

Network Linkages and Local Embeddedness of Foreign Ventures in China: The Case of Suzhou Municipality

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WEI Y. H. D. Network linkages and local embeddedness of foreign ventures in China: the case of Suzhou municipality, *Regional Studies*. This paper analyses foreign direct investment (FDI) in Suzhou Municipality, China, known for the Sunan model of development based on township and village enterprises. Suzhou has been remaking its development model by attracting FDI and making itself an innovative place. It is argued that local states play an important, yet diminishing, role in FDI location, with the rising significance of agglomeration effects. However, foreign ventures tend to network among themselves. They remain thinly embedded with local economies and strategic coupling rarely exists. Four mismatches – technological, structural, institutional and spatial – are proposed to explain this weak embeddedness. Suzhou's development path requires expansion of endogenous capacities.

Foreign investment Global production network Embeddedness Regional development Suzhou, China

WEI Y. H. D. 中国的网络联结与外资企业的在地镶嵌: 苏州市的案例, 区域研究。本文分析中国苏州市的外商直接投资 (FDI), 该模式以根据乡镇企业发展出的“苏南发展模式”而闻名。苏州透过吸引外商直接投资, 并将自身转化成创新的地方, 重塑自身的发展模式。本文主张, 随着产业聚集的效应日益显著, 地方政府在外商直接投资的区位中扮演着相当重要却逐渐削弱的角色。但外资企业倾向在彼此之间建立关系网络。它们薄弱地镶嵌于地方经济之中, 而策略性的接合则几乎不存在。本文将提出在技术、结构、制度与空间四大方面的不协调, 解释此一镶嵌薄弱的原因。苏州的发展路径必须扩展内生的能力。

外商投资 全球生产链 镶嵌 区域发展 中国苏州

WEI Y. H. D. Le réseautage et l'intégration locale des entreprises à capital étranger en Chine: étude de cas de la municipalité de Suzhou, *Regional Studies*. Cet article cherche à analyser l'investissement direct étranger (Ide) dans la municipalité de Suzhou en Chine, reconnue pour le modèle de développement Sunan fondé sur des entreprises communales et villageoises. Suzhou a reconstruit son modèle de développement en attirant l'Ide et en se faisant un emplacement innovateur. On affirme que les états locaux jouent un rôle important, mais d'une importance décroissante, dans le choix d'emplacement pour ce qui est de l'Ide, au fur et à mesure de l'augmentation de la portée des effets d'agglomération. Cependant, les entreprises à capital étranger ont tendance à réseauter entre elles. Elles sont toujours très peu intégrées dans les économies locales et le couplage stratégique existe à peine. Quatre disparités – technologique, structurelle, institutionnelle et géographique – sont proposées afin d'expliquer cette intégration faible. Le sentier de croissance de Suzhou nécessite le développement des capacités endogènes.

Investissement étranger Réseau de production mondial Intégration Aménagement du Territoire Suzhou, en Chine

WEI Y. H. D. Netzwerkverbindungen und lokale Einbettung von ausländischen Unternehmen in China: der Fall der Gemeinde Suzhou, *Regional Studies*. In diesem Beitrag werden die ausländischen Direktinvestitionen in der chinesischen Gemeinde Suzhou untersucht, die für das auf städtischen und dörflichen Unternehmen basierende Sunan-Entwicklungsmodell bekannt ist. Suzhou hat sein Entwicklungsmodell überarbeitet, indem es ausländische Direktinvestitionen angezogen und sich selbst zu einem innovativen Ort gemacht hat. Es wird argumentiert, dass lokale Staaten eine wichtige, jedoch abnehmende Rolle für den Standort von ausländischen Direktinvestitionen spielen, während die Bedeutung von Agglomerationseffekten zunimmt. Allerdings neigen ausländische Unternehmen dazu, nur untereinander Netzwerke zu bilden. In die lokale Wirtschaft werden sie nur in geringem Umfang eingebettet; eine strategische Kopplung kommt nur selten zustande. Zur Erläuterung dieser schwachen Einbettung werden vier Diskrepanzen ins Felde geführt, nämlich im technischen, strukturellen, institutionellen und räumlichen Bereich. Der Entwicklungspfad von Suzhou erfordert eine Expansion der endogenen Kapazitäten.

Ausländische Investitionen Globales Produktionsnetzwerk Einbettung Regionalentwicklung Suzhou, China

WEI Y. H. D. Vínculos de redes e integración local de empresas extranjeras en China: el caso del municipio de Suzhou, *Regional Studies*. En este artículo analizamos la inversión extranjera directa (IED) en el municipio de Suzhou, China, conocido por su modelo Sunan del desarrollo basado en empresas situadas en ciudades y pueblos. Suzhou ha rehecho su modelo de desarrollo al atraer la IED y hacerse un lugar innovador. Argumentamos que los Estados locales desempeñan un papel importante, si bien disminuyendo, en la ubicación de la IED, con un aumento de la importancia de los efectos de aglomeración. Sin embargo, las empresas extranjeras tienden a interconectarse entre ellas. Siguen escasamente integradas en las economías locales y pocas veces ocurren conexiones estratégicas. Proponemos cuatro incompatibilidades –tecnológica, estructural, institucional y espacial– para explicar esta débil integración. La vía de desarrollo de Suzhou requiere la expansión de las capacidades endógenas.

Inversión extranjera Red de producción global Integración Desarrollo regional Suzhou, China

JEL classifications: O18, P25, R5, R11, R58

INTRODUCTION

To attract foreign investment and promote economic development, regions have become more active in exploiting their location and structural advantages. They have established a range of institutions with varied forms, including foreign investment or tax-free zones, to attract foreign direct investment (FDI). Policy incentives influence the location decisions and network relations of transnational corporations (TNCs). TNC local embeddedness is considered essential to benefit from TNC trickle-down effects and makes regions resilient to global ‘shocks’. Without sufficient embeddedness, TNCs could make developing regions dependent on the developed world and expose them to global capital flight and financial risk. Therefore, questions about TNC networks and embeddedness arise from the research on globalization and places/regions, as well as the role of institutions. However, global-local networks and their effects on regional development remain inadequately explored. As a top recipient of FDI, China provides a great opportunity for a more detailed understanding of the network structure of TNCs through an investigation of their subsidiaries, or foreign-invested enterprises (FIEs), as they are typically called in China.

