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Abstract

Over the past two decades, China has launched a nationwide endeavor to push domestic firms up the value chain. This article explores why, in some localities, Chinese firms had significant success in upgrading, while in other localities, firms were paradoxically trapped in a race-to-the-bottom competition. Drawing on national economic census data, a firm-level survey, and in-depth interviews, the article conducts a controlled comparison of China's largest electronics manufacturing bases in the Yangtze and the Pearl River Deltas. It argues that the local government's choice of global business allies shaped the upgrading behavior of domestic firms. When local governments allied with large multinational corporations (MNCs) at the top of the value chain, they reinforced the hierarchical structure of production, shrank the upgrading space for domestic firms, and squeezed them to the bottom of the value chain. In contrast, alliances with small foreign invested firms at the bottom helped break the hierarchical segregation and held more potential for local learning and innovation. The article sheds new light on the question of when industrial policies succeed or fail to facilitate domestic upgrading in a globalized era.

Keywords

China, state-business relations, industrial policies, upgrading, FDI, globalization

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Despite its ascendance as a manufacturing titan in the global economy, China is no longer content with its role as the world's "factory" based on cheap labor. Over the past two decades, the central government has launched an ambitious campaign of industrial upgrading, seeking to shift the economy's focus from pure attraction of foreign direct investment (FDI) to encouragement of indigenous innovation capacity among domestic firms.¹ The country's largest manufacturing and exporting industry, the electronics industry, is a key sector that has been undergoing such a transformation since the 1990s.² Although the national government created a spate of policy packages to motivate local initiatives, the eventual outcomes of firm upgrading—defined as activities that move from lower value-added to higher value-added activities—varied sharply among localities.

Nowhere does this divergence seem more puzzling than in the cases of Suzhou in the Yangtze River Delta and Shenzhen in the Pearl River Delta, two of the world's largest electronics manufacturing bases, with populations similar to Greece and Belgium. Together these two cities manufactured 70 million of the 140 million notebook computers and 360 million of the 1.4 billion mobile telecommunication devices produced globally in 2010.³ Despite similar conditions in economic development, employed labor, degree of exposure to FDI, and electronics output, domestic firms in Suzhou remained trapped in a race-to-the-bottom competition based on low-cost labor and thin margins of profit, whereas a significant number of Shenzhen firms demonstrated capabilities to climb to higher positions on the value chain.

Why did state upgrading initiatives generate such diverse results in localities situated within the same national context and with similar economic conditions? This article argues that the diverse upgrading outcomes stem from the state's initial choice of global business allies in the take-off stage of the electronics industry. In Suzhou, the electronics industry took off with the government's priority given to a selective group of large-scale, global leading multinational corporations (MNCs) that controlled the top position of the value chain. By contrast, in Shenzhen, bureaucrats launched the industry by attracting a broad range of small, "guerilla" foreign invested enterprises (FIEs) that occupied the bottom position of the value chain.⁴ The state's choice of global allies shaped local firms' upgrading behavior, albeit in a highly paradoxical way. The alliances with small FIEs—rather than with large, top-ranked global firms—were much more effective in cultivating domestic upgrading capabilities.

The paradox above occurred because the government-foreign firm alliances influenced the configuration of local production that the government created among domestic businesses. These elements defined the learning and upgrading space for domestic Chinese producers. When a city government allied with large global firms, the emerging supply gap between global and domestic firms encouraged both the government and MNCs to promote a group-offshoring strategy, enabling foreign firms to occupy various segments of the value chain. This strategy amplified the power disparity between global and local firms, squeezed and segregated the latter into the bottom of the value chain, and forced them to compete on cheap labor and limited production opportunities. The government's upgrading approach thus reduced learning opportunities and dampened the capacity for indigenous innovation. By contrast, a city government's alliance with small foreign electronics firms resulted in the encouragement of

subcontracting that broke the hierarchical segregation between the global and local firms and cultivated stronger incentives for domestic upgrading.

The argument advanced here addresses the inadequacies of existing works on the operation of industrial policies within a globalized context. Rather than directly associating the development outcomes with a typology of the state, the article examines closely how the state's attraction of foreign enterprises and the power disparity in the emerging production relations influence the starting point and the subsequent trajectories of upgrading. This important step also reconciles and explains the previously contrasting findings about the upgrading prospects for local producers within global production networks. The effectiveness of the state upgrading policies is highly contingent upon the relative position of global and domestic businesses and the technology gap between the two. The next section frames the contribution of the study to existing debates on upgrading among the current generation of globalized developers before delving into a controlled comparison of Suzhou and Shenzhen.

