93	93	93	93	93	93
Degree of freedom	87	86	86	85	8	73
Adjusted R^2 value	.363	.394	.356	.391	.131	.251

Notes: Model (7)–(9) indicate estimates for each of the three variants of the FDI variables; Model (10) shows regression results for model specification of Equation (2); Model (11) demonstrate regression results for two-stage least squares estimation; Model (12) exhibits regression results, excluding four municipalities (i.e., Beijing, Shanghai, Chongqing, and Tianjin). All models are based on the provincial panel data; t-statistics are shown in parenthesis: ***1% significance level; **5% significance level; *10% significance level.

sectors. Yet, overall, our research findings support the "Flying-geese model" of regional development in which, depending on a sector's mobility (or ability to transplant production abroad), FDI moves from one region to another. The textile and leather goods industries represent highly mobile sectors while the rubber and metal product industries represent less mobile sectors, which leaves the electrical machinery and equipment as well as ICT industries representing some of the least mobile sectors.

Even if particular regions develop a comparative advantage over their trading partners, they may still face great challenges, while competing in global markets. That is, most MNEs' core technological activities are largely rooted in developed countries (Pavitt & Patel, 1991). Less developed regions may lack an absolute advantage—particularly, in high-tech industries such as semiconductors, software, or pharmaceutical products (Storper, 1997). Moreover, because most MNEs seek to use FDIs as a way of making production more efficient or cost-effective, rising labor costs, real estate prices, renminbi appreciation, and increasingly complicated international political relationships have, invariably, motivated a large number of multinational corporations to move their flexible manufacturing bases elsewhere. Having said that, some Chinese technology firms—such as Tencent, Alibaba, Baidu, Xiaomi, Lenovo, and Huawei—have risen to become top-tier global firms by acquiring technical know-how from previous FDI, while also, successfully exploiting their own indigenous capabilities (Ma, 2017) and transforming China into an innovative state and platform builder that is connected with global value chains (Wang, Chen, & Tsai, 2012).

Finally, echoed in Storper's (2018) and Iammarino et al.'s (2019) findings, we discover that the distinct geographies of employment, FDI, and trade give rise to regional convergence (or divergence) in China. Among cities and regions, the benefits of agglomeration across China resemble those found in the USA—where most of the innovation and technology firms geographically cluster within big metropolitan regions (Moretti, 2012; Porter, 2001)—but differ from those in the European Union, in which many industrial sectors are spreading out and the effect of history remains strong (Storper, Chen & De Paolis, 2002). Compared to less developed inland regions, largely developed coastal regions—such as China's Pearl River Delta (PRD), Yangtze River Delta (YRD), and Bohai Rim (BHR)—performed very well. Although FDI has profoundly influenced these big metropolitan regions' development, manufacturing employment has, nevertheless, shifted progressively from China to other low-cost regions such as the ASEAN and SAARC regions.

Over the past four decades, FDI has fostered the formation of new core regions and further promoted employment in Eastern China—that is, rather than in Central and Western China. However, no strong evidence exists showing trickle-down effects from Eastern China to nearby provinces situated in Central or Western China. The provinces benefitted more from the spillover effects resulting from China's growth poles than provinces and municipalities that have less favorable geographical locations, fewer extensive linkages between local firms, and weaker institutional capabilities and capacities. Such localization effects generated by FDI flows resemble, one might say, small water drops striking a water's surface. Ripples may spread, but the effects remain confined to the nearby area.

Past theories expected FDI to generate trickle-down effects across domestic regions. Our findings, however, show the transient impact of most FDI—in essence, FDI can develop the host region's economies to a certain extent but it moves away when production cost rises, and is not able to generate a big wave cascading to other provinces and regions, the so-called trickle-down effects used in this paper. Furthermore, contrary to conventional views of regional development, the adoption of growth pole strategy in China cannot ultimately bring about regionally balanced development or employment opportunities across China. From 2000 to 2016, our findings show that, in fact, FDI flows may even aggravate imbalanced development among China's three macro-regions.

All these findings show the ever-transient movement of FDI, which is spatially selective and biased, always moving and seeking out low-cost manufacturing bases as well as profitable markets.

Largely precipitated by global FDI flows, regional development represents an ever-polarizing process. This type of FDI concentrates development in one area (the growth pole), and, later, leaps over to another area abroad. These flows result in a distinctive spatial pattern of polarizing and imbalanced development. Akin to water, FDI flows while being directed and controlled by the channels and obstacles of policy, and, also, by the topography of the landscape (Clark, 2005). In contrast to Mydral's (1957) view, less developed countries—such as China and Southeast Asia—do not exhibit regional development trickling down from a growth pole.

6 | TOWARD A NEW THEORY OF REGIONAL DEVELOPMENT?