This paper investigates the network structures of foreign ventures in Suzhou municipality, which is part of Sunan (Southern Jiangsu Province). The municipality consists of the seven districts (Suzhou city for simplification) and five county-level cities: Changshu, Zhangjiagang, Kunshan, Taicang and Wujiang. It was previously known for the Sunan model of development based on local state-directed township and village enterprises (TVEs). However, Sunan has been remaking its development model through state-centred efforts to attract FDI and make Sunan an innovative place (WEI *et al.*, 2009, 2011). TNC networks/linkages influencing regional development are backward-forward linkages and research and development (R&D) or innovation networks (YOUNG *et al.*, 1994), which will be examined in this paper. While this paper’s focus is on FIEs-local networks, location choice is the precondition for the realization of FDI and the formation of networks, and

so it must also be investigated. The information and communication technology (ICT) industry was targeted for its important role in global linkages and the growth of the Chinese economy.

Embeddedness has different directions (for example, horizontal and vertical), types (for example, social, cultural, structural, technological and political), and dimensions (for example, societal, network and territorial) (HESS, 2004). FDI local embeddedness is considered here as a concept closely linked to FDI local networks, which can be described as the nature, depth and extent of a foreign venture’s ties to the local environment. The focus is on FDI economic/structural and technological embeddedness, especially in production, market and R&D activities, at both the network and territorial dimensions. The following research questions were asked:

- What are the structural characteristics of FIEs’ network relations?
- How locally embedded are FIEs in terms of supplies, markets and innovation activities?
- What are the implications of FDI local networks on regional development?

The ways in which forces of global capital intersect with China’s regions at the sub-national scale were analysed, the aim being to gain a nuanced understanding of industrial and regional development in China. It is argued that FIEs in China are gradually localizing their production, but the extent of local embeddedness remains limited. FIEs also tend to network among themselves, making Suzhou an FIE satellite district.

THEORETICAL AND CONTEXTUAL ISSUES

The process of globalization is characterized by a restructuring of the global production chain, including the relocation of low-end production functions to developing countries to tap the pool of cheap labour, while control and innovative functions are retained in advanced economies. The increased mobility of global capital and infusion of FDI into developing countries are seen as parts of the global restructuring story.

However, theories of hyper-globalization, including the New International Division of Labor theory, tend to exaggerate the importance of labour costs in production. They underestimate the complex process of decision-making and the role of regions and institutions in global economic restructuring (SAYER, 2004). Geographers in particular have argued that the global economy is not a singular world economic system, but a regional world of production contested by localization, regionalization and deterritorialization (STORPER, 1997; SCOTT, 1998).

While new regionalism has been emphasizing local assets and endogenous networks in the development of technopoles and regions (STORPER, 1997), recent scholarly work has called for 'globalizing', or 'scaling up' regional development (COE *et al.*, 2004; WEI *et al.*, 2007). Scholars point to the importance of external agents and networks in creating technological dynamism and enhancing regional development (SAXENIAN and HSU, 2001; BATHELT *et al.*, 2004; SIMMIE, 2004; WOLFE and GERTLER, 2004). The global production network (GPN) perspective emphasizes the role of GPNs driven by leading global TNCs and promotes strategic coupling with these firms (YEUNG, 2009). However, GPN research falls short in explaining how regions actually translate ties to global markets into local development outcomes (MURPHY and SCHINDLER, 2011).

FDI-local networking and embeddedness are contingent on a number of factors, including the TNC home-country effect and the host-TNC relationship, as well as host and local environments. Research has found that TNC strategy, corporate hierarchy, and country sources affect localization and embeddedness (WEI *et al.*, 2012). Geographical dispersion of TNC manufacturing has been a central feature of globalization, and TNCs' branch plants tend to be territorially disembedded to some degree to take advantage of locational differentials (PERKMANN, 2006). In some cases, TNCs actively seek localization and embed themselves within local economies. This could be due to the consideration of cost reduction resulting from agglomeration economies with improved local labour markets, regional innovation systems and local supplier networks. Increasingly, TNCs localize production to penetrate local/domestic markets and satisfy the needs for customized and localized products (market seeking strategy), while maintaining core corporate functions, especially R&D and global management at home. When TNCs seek to exploit the network reach and power of indigenous enterprises in host markets, global-local networks tend to be strong, and the effect on regional development may be quite positive. The large number of FIEs concentrated in the Yangtze River Delta (YRD) has made this region capable of providing high-quality production components and parts. To adapt to local institutions and demands, TNCs may also seek localization through hiring local people for key marketing and

management positions. Taiwanese firms are known for network production among themselves and strategic coupling with global TNCs, while politically and culturally they are well-embedded within local economies (WANG and LEE, 2007; YANG, 2009).

Institutional factors can play an important role in influencing the structural or network decisions of TNCs. The mobility and bargaining power of TNCs across the global scale contrasts with the relatively fixed territories of local states, creating an asymmetric TNC-state relationship. The capability of states to envision their development paths and to bargain and interact with TNCs is crucial in shaping the structural or network characteristics of FDI (KAMINSKI and SMARZYNSKA, 2001). The Chinese state maintains certain bargaining power with TNCs, given the state ownership of land and the increasing purchasing power of domestic markets, especially in the earlier period of reform when China was only partially opened up for FDI and key sectors, such as automobiles, required large tracts of land (YEUNG and LI, 1999). This is evidenced by the local content requirement and strong embeddedness of the automobile industry in Shanghai (SIT and LIU, 2000), as exemplified by the development of Volkswagen's supply networks in Shanghai (DEPNER and BATHELT, 2005). However, with China's entrance into the World Trade Organization (WTO) in 2001, local content requirements have been phased out. Today states are increasingly relying on other instruments to protect their markets and enhance competitiveness, such as non-tariff barriers, developing endogenous capacities and investing abroad. Most local states do not have bargaining power with TNCs. They attempt to provide better infrastructure and services to lure foreign capital. Local states thus play an active role in transforming local institutions to fit the needs of foreign firms, which can even be described as 'strategic coupling' (WANG and LEE, 2007). TNCs tend to have an increasing number of options in location decision-making, depending on business organization, strategic considerations and local conditions.