Reframing Industrial Upgrading in a Globalized Era

Industrial upgrading is one of the most daunting challenges facing developing countries. It seems all the more so in an era of globalization. Although early studies demonstrated the success of East Asian developmental states in orchestrating economic transformations through selective industrial policies, scholars have identified an array of difficulties for pursuing these policies within the current globalized context.⁵ The liberalized trade regime has made the protection of infant industries and the promotion of exports illegal, constraining the use of tools for nurturing national champions.⁶ The rapid advancement of technology has created unprecedented uncertainty for the state to judge when and how to intervene in innovation activities about which it has little knowledge.⁷ More profoundly, the rise of FDI, global value chains, and production networks has integrated firms in late developing countries into a multistate complex, and at the same time, has fragmented the production process into distinctive stages.⁸ As such, industry-targeted policies adopted by South Korea and Taiwan—where FDI was cautiously limited—are much harder to implement in the current “globalized” developers such as China, Brazil, and Southeast Asia, where inward FDI plays a significant role.⁹

When can industrial policies succeed in promoting domestic upgrading within the new context of globalization? Existing studies offer several answers. Scholars of neo-developmentalism have explicitly acknowledged the complexities of state intervention within the global economy.¹⁰ In order to design and implement informative policies that swiftly adapt to rapid industrial and technology changes, they argue, the state needs to develop dense networks with foreign and local firms as well as fostering connections between the two. Flexibility and adaptability, rather than the rigid planning valued in the conventional statist perspective, is the key. Nevertheless, the explanatory power of this literature can be strengthened by a comparative research design that goes beyond successful cases and also examines regions where such efforts failed. In particular, indigenous firms in the countries these authors studied tend to be

research-intensive, whereas those in manufacturing-based countries such as China are mostly struggling at the very bottom of the global production hierarchy, limiting the possibility of direct technology partnership with global firms.¹¹ Under such circumstances, what type of interaction between global and local firms should the state facilitate in order to help the latter to upgrade?

A growing body of recent literature directly tackles this question by examining the achievement of upgrading in developing countries through global integration. Some scholars hold an optimistic view and see upgrading as a more or less “natural” process as long as the state actively facilitates the participation of local suppliers in global production networks. They argue that producing for foreign firms can allow learning by doing, which helps local suppliers to perform to global standards and achieve incremental upgrading in their manufacturing capabilities and the organization of production.¹² Others, in contrast, warn of the possibility of a “shallow integration,” a “modularity trap” or “enclave economy,” and therefore emphasize the unequal bargaining power of the national government vs. foreign capital.¹³ These studies found that upgrading policies are most likely to succeed when governments are able to persuade MNCs to go beyond enclave economies and generate local procurement linkages that act as channels of technology transfer.¹⁴ Both strands, however, tend to focus on how global firms would “allow” spillover effects to take place. What remains understudied is whether the foreign investment that the government deems beneficial is indeed appropriate to cultivate incentives for learning and upgrading by indigenous producers.¹⁵ Examining the incentives and behaviors of domestic firms offers a clearer explanation of why the local benefits of global production were observed by some scholars but not others.¹⁶

This article aims to address these inadequacies and make two contributions. First, while agreeing with neo-developmentalism on the role of the state in brokering and mediating between the global and the local networks, I argue that this role is conditioned by the starting position of the foreign firms in relation to domestic firms on the value chain. When local governments in China attracted global firms occupying the top position, as in the case of Suzhou, the use of foreign firms as drivers for local upgrading entailed a top-down upgrading approach, which concentrated state support on large MNCs and sought to pull indigenous firms up the value chain. When local governments brought in FIEs on the lower section of the value chain, by contrast, the strategy generated a bottom-up path that aimed to push firms up the value chain. As I will show, the latter approach resulted in a configuration of production that was more suitable for upgrading than the former. Therefore, relying only on a typology of the state (e.g., developmental network state or adaptive state) is unlikely to tease out factors influencing the upgrading outcomes, unless we examine the structure of local production resulting from state policies.