Drawing upon the above research findings, we find a profound and new pattern and strategy for regional development—the *leapfrog pattern and polarization strategy*, which is triggered and driven by the overwhelmingly dominated globalizations forces FDI. As a synthesis or extension of the conventional theories in the1950s (Perroux's "growth poles," Myrdal's "circular and cumulative causation" and Hirschman's "polarization" theories) and more recent theories, including Dunning's eclectic paradigm of FDI, Akamatsu's flying-geese model and Krugman's new economic geography theory, the ever-transient FDI prompts ever-polarizing regional development, leaping from one region to another, gravitating toward areas of lower cost production, often toward coastal or port-orientated areas, rather than inland regions due to the low transportation cost of sea-shipment. At first, a region chooses some key industries, which act as drivers of economic development. Once the region is upgrading into more complex industries and moving up the ladder of industrial development, the uprising labor cost drives the MNEs to find new low-cost production bases. As a large amount of FDIs flow from developed regions into many developing areas, those developing regions can establish their own labor-intensive industries and benefit from new FDI inflows.

As a strategy, the *leapfrog* pattern methodology shows the dynamics of this process as follows. First, FDI drives regional development. Such highly mobile FDI can help speed the endogenous growth of a region, while stimulating its indigenous capabilities. Second, such transient FDI has only a finite impact on a region's development. Third, a region solely relying on either FDI or its own local conditions may not successfully develop its economy. Fourth, in contrast, regions able to attract FDI and wholly use their own indigenous capabilities may grow quickly. If the region can ultimately initiate a self-reinforcing agglomeration, the progressive spatial concentration of economic activities will gradually strengthen regional development. Fifth, hinterlands may benefit from spillover effects that emanate from core regions. However, such benefits usually remain limited in scope and scale, so trickle-down effects seldom occur. Sixth, FDI will repeatedly leap from higher cost regions, landing in lower cost regions and causing regional imbalances by polarizing growth. Leapfrogging may occur within a country or a region with FDI flows shifting from, for example, the PRD to the YRD or the BHR; and also across countries or regions—for instance, from China to the ASEAN and/or SAARC regions, but seldom like a big wave cascading to surrounding regions. Relative to other regions, a regional economy's performance depends on its indigenous capabilities. These capabilities rely on a broad range of institutional reforms and support, including political reform, educational reform, and investment in research and development. However, these topics are beyond the scope of this paper.

Our study casts new light on the debate about conventional regional development theories. Endogenous growth scholars have widely focused on factor endowments, human capital accumulation, innovation capabilities, learning by doing, and institutional environments as the drivers of regional development. Other scholars have focused on exogenous factors such as demand for industrial

exports and FDI. Both approaches provide the underpinning for a theory about regional development. However, our proposed *leapfrog polarization pattern and strategy* recognizes how FDI and the indigenous capabilities of a specific region can, together, critically influence local development.

As highlighted by Henderson, Appelbaum, and Ho (2013), the new and specific form of globalization with Chinese characteristics will remarkably impact the development models of developing countries—particularly, in South and Southeast Asia. As such, our results yield practical advice for local government officials in ASEAN and SAARC countries. But these officials should not expect FDI flows to generate sustainable local development. That is, these countries should use their own local conditions to complement FDI's effects in energizing their respective local economies. In essence, similar statistical methods and empirical research may help guide policy makers, while serving as a reference for other governments.

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ENDNOTES

[1]The ASEAN comprises Vietnam, Philippines, Indonesia, Brunei, Malaysia, Cambodia, Thailand, Laos, Myanmar, and Singapore.

[2]The SAARC encompasses Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

[3]According to the Seventh Five-Year Plan (1986–1990), Eastern China consists of Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi, and Hainan. Central China comprises Heilongjiang, Jilin, Inner Mongolia, Shanxi, Henan, Anhui, Hubei, Jiangxi, and Hunan. Western China covers Xinjiang, Gansu, Qinghai, Ningxia, Shaanxi, Tibet, Sichuan, Chongqing, Guizhou, and Yunnan.

[4]Due to the limitations of various data sources, the sum of FDI inflows calculated from *Chinese Provincial and Municipal Statistical Yearbook* are different from those extracted from the United Nations Conference on Trade and Development (Lai, 2002; Zhao & Tong, 2000; Zhao & Zhang, 2007).

[5]In this study, we apply the Lagrange multiplier as well as likelihood ratio tests to check whether or not the assumption(s) of constant effects is valid, and the Hausman specification test has been performed to identify which model—FE or RE—is better. The analysis results of three tests support and indicate that the POLS model is found to be more appropriate over the FE and RE models, which indicates that the assumption of a common slope for various panel groups in pooled regressions is valid.

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