Regions with strong local capacities and participation of TNCs in global-local networks tend to develop 'thick' global-local ties and generate superior results in innovation and technological progress, such as the case of Bangalore, India, with its active participation of TNCs, in comparison with Bandung, Indonesia, which focuses on domestic actors and markets (FROMHOLD-EISEBITH, 2002; ZHOU and WEI, 2011). It is not only strong indigenous capacities, such as strong local states, domestic firms, universities or research institutions, but also interaction with TNCs that is essential for fruitful innovation and technological linkages. Participation in global production networks, as practised by East Asian NICs such as Taiwan, also can multiply linkages (HOBDAI, 2000; COE *et al.*, 2004). ZHOU and TONG (2003) argue that the success of the Zhongguancun Science Park in Beijing relies on the

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interdependence between TNCs and local firms and that the reliance on external technology does not necessarily diminish the importance of local networks and institutions in promoting technology change. KIM and ZHANG (2008) provide another case of network development driven by the strong ability of local firms to create global–local networks in Qingdao. In both cases, production networks are driven by powerful and large firms based in China, through a process of scaling up development.

However, in many developing countries global–local networks tend to be thin and dependent, as evinced by the satellite industrial platforms in Central and Eastern Europe in the 1990s, the so-called ‘Cathedrals in the Desert’ (for example, GRABHER, 1994; HARDY, 1998); the widespread weak integration of local firms with TNCs’ production networks in Latin America (for example, LOWE and KENNEY, 1999); and the dominance of quiescent or branch plant-like subsidiaries, rather than developmental firms, in the Asia Pacific region (POON and THOMPSON, 2003). Cases of limited regional spillovers are widely acknowledged in Asia (for example, SAJARATTANOCHOTE and POON, 2009). When TNCs operate in isolation from local economies with little absorptive capacity, their potential contribution to industrial upgrading is not realized, as in the case of Vietnam (VIND, 2008). The local effect may be limited and confined to subsequent inflows of follow-the-leader FDI in the absence of necessary indigenous support capability and corresponding local state intervention (LEAHY and PAVELIN, 2003).

It is well documented that TNCs strive to maintain technological advantages and are not willing to transfer core technology to developing countries (DICKEN, 2003). They tend not to agglomerate with domestic companies, as they perceive potential knowledge inflows to be lower than potential leakages (MARIOTTI *et al.*, 2010). Scholars are widely aware of developing countries’ dependence on imported technology and foreign affiliates, which greatly limits their innovation activities and technological progress (LOWE and KENNEY, 1999). FIEs in China tend to engage in product and process development for the Chinese market, while little improvement can be observed in basic R&D. Some observers question China’s approach to technological exchange for the domestic market (HUCHET, 1997; LEMOINE and UNAL-KESENCI, 2004, SUN, 2002). However, others consider China’s strategy of ‘markets for technology’ effective. In fact, China has risen as a major knowledge producer, competing directly with lead TNCs in the ICT sector (ZHOU and LEYDESDORFF, 2006).

TNCs tend to network among themselves, forming ‘glocal’ networks of TNCs (JENSEN, 2004), that is, network embeddedness without territorial embeddedness. Taiwanese firms have used relational (*guanxi*) assets, coupling with local states, and just-in-time (JIT) logistics for their investment in China, leading to

pseudo-embeddedness (YANG, 2007; YANG and HSIA, 2007). Integration of domestic firms with global value chains or global production networks rarely exists in developing countries. In this situation, the effects of TNCs on the local economies are limited, mostly in the form of job opportunities, and to a lesser extent tax contribution.

This paper investigates network configurations, specifically localization or embeddedness, of FIEs in Suzhou. The notion of embeddedness emphasizes linkages between foreign ventures and domestic firms in production and R&D activities. Based on the above literature review and the Chinese context, a number of propositions or arguments have been formulated to guide this research: First, the structure of FIEs is analysed and it is argued that local agglomeration has become increasingly important in TNCs’ location decisions and network formation. Second, the forward and backward linkages of FIEs are specifically investigated, and it is hypothesized that the region has a weak localization level. It is argued that it is global capital that largely determines the network linkages and the extent of localization. Last, it is argued that the factors underlying local embeddedness are multifaceted, including technological, institutional, structural and spatial dimensions.

DATA AND METHODOLOGY

The author mobilized a team of highly experienced researchers and deployed a combination of qualitative and quantitative methods, including the quantitative analysis of questionnaire surveys and interviews of local governments and firms. The data were drawn from a survey of the ICT industry in Suzhou in spring 2007 (hereafter The ICT Survey or the surveyed ICT firms), including both domestic and foreign firms, conducted by a highly professional national survey firm affiliated with the State Statistical Bureau (SSB) of China (ZHOU *et al.*, 2011). The sample size represented 5% of the ICT firms in Suzhou that were found in the SSB’s relatively complete list. The survey followed a standard procedure and was conducted by a mix of telephone calls and on-site visits, which usually took one to one-and-a-half hours to complete, with an estimated effective response rate of 12–15%. Such a return rate is comparable with other similar surveys in China and other developing countries in Asia (SCOTT, 1998; POON and THOMPSON, 2003). The author also statistically tested the representativeness of the survey data and found that the surveyed firms were, in general, representative of the surveyed firms. The survey reached 160 hardware firms, including 108 FIEs and forty-nine domestic Chinese firms. Three firms with 2005 data from the pilot testing were excluded. This dataset, especially the sub-dataset of the 108 FIEs, was the major data source for this paper.

SUZHOU'S PATHWAYS TO DEVELOPMENT

Suzhou is an ancient capital of China and was one of the pre-industrial world's great cities. However, its status in the YRD and the Chinese economy has been supplanted by Shanghai since the First Opium War in the 1840s. During Mao Zedong's era, Suzhou city was transformed to a socialist productive/industrial centre dominated by state-owned enterprises (SOEs), while limited rural industries were established in the countryside. With the launch of the reform, TVEs, as a semi-state but market-oriented form of ownership, blossomed in Sunan in the 1980s, achieving such success as to win national recognition collectively as the Sunan model of development (MA and FAN, 1994). However, with the onset of the open door policy and privatization, TVEs, troubled by problems of fuzzy property rights, failed in competition with TNCs and private enterprises. They were largely privatized, which signalled the end of the classic Sunan model of development.