Second, participation in global production networks can indeed be a viable way to upgrade, as previous works contend, but its success is shaped by the varied learning opportunities and upgrading incentives that global production provides for domestic firms. I found that when a large technology gap existed between global and domestic producers, the pressure from the government for global firms to generate local

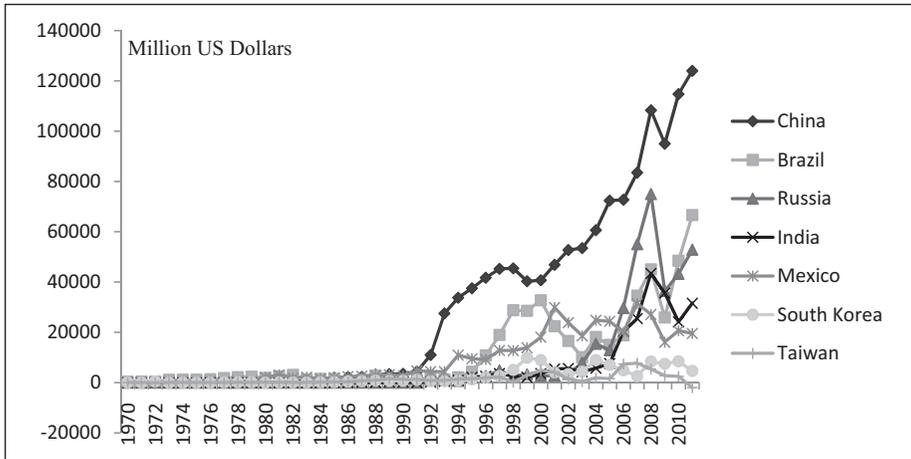


Figure 1. Inward FDI in Emerging Economies, 1970-2010.

Source: UNCTAD

linkages increased the tendency of group-offshoring. This strategy deprived domestic producers of learning opportunities, reinforced the government's support for large global firms, and dampened indigenous upgrading incentives. Only when the technology gap was manageable could the local capabilities match the subcontracting needs of small FIEs and generate the policy space for pushing domestic firms up the value chain.

Finally, the article goes below the national level through a research design of sub-national controlled comparison in the electronics industry. Methodologically, this strategy provides the advantage of controlling for national political and economic environments when explaining local variation. Substantively, the article builds on many studies of the subnational political economy of China, and it highlights the Chinese locality as an important unit of analysis by showing the persistence of local variation despite the homogenizing forces of globalization.¹⁷

Varieties of Local Upgrading Strategies: Pulling From the Top or Pushing From the Bottom?

In contrast to the ISI strategy adopted in Maoist China, industrial policies in post-Mao China have been governed in tandem by two competing policy paradigms. On the one hand, the rapid rise of the pro-FDI paradigm since the beginning of the Dengist "reform and open door" policies in 1979 made China the largest recipient of FDI in developing countries (Figure 1). On the other hand, a more recent paradigm of "indigenous innovation" placed emphasis on the importance of domestic firms building their own technology capabilities. This paradigm could be traced back to the mid- to late-1980s but did not gain national attention till the late 1990s and early 2000s. The electronics

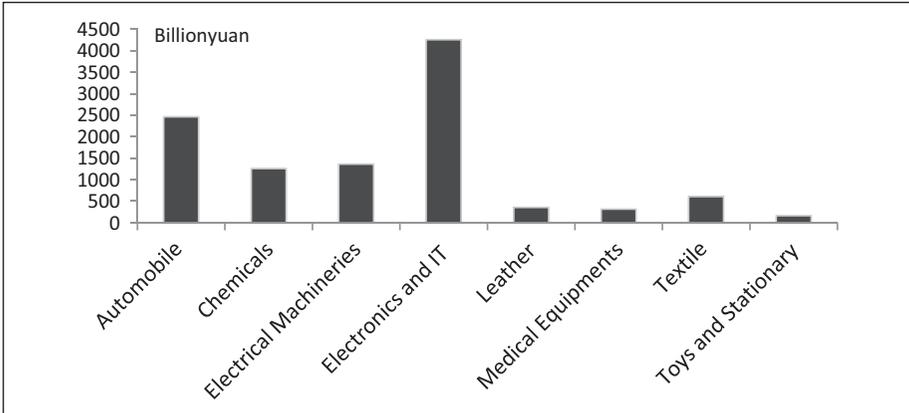


Figure 2. Output by Foreign Invested Firms in China's Major Manufacturing Industries 2010.

industry gained central attention in the paradigm-shifting process as it was a major area of FDI attraction (Figure 2) and at the same time became a new target for promoting industrial upgrading and indigenous innovation.