From the opening up of the YRD in the early 1990s, attracting FDI has been the central element of Suzhou's policy initiatives, the leading examples of which are the China-Singapore Suzhou Industrial Park (CSSIP), the Suzhou New District centred on Suzhou High-Tech Zone (formally, Suzhou New and High-Tech Zone), and the Kunshan Economic and Technological Development Zone. The most prominent measure Suzhou took was the establishment of the CSSIP in 1994, a 'software transfer' programme (PEREIRA, 2003) jointly run by Chinese and Singaporean government-backed consortiums. The development of the CSSIP is the product of multi-scalar interplay among different states, including the Singaporean government (through its global reach strategies and regional industrialization programme), the central government of China and the local governments of Jiangsu province (WEI *et al.*, 2009). However, the development of CSSIP has not been a smooth process; it had been troubled by local protectionism and competition (with Suzhou High-Tech Zone) and hit by the Asian financial crisis in the late 1990s. Singapore relinquished its majority control and the Chinese consortium took over the majority control (65%) in 2001.

Despite the difficulties Suzhou quickly emerged as a major destination of FDI and manufacturing centre (DOLVEN, 2001), especially as a hub of the ICT industry specializing in notebook computers and semiconductors. FDI in Suzhou city has risen dramatically since the early 1990s, reaching US\$2.8 billion in 2006, making FIEs the leading ownership form. By 2006, Suzhou city realized a cumulative total of US\$16.3 billion in FDI. FIEs had total exports and imports of US\$88.8 billion in 2006, which amounted to 94.7% of Suzhou's total exports and imports. Suzhou Industrial Park is the leading development zone in attracting FDI. In 2006, it had FDI of US\$1.60 billion, which was

57.1% of the city's total (SSB, 2007). The municipality has become one of the richest in China.

However, Suzhou's development path has generated new concerns over the social, developmental and environmental costs. Also, Suzhou's resilience is questionable in the face of the global financial crisis and capital mobility. Foreign control of the economy is a major concern, especially the dominance of Taiwanese original equipment manufacturers (OEMs) (CHIEN, 2007; WEI, 2010). With the relaxation of financial controls and the maturation of the investment environment, wholly foreign-owned enterprises (WFOEs) have become the dominant form of investment, accounting for 88.0% of the total in 2006. Taiwanese investment has been the major source of FDI in Suzhou since the mid-1990s, followed by Hong Kong, the United States, Japan and Singapore.

TNCs' PROFILES AND LOCATION DECISIONS

Suzhou's economy is driven by the ICT sector, which is the major recipient of FDI. Taiwan was the home of 73.5% of the surveyed FIEs, followed by Japan (12.2%). None of the surveyed FIEs had their headquarters located in Suzhou. With respect to ownership structure, 94.4% of the surveyed FIEs were WFOEs, which is somewhat higher than the norm for cities in China. With regard to sector composition, the surveyed FIEs were primarily in electronic parts and components (46.3%) and computer equipment manufacturing (26.9%). In terms of firm size, a substantial proportion of the FIEs had investments of US\$1-5 million (38.9%), but 23.1% of the FIEs were also found to have an investment size over US\$25 million, which indicates a bipolar size distribution of FIEs. Evidence of the labour-intensive nature of FIEs is also indicated by the survey, with 44.5% of firms employing more than 500 workers. The nature of FDI in the ICT sector in Suzhou can be summarized as follows: most firms are WFOEs headquartered in Taiwan; there is a bipolar size distribution; and production is labour intensive.

Based on the survey, it was found that market access and the cost of labour play the most significant role in the decision of foreign ICT firms to invest in Suzhou, followed by infrastructure and investment incentives (Table 1). These factors are also often mentioned by investors considering investing in China. Compared with other cities, especially Shanghai and Hangzhou in the YRD, FDI in Suzhou is even more export oriented, and Suzhou sees less expensive labour costs while maintaining decent labour quality, implying the significance of the labour factor. As part of the YRD and with a location close to Shanghai, Suzhou also has good access to markets and ports, especially Pudong International Airport and Shanghai Port, while at the same

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Table 1. Location decision factor scores of the surveyed foreign-invested enterprises (FIEs)

Factors for investing in Suzhou	Scores	Factors for an intra-urban location	Scores
<i>Local states/infrastructure</i>			
Better investment incentives	101	Better investment incentives	168
Better attitude toward FDI	20	Better attitude toward FDI	157
Better infrastructures	122	Better industrial infrastructures	224
Better urban amenities	32	Sophisticated and efficient administration	37
Professional service	27	Advised/requested by municipal government	34
University and research institutions	4		
<i>Labour and supplies</i>			
Lower labour cost	251	Lower land cost or land use fees	209
Better availability of skilled labour	178	Better land availability	167
Better access to material supplies	165	Location of Chinese parent firms	25
<i>Location and market access</i>			
Better local/regional market potential	204	Closer to downtown	209
Closer to major seaports/airports	180	Closer to seaports or airports	118
Location of major customers	178	Closer to major customers	247
Agglomeration of similar enterprises	176		

Notes: FIEs were asked to identify and rank five of the most important location factors, which were given scores of 5, 4, 3, 2 and 1; the higher the total score, the more important the factor.

FDI, foreign direct investment.

Source: The ICT survey.

time avoiding the high production costs in Shanghai associated with labour, land and fees.

Compared with a 2003 survey of FIEs (WEI *et al.*, 2009), two major changes in terms of location decisions were found. First, the role of state policies in location decisions has over time become less significant for the ICT firms. China's investment policies have gradually been standardized across cities in the YRD, and the government now discourages intense local competition for FDI through 'racing to the bottom'. Institutional reforms in neighbouring cities have also reduced the policy advantages Suzhou enjoyed. Moreover, in comparison with manufacturing investment, FDI in the ICT sector tends to focus more on human resources and access to markets. During the author's interview Suzhou officials also stressed the fact that Suzhou no longer has advantages in land and incentives, and they must improve access, infrastructure, supporting industries and government services. This position of the Suzhou government is also an indication of its knowledge about FDI and its ability to adapt to change, in contrast to the focus of earlier years on providing policy incentives, especially cheap land and infrastructure, a common practice among Chinese cities (for example, CHIEN, 2007; WEI *et al.*, 2010).

Second, with years of investment and construction in Suzhou, foreign investors see the advantage of Suzhou in terms of industrial clustering/agglomeration and infrastructure. This is evident from high scores in the items of location of major customers, agglomeration of similar enterprises and better access to material suppliers. The interviews confirm the rising significance of industrial clustering and agglomeration in FIEs' decision to invest in Suzhou and in the relocation of Taiwanese firms from the Pearl River Delta (PRD) to Suzhou.

This finding is consistent with studies on the agglomeration effect on the relocation of FDI in the PRD to Suzhou (YANG, 2009). The locational advantage of Suzhou also allows firms in the city to use advanced business services provided by Shanghai, which has contributed to the slow development of the service sector in Suzhou and the outflow of the highest end professionals to Shanghai.

In terms of intra-urban location decisions, the survey indicates that closeness to major customers stands out as the single most important factor in a location (Table 1), which can be attributable to the requirement of the ICT industry for clustering and swift delivery, for reasons of cost, speed and flexibility. The presence of well-established local and regional marketing networks, due to industrial clustering and the proximity to major seaports and airports in Shanghai, clearly adds to the appeal of the location. The ICT industry is heavily dominated by Taiwanese firms, which tend to cluster in space, and their export orientation also requires a location with easy access to the international market (WANG and LEE, 2007; YANG, 2007).

Better industrial infrastructure, partly provided by local governments, is found to be the second most important factor in location decision, followed by lower land cost or land use fees, which reflects local state policies. Therefore, better investment incentives, better land availability and a better attitude toward FDI, all attributes of local state institutions, remain important factors in decisions about intra-urban location. It was concluded that industrial clustering and the local state institutions were the most important determinants of intra-urban location decisions, although the role of the local state has become less significant.

FDI location decisions in Suzhou have important theoretical and policy implications. First, the main location factors are a complementary combination of conventional neoclassical variables (for example, labour, infrastructure) and new institutional perspectives (for example, states, networks) (WEI *et al.*, 2010). Second, the role of the state in location decisions changes with time and context, which supports the notion of the Chinese state as a transitional institution. While FDI in China was attracted by preferential policies, recent policy convergence across cities and ownership forms has reduced the significance of state incentive policies in location decisions. Last, local agglomeration or networks within (emerging) global city regions have become a powerful force in FDI location decisions, proving the pervasiveness of the force of agglomeration (SCOTT, 2006).

TNCS' PRODUCTION NETWORKS AND LOCAL EMBEDDEDNESS

The above analysis indicates that Suzhou is a manufacturing floor for TNCs, with headquarters located mainly in Asia, especially Taiwan. The functions of headquarters and marketing were very limited in Suzhou, and most of the surveyed FIEs serve as regional or global manufacturing nodes within their corporate hierarchy/networks (Table 2). Suzhou's FIEs primarily provide for the Chinese market, first and foremost as production facilities, and secondarily through product and process development. Less than one-quarter of the FIEs' output is destined for the global market.

This shows that FIEs in China function as manufacturers more for the Chinese market than the world market. Not only is China's domestic market growing more important, but also FIEs in the region increasingly provide supplies to each other. The current strength of the national and regional markets contrasts with the

findings of the 2003 survey, when output for the global market nearly equalled domestic sales (WEI *et al.*, 2009).

Yet, despite the rising significance of the Chinese market, the functions of headquarters and basic research remain marginal. In this regard, the survey is consistent with the interviews of firm managers and local officials. Suzhou serves as a manufacturing node of TNCs' global networks, but in terms of TNCs' regional control functions, TNCs are more likely to place their regional administrative and R&D activities in major urban locations such as Shanghai and Beijing, rather than secondary cities such as Suzhou.

With respect to purchasing linkages, while the surveyed FIEs have broad supply bases, there were two distinct characteristics. It was found that the purchase networks are highly localized within the YRD, indicating that while TNCs are globalizing their production, they are also localizing their production networks. The surveyed FIEs had, on average, 60.2% of their materials and components purchased from the YRD (Table 3), indicating the clustering of the ICT industry in the region. Subcontracting is also concentrated in the YRD, where FIEs dominate the production of equipment and key components, while Chinese firms mainly provide peripheral parts and materials. TNCs are not localizing their production with local Chinese firms; instead, FIEs tend to purchase from each other, forming TNC networks with little participation of Chinese firms. As shown in Table 3, only 30.5% of the equipment purchased in the past three years was domestic. The foreign parent firms of the surveyed FIEs often make purchasing decisions due to strategic and quality considerations. The lower the level the FIE is positioned in the corporate hierarchy, the more likely subcontracting linkages with Chinese firms exist.

The data and firm interviews reveal that TNCs' network characteristics are also influenced by home country effects, which supports DICKEN's (2003)

Table 2. Functions of foreign-invested enterprises (FIEs) in Suzhou

Venture functions	Municipality	Suzhou city	Kunshan
Regional headquarters for China	5.6 (5.2%)	2.5 (6.4%)	1.9 (4.3%)
Regional headquarters for Asia-Pacific	3.1 (2.9%)	2.3 (5.9%)	0.1 (0.23%)
Production facility mainly for the Chinese market	42.6 (39.4%)	13.6 (34.9%)	20 (45.5%)
Production facility mainly for the world market	11.7 (10.8%)	4.5 (11.5%)	3 (6.8%)
Marketing facility mainly for the Chinese market	4.3 (4%)	1.5 (3.9%)	1.6 (3.6%)
Product development facility for the Chinese market	16.2 (15%)	5.4 (13.9%)	7.5 (17%)
Product development facility for the world market	7.7 (7.1%)	2.9 (7.4%)	3.6 (8.2%)
Process development facility for the Chinese market	12.9 (11.9%)	4.9 (12.6%)	5 (11.4%)
Basic R&D facility for the world market	3.6 (3.3%)	1.4 (3.6%)	1 (2.3%)
Others	0.3 (0.3%)	0 (0%)	0.3 (0.7%)
Total	108 (100%)	39 (100%)	44 (100%)

Notes: Numbers are total scores. A firm serving one major function has a score of 1. If a firm chooses two major functions, each function is given a score of 0.5.