The implementation of policy changes at the local level was far more complicated. Instead of abandoning previous practices in the attraction of FDI, local governments built upon the basis of FDI attraction to achieve the goal of upgrading the electronics industry. Two major approaches emerged at the local level. The first started by prioritizing the attraction of large-scale, top-ranked MNCs and using these MNCs to drive up local industrial capabilities. The second began with the attraction of small-scale FIEs at the bottom of the value chain, and gradually pushed domestic firms up the ladder. Suzhou City in Jiangsu Province and Shenzhen City from Guangdong Province are the quintessential cases for the two paths of upgrading.

The paper employs a methodology of controlled comparison of these two cases, following the logics of structured, focused comparison and the most similar case selection criterion.¹⁸ The analysis draws on more than 100 in-depth interviews with local government officials, electronics firm managers, and research and development (R&D) staff in Guangdong and Jiangsu between 2008 and 2011. These interviews were supplemented by China National Economic Census in 2008 carried out by the National Bureau of Statistics at both the firm and the city level as well as factual and attitudinal data from a national survey of 200 firms administered by the author in 2011.¹⁹

Suzhou and Shenzhen were chosen for study due to their importance and their similarities, which provided for ideal control in basic economic conditions. Jiangsu and Guangdong accounted for 60 percent of total electronics output and exports among all the thirty-one mainland provinces in 2009. The cities of Suzhou and Shenzhen were respectively the manufacturing center of each province, producing 35 percent of electronics products and 40 percent of electronics exports in China among the 341

Table 1. Basic Economic and Industrial Conditions in Suzhou and Shenzhen (2008).

Cities	GDP (billion yuan)	Gross industrial output (billion yuan)	Population (thousand)	Electronics output (billion yuan)	Electronics output by FIEs (billion yuan)	Employment in the electronics industry (thousand)
Suzhou	670	1,863	9,217	645	628	1,132
Shenzhen	781	1,585	8,768	911	633	902

Source: *Jiangsu Statistical Yearbook 2010*; *Guangdong Statistical Yearbook 2010*.

Table 2. Suzhou and Shenzhen Domestic Electronics Firms Compared (2008).

Upgrading indicators	Suzhou per domestic firm	Shenzhen per domestic firm	Upgrading indicators divided by firm scale	Suzhou per domestic firm in proportion	Shenzhen per domestic firm in proportion
R&D expense (thousand yuan)	1,320	13,356	R&D expense/ industrial output (%)	1.065	2.035
New products output (thousand yuan)	12,560	125,412	New products output/ industrial output (%)	3.906	10.160
Number of new product projects	0.63	3.53	Number of new product projects per person	0.004	0.010
Number of patents applications	0.60	14.17	Number of patents per person	0.003	0.006

Source: Economic Census Center, National Bureau of Statistics in China.

prefectural-level administrative units. Furthermore, the local governments of Suzhou and Shenzhen pioneered the two typical upgrading strategies that were widely emulated by localities within and outside of their provinces. Finally, the two cities share similar national ranks in terms of gross domestic product (GDP), gross industrial output, population, and are at similar stages of development in the electronics industry (Table 1).

Despite these similarities, domestic firms in Shenzhen and Suzhou showed very different motivations for upgrading. The contrast was clear when comparing firm-level data of Suzhou with Shenzhen (Table 2). Compared to Suzhou, Shenzhen domestic firms on average had ten times the R&D expenses, ten times the new product output, six times the number of projects in new product development and twenty-four times the number of patent applications. This difference is striking even when taking into consideration the difference in the scale per firm and comparing the indicators for each firm in proportion to the industrial output and total employment.

There are several potential causes for the divergent outcomes, none of which can provide a fully satisfactory explanation. The first is that Suzhou may have had a lower starting point and a weaker industrial base than Shenzhen. However, the reverse seems to be true. Suzhou started developing its electronics industry in the 1950s, three decades earlier than Shenzhen, so that by 1979 (the beginning of the post-Mao era), Suzhou had at least twenty-five domestic electronics enterprises and Shenzhen had

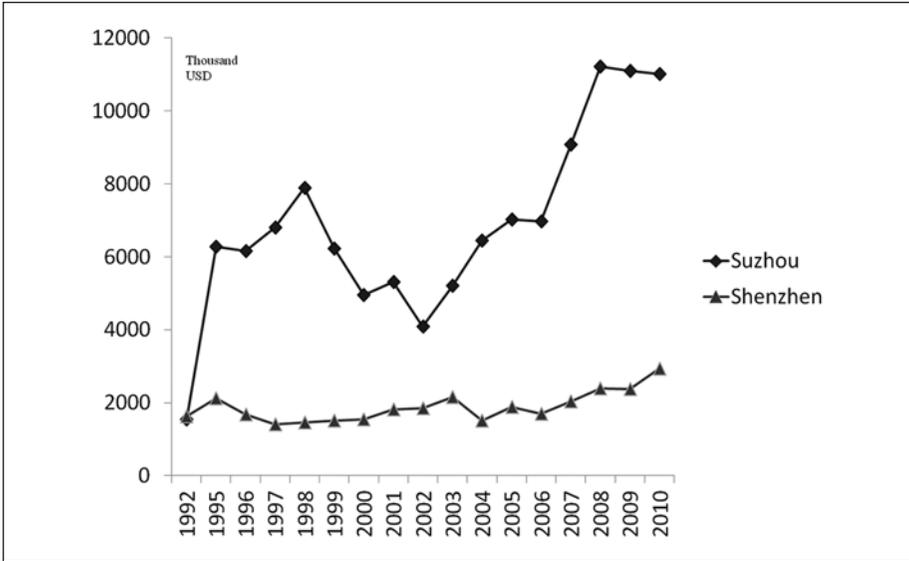


Figure 3. Average size of FDI projects in Suzhou and Shenzhen.

Sources: Suzhou Statistical Yearbook; Shenzhen Statistical Yearbook (various years).

only one. By 1991, a decade into the reform era, Suzhou achieved a total industrial output of 58.4 billion yuan, almost three times Shenzhen's 19.7 billion yuan.²⁰ Although Shenzhen did open up for foreign investment earlier, the widening gap between the two developmental approaches in Figure 3 shows that Suzhou is not simply replicating an earlier stage of Shenzhen. Second, the fact that Shenzhen is geographically close to Hong Kong and Suzhou is adjacent to Shanghai may explain their diverse paths. Ethnic Chinese firms have, however, invested in both regions. The real difference is that only large ethnic Chinese firms such as Taiwan's Compal can qualify for the Suzhou government's attention. Similarly located on the Pearl River Delta near Taiwan and Hong Kong, Xiamen City of Fujian Province only has 13 percent of its electronics produced by ethnic Chinese, whereas foreign firms from other regions (especially OECD countries) produced 81 percent of the electronics.²¹ In both Xiamen and Suzhou, it is the government's selectivity on firm size rather than geographic distance that keeps smaller FIEs from investing. Third, one may suspect that the Shenzhen government has more experience in promoting industrial upgrading than that of the Suzhou region. Quite to the contrary, Suzhou was *the* epitome of a local developmental state in the 1980s, and the entire Southern Jiangsu (*sunan*) region is associated with a strong historical record of coherent planning and implementing industrial policies.²² Finally, human resources may contribute to the difference between these two localities. Both the Yangtze and Pearl River Deltas have abundant labor, each employing about 30 percent of the 200 million migrant workers in China. In terms of the number of science and technology personnel in the electronics industry, Guangdong (where

Shenzhen is located) did exceed Jiangsu (where Suzhou is located) in the 2000s. However, Jiangsu had three times the personnel of Guangdong in the early- to mid-1990s and was only overtaken by Guangdong since 1998.²³ This fact suggests that Jiangsu did not lack human resources from the beginning of the upgrading period. The differences may result from its upgrading policies and hence each region's attractiveness to entrepreneurs and scientists.

The following sections unravel the puzzle through a two-stage analysis, which examines a) how different types of foreign capital emphasized in the local government's investment attraction strategy affected the starting point of their upgrading, and b) how the starting point shaped subsequent trajectories by generating distinct production relations between global and domestic firms, which ultimately impeded or facilitated the local upgrading behavior.