R&D, research and development.

Source: The ICT survey.

Table 3. Production networks of foreign-invested enterprises (FIEs)

	Domestic purchase as a percentage of the total purchase	44.4
775	Percentage purchase from domestic Chinese firms	37.7
	Percentage purchase from all firms within a two-hour driving distance	49.0
	Percentage purchase from all firms in the Yangtze River Delta	60.2
	Key components purchase: % from FIEs	51.6
780	Equipment purchase in the most recent three years: % domestic	30.5
	<i>Subcontracting of FIEs (%)</i>	
	Percentage subcontracting from the local (within a two-hour driving distance)	54.3
785	Percentage subcontracting from the Yangtze River Delta	67.0
	Percentage from FIEs	48.1
	<i>Subcontracting to FIEs (%)</i>	
	Percentage subcontracting to the local (within a two-hour driving distance)	41.8
790	Percentage subcontracting to the Yangtze River Delta	76.9
	Percentage to FIEs	39.0

Source: The ICT survey.

argument for the significance of home country effects despite globalization. It was found that TNCs based in the United States and Europe had broader supply bases and more localized production than other countries. They also tended to use Chinese people more frequently in key management positions, sometimes even as general managers. Human development has become the largest contribution of TNCs to the development of high-technology industry in China. Japanese firms have also increased their localization efforts in recent years. Similar trends can be observed among firms based in South Korea. But FIEs based in Japan and South Korea still tend to be more tightly controlled by their headquarters and tend to network with FIEs with the same country origin. Firms based in Taiwan were also less localized, although Taiwanese firms were politically and culturally well embedded in Suzhou (CHIEN, 2007; WANG and LEE, 2007). Taiwanese firms function as manufacturers for the Chinese and world markets. Their lead firms and suppliers tend to network among themselves, and domestic firms in Suzhou have very few linkages with them, which will be explained in more detail below. FIEs in Suzhou are, therefore, not deeply embedded in the existing purchasing networks of Chinese domestic firms.

In terms of forward linkages, it is surprising that FIEs significantly focused on the Chinese market (Table 4). This challenges the conventional wisdom that FIEs in China are export oriented, which was true in earlier years of FIE development in China. But with the rise of the Chinese economy and the slow growth of the international market, FIEs have gradually shifted their functions from production for the international market towards penetrating the Chinese market, while

Table 4. Marketing Activities of foreign-invested enterprises (FIEs)

	Percentage export	43.5	
	Percentage export directed by FIEs' parent firms	57.8	
	Percentage domestic sales directed by FIEs	74.1	830
	Percentage domestic sales, among which:		
	Percentage domestic firms	26.3	
	Percentage Yangtze River Delta	49.8	
	Among which, % FIEs	44.9	
	Percentage Pearl River Delta	7.9	835

Source: The ICT survey.

continuing to export. FIEs have been further diversified among export orientation, domestic orientation and dual orientation. The data show that FIEs had significantly higher export rates than domestic firms, since 40.7% of surveyed FIEs had export rates higher than 50%. A dualistic structure is being formed regarding marketing decisions between parent and subsidiary firms. FIEs' parent firms play an important role in decision-making concerning exports. The foreign parents generally give the FIEs with a Chinese market focus a low to medium level of decision-making autonomy. This represents an increase in subsidiaries' decision-making authority, which indicates that the Chinese market has become more important.

The local agglomeration of TNC subsidiaries forms an important part of FIEs' domestic market. At the national level, 53.7% of the surveyed FIEs had more than half of their sales coming from other FIEs in China. The YRD accounted for 49.8% of the sales to the domestic market (Table 4). While an observation period of three years is short, the interviews with both foreign and Chinese firms do confirm the limited improvement over production localization in Suzhou. More firms experienced a significant increase of key component purchase from FIEs than a significant decrease (Table 5). Subcontracting linkages seem stable, and FIEs' significance in local subcontracting relationships even increased. Yet, on the whole TNC-local firm production networks appear to have weakened during 2003–2006, and the Suzhou region's status as a satellite district persisted.

For domestic firms, the change in production and marketing behaviours in 2003–2006 was even smaller than those of FIEs, with slightly more firms experiencing an increase in imports and a decline in domestic purchasing (Table 6). The most significant increase was in purchasing and subcontracting from FIEs, reflecting the rising importance of FIEs in Suzhou municipality. But overall, the network linkages of domestic firms with FIEs changed very little in the 2003–2006 period. The Suzhou case shows the increasing significance of industrial agglomeration in FDI location and the formation of TNCs' own 'glocal' networks in production.

Table 5. Change of foreign-invested enterprises' (FIEs) external linkages in Suzhou Municipality, 2003–2006

Proportion of:		Number of firms		Significant increase		Significant decrease		Not much change		
885	Imports	108	100%	13	12.0%	14	13.0%	81	75.0%	940
	<i>Domestic purchase</i>	108	100%	13	12.0%	15	13.9%	82	75.9%	
	From FIEs	108	100%	14	13.0%	17	15.7%	77	71.3%	
	<i>Domestic key components</i>									
	Purchase from FIEs	108	100%	15	13.9%	3	2.8%	90	83.3%	
890	<i>Subcontracting from FIEs</i>									945
	Subcontracting from FIEs (%)	49	100%	10	20.4%	4	8.2%	35	71.4%	
	Percentage subcontracting from the local (within a two-hour driving distance)	49	100%	12	24.5%	1	2.0%	36	73.5%	
	Percentage subcontracting from the Yangtze River Delta	49	100%	8	16.3%	0	0.0%	41	83.7%	
	Percentage from FIEs	49	100%	8	16.3%	2	4.1%	39	79.6%	
895	<i>Subcontracting to FIEs (%)</i>	47	100%	2	4.3%	3	6.4%	42	89.4%	950
	Percentage subcontracting to the local (within a two-hour driving distance)	47	100%	6	12.8%	2	4.3%	39	83.0%	
	Percentage subcontracting to the Yangtze River Delta	47	100%	7	14.9%	1	2.1%	39	83.0%	
	Percentage to FIEs	47	100%	3	6.4%	1	2.1%	43	91.5%	

Source: The ICT Survey.

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Table 6. Change of external linkages of non-foreign-invested enterprises (FIEs), 2003–2006

Proportion of:		Number of firms		Significant increase		Significant decrease		Not much change		
905	Imports	49	100%	4	8.2%	1	2.0%	44	89.8%	960
	<i>Domestic purchase</i>	49	100%	2	4.1%	4	8.2%	43	87.8%	
	From FIEs	49	100%	7	14.3%	6	12.2%	36	73.5%	
	<i>Domestic key components</i>									
	Purchase from FIEs	49	100%	3	6.1%	1	2.0%	45	91.8%	
910	<i>Subcontracting from</i>									965
	FIEs (%)	20	100%	2	10.0%	0	0.0%	18	90.0%	
	The local (within a two-hour driving distance) (%)	20	100%	2	10.0%	1	5.0%	17	85.0%	
	The Yangtze River Delta (%)	20	100%	1	5.0%	0	0.0%	19	95.0%	
	FIEs (%)	20	100%	0	0.0%	0	0.0%	20	100.0%	
915	<i>Subcontracting to</i>									970
	The local (within a two-hour driving distance) (%)	12	100%	1	8.3%	0	0.0%	11	91.7%	
	The Yangtze River Delta (%)	12	100%	0	0.0%	0	0.0%	12	100.0%	
	FIEs (%)	12	100%	0	0.0%	0	0.0%	12	100.0%	

Source: The ICT Survey.

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TNCS' R&D ACTIVITIES AND LINKAGES WITH DOMESTIC FIRMS

925 The survey found that FIEs generally have limited R&D capacities, mainly for simple product development or quality control (Table 7). Most of the R&D personnel have bachelor's degrees or higher, and most of them were recruited domestically. Suzhou city, especially
 930 Suzhou Industrial Park and, to a lesser extent, Suzhou New District, has been more aggressive in recruitment from abroad in comparison with other cities in Jiangsu. These two development zones are among the largest national-level development zones, which tend
 935 to have higher professional standards and better integration with the global economy. Most of Suzhou's counties have not been able to recruit from abroad due to the cost. Recruiting and keeping R&D personnel

are challenging for Suzhou, given the competition in the YRD for human capital. Also Suzhou, as a prefectural-level city, has fewer national or even provincial-level research facilities for R&D personnel than provincial capitals. Finally, as regards personnel, in Taiwanese firms the chance for promotion tends to be slimmer, and there is a high turnover rate for key R&D people.

R&D spending was generally higher for FIEs than local companies. While most of the firms had little change in R&D spending between 2003 and 2006, it was noticed that a substantial proportion of them (21.3%) had a significant increase (Table 7). Overall, Suzhou shows an increase in R&D funding and personnel. While Suzhou city provides multiple sources of funding for R&D, the lack of R&D funding limits the counties' progress in technological upgrading and developing endogenous capacities, which is a major reason

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Table 7. Profiles of research and development (R&D) activities in foreign-invested enterprises (FIEs)

	Number of FIEs	%
995		
Having an R&D facility	60	55.6
Belongs to		
National R&D	1	1.7
Provincial R&D	5	8.3
Local R&D	8	13.3
Firm self	46	76.7
1000		
	Number of employees	%
R&D employee	5656	100.0
Bachelor or higher degree	4671	82.6
Recruited abroad	158	2.8
1005		
	Number of FIEs	%
Increase significantly	23	21.3
Decrease significantly	5	4.6
Little change	80	74.1

Source: The ICT Survey.

for the technological gap between FIEs and local indigenous firms.

Regarding core technology, the most important finding is that FIEs have relied mainly on foreign sources and internal development. FIEs tend to receive core technology from their headquarters (abroad), rather than from China. There is a lack of R&D cooperation between firms in Suzhou, not only among foreign and domestic firms, but also among FIEs themselves. Therefore, despite forming production and supply networks, FIEs have weak networks in R&D activities.

The interviews revealed that more advanced core technology is overwhelmingly imported from abroad, while internal development and domestic firms were mainly used to support production targeting the Chinese market. TNCs use their FIEs to conduct R&D for the Chinese market is increasing. But localization of R&D is stymied by the low quality of research at most Chinese universities. Only one firm in the study partially used domestic universities and research institutions as a source. Although elite universities have made significant strides in educational reform and technology transfer, most research institutions lag behind (WU, 2007). Most of the local branches of Chinese universities established in Suzhou provide management and training services, and few offer R&D. To compensate for the universities' shortcomings, Suzhou has established more than a dozen national-level and two dozen provincial-level incubators for R&D. Such efforts have attracted some high-technology firms to those incubators, and some have developed niches in the market. Yet, efforts to improve this sector take a long time and require the commitment of huge resources. Technological change is overwhelmingly customer driven. Since FIEs' customers are mainly other FIEs, leading global companies – Tier 1 and Tier 2 Taiwanese

OEMs/ODMs (original design manufacturers) – are in the driver's seat.

Most FIEs had little cooperation with domestic firms, especially in strategic alliances and cooperative R&D. Slightly more interaction can be found in personnel exchange, technological advising and information exchange. This finding confirms that the extent of technology transfer from FIEs to domestic firms in China is limited (HUANG, 2003). Suzhou's ambition in the development of R&D also faces intense challenges from other cities in China, especially Shanghai and Nanjing.

DISCUSSION AND CONCLUSION

Suzhou has transformed its economy, formerly burdened by state and collectively owned enterprises, into a leading information technology manufacturer of China and a gross domestic product powerhouse. Its pathway to remaking the Sunan model is a state-guided and FDI-driven process that is more radical than the bottom-up process of remaking the Wenzhou model centred on family business. When incremental reform of state-owned enterprises (SOEs) and township and village enterprises (TVEs) did not work, Suzhou chose the radical, path-shaping process of globalization to overcome institutional and structural barriers in reforming TVEs and SOEs. The local state is powerful and its decision was crucial in remaking the Sunan model. The local state continues to be indispensable in making Suzhou a competitive FDI destination. Today FIEs have become the main agent of development and production in Suzhou, and have played a critical role in reshaping the trajectories of development in Sunan. The role of government policy in FDI location decisions, although still important, is shrinking as the significance of agglomeration increases. This indicates the emergence of a global city region based on the growing production networks of the YRD.

This paper has investigated the local networks and embeddedness of FIEs in Suzhou. It found that Suzhou mainly hosts branch plants of TNCs with headquarters located outside China and with weak linkages to local economies. It also found that a large percentage of factories are assembly plants, and TNCs' local branches have little control over the making of key decisions, although they have increasing decision power regarding the Chinese market. FIEs do not think cooperation with domestic firms is necessary for R&D and innovation activities, and there is no incentive for them to embed with local economies in R&D, which is consistent with findings based on other regions of China (for example, WANG *et al.*, 2010; WEI *et al.*, 2010; ZHOU *et al.*, 2011). More significantly, TNCs have formed their own 'glocal' networks of production in the YRD, largely excluding indigenous firms in Suzhou. The linkages between FIEs and local firms

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are thin, and a trend of significantly increasing global–local linkages was not detected. Those features reflect Suzhou’s dependency on external markets, which is not surprising, given the nature of Suzhou as a largely satellite district (WEI *et al.*, 2009, 2011).

Four mismatches – technological, structural, institutional and spatial – explain the satellite nature of the city and weak embeddedness of FIEs. First, technological mismatch is a key reason for the weak embeddedness in Suzhou. The largest sector of FDI in Suzhou is the ICT sector. However, local enterprises in Suzhou city, with their origins in SOEs and TVEs, tend to be low-technology oriented. Suzhou’s lack of top-ranked universities and research institutions further encumbers its efforts to develop its own R&D capacities and improve technological levels of indigenous firms. The technological gaps between TNCs and local firms have hindered the establishment of production networks between them. This mismatch was emphasized by firms the author visited in Suzhou.

Second, the structural features of FIEs in Suzhou also affect the embeddedness. Most of the FIEs in the ICT sector in Suzhou are coming from Taiwan, whose investment is characterized by network capitalism, especially network-based cross-border production. Taiwanese firms, as subcontractors for globally leading manufacturing firms, tend to adopt the strategy of group investment and geographical clustering due to a similar cultural background, existing business relations and the common political risks they face. This clustering is also based on the production, credit and social relations that were established among these firms in Taiwan before they relocated to mainland China (YANG, 2007). There is little incentive for them to add new suppliers from local firms, given cost and technological and institutional mismatches. The concentration of the ICT industry in greenfield development zones further limits global–local networking and embeddedness.

The problem of intellectual property (IP) rights also contributes to structural mismatch. Besides cultural and credit reasons, Taiwanese firms tend to reserve key positions for Taiwanese to protect IP rights and provide job opportunities for their people. Taiwanese firms, as the second and third tiers of leading global firms, are concerned about the potential of China taking over their businesses. Efforts to promote innovation in China have challenged Taiwanese firms’ lead in innovation and technology. Taiwanese corporate leaders are concerned that internal promotion of Chinese citizens and networking with indigenous firms would leak key technologies to Chinese competitors, without the protection of IP rights. Because Taiwan and mainland China share a common language and culture, it would not be difficult for local people to exchange technological and commercial secrets.

Third, the weak embeddedness has a strong institutional dimension, leading to institutional mismatch.

The emphasis of local governments on FDI limits the resources and support for the development of local private enterprises and the service sector, a policy mismatch created by a strategic preference. National-level development zones in Suzhou are largely designed for foreign companies and investors, which denies domestic firms access to land and development resources. The weak domestic and service sectors in these development zones provide few opportunities for networking between foreign and domestic firms, contributing to the weak embeddedness of FIEs.

The Suzhou government, as influenced by Singapore through the management of CSSIP and training in Singapore, emphasizes providing professional and transparent services to foreign firms and avoids directly interfering with businesses to reduce problems of corruption and *guanxi* (relation) cost, which are often considered the major reasons for the relocation of FDI from the PRD to the YRD and the lag behind of FDI in interior China. To be fair, the Suzhou government is aware of the problems of weak embeddedness and has encouraged local and domestic firms to network with FIEs.

The last mismatch arises from FIE clustering in development zones. However, such places also have weak economic bases, which limit the potential for local companies to serve as suppliers for TNCs. While this is common for development zones in China and many other developing countries, the situation is also related to the particular geographical context of Suzhou – Suzhou’s private enterprises are largely based on TVEs located in suburban counties, while FDI concentrates in national development zones in city districts. Such a ‘spatial mismatch’ in location between TNCs in development zones and TVEs in suburban counties constrains production linkages and knowledge flows.

Based on the author’s fieldwork, a few areas where embeddedness is observed can be identified. FIEs are boosting their efforts to penetrate the growing Chinese market, and localization is one strategy for accomplishing this. Embeddedness can also be found on broader geographical scales, such as the YRD, and for more competent firms in the PRD. Moreover, firms in electronic parts and components appear likely to have more production linkages with local firms. Lastly, FIEs that are small in size and located in peripheral areas of the region also tend to more actively seek localization.

The local governments are clearly aware of the importance of FDI embeddedness and the need to develop local innovative capacities. However, they have been cautious in pushing for TNC local embeddedness and technology transfer because of their limited bargaining power. To reduce the dependence of the city on manufacturing FIEs, the government has recently launched a series of policies to promote endogenous innovation capacities and the development of business services and private enterprises. The city has

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established a number of 'creative platforms' for R&D and education. The Suzhou Industrial Park has created many incentives for R&D and high-technology industry, including funding to encourage technology development, innovation and firm start-ups.

The research also has important policy implications for China and other developing countries. The Suzhou case suggests that localizing TNCs is an important aspect of the development process to which localities must pay particular attention, especially as regards the negative consequences of promoting satellite districts. While the overall assessment here of the

Suzhou pathway to development is positive, Suzhou might be better off if it had paid more attention to business services and local domestic firms.

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