Allying with the "Dragon's Head": The Investment-Seeking State in Suzhou

Localities in Jiangsu Province in the Yangtze River Delta are exemplars of the approach of concentrating on large MNCs, which provided a shortcut for achieving political mandates at a speed incomparable with small FIEs. The region started building the electronics industry in the 1950s due to proximity to Shanghai and established a strong collective-owned sector in the post-Mao period and began to develop several well-known domestic brands in electrical machinery and electronics in the 1980s. The path of relying on collective enterprises, however, did not go very far before the global waves of outsourcing washed away the collective period and replaced it with a pro-FDI era. The region's practice of FDI-attraction originated from Kunshan, a county-level city under Suzhou Municipality, which established the earliest locally funded Economic and Technology Development Zone (ETDZ) in 1985.²⁴

Not every investment, however, was favored by local officials. In the early 1990s, ahead of other localities in coastal China, the governments of Suzhou and Kunshan boldly proposed the slogan of building an electronics industry that would become "larger and stronger" (*zuo da zuo qiang*), focusing on attracting investment projects that were "higher, larger and newer" (*gao, da, xin*), setting the major goal of expanding the size and investment scale of electronics and IT FIEs.²⁵ In a highly selective manner, local bureaucrats targeted their support to the most prominent global lead firms in electronics, such as Samsung, Nokia, Foxconn, Intel, LG, Simons, Sharp, Phillips, and Panasonic. These MNCs were, simultaneously, the main source of local FDI, GDP, government revenue, exports, and high-tech goods production. In addition, the number of Fortune Global 500 firms a locality had was also a factor that bolstered political achievement in Jiangsu's cadre promotion process, and it helped strengthen the annual reports submitted to the provincial and central government.

Although the political mandate from the central government during the late 1980s and early 1990s was to attract FDI through joint ventures, officials in Suzhou and Kunshan were limited in the matching funds that they could provide from their own

revenue. Therefore, most FIEs were registered as joint ventures but in effect disguised wholly foreign owned enterprises (WFOEs), with production completely controlled and managed by the foreign side.²⁶ Using beneficial policies to attract WFOEs allowed Kunshan ETDZ to expand the volume of FDI rapidly from \$1.5 million in 1984 to \$612 million in 1995.²⁷ Kunshan/Suzhou soon became the endorsed role model under the pro-FDI paradigm and in 1987 won the praise from Zhao Ziyang, the General Secretary of the CCP. The model was widely copied by other cities in the province, such as Wujiang, Zhangjiagang, Taicang, Wuxi, Najing, and Nantong.²⁸ With electronics and IT identified as one of the major high-tech industries, the region rose to become one of the biggest magnets for electronics FDI in coastal China.

Local government officials not only tilted the major favorable tax, funding, and tariff policies toward large MNCS, but they also provided them with unprecedented levels of friendly and efficient service. For example, in order to compete with Shanghai to attract Compal—the second largest global manufacturer of notebook computers—to Kunshan ETDZ, local bureaucrats relocated eighty households of peasants within thirty days to vacate the land for building the forty-eight-acre Compal factory. Panasonic similarly marveled at the speed of the government when it merely took Suzhou officials a year to get the entire factory and the thirty miles of industrial pipes constructed and hand over the key. In fact, building an environment that “befriends the business, ensures the business, and enriches the business” was published as the formal policy for local governments to serve foreign business, and localities like Kunshan also created rules entitled “The 28 codes for serving foreign business” in order to channel the behavior of bureaucrats.²⁹ While holding large foreign capital in a high position, officials honestly admitted that they “would not even bother” with any projects that were less than \$30 million.³⁰ The alliance with large electronics MNCs seemed to have created a shortcut for industrial success: Kunshan ETDZ, for instance, leaped forward from a small industrial park for a Japanese glove maker in 1985 to the world’s largest manufacturing location for notebook computers in the 1990s.

In the 1990s, when the national policy concern shifted to indigenous innovation, local officials were confronted with the challenge of enhancing the competitiveness of local electronics producers. Rather than abandoning the previous alliance with MNCs and thus losing the largest contributors to local revenue and GDP, local governments chose to achieve upgrading by establishing local linkages from the MNCs. The logic behind this strategy was that large electronics MNCs would play the role of the “dragon’s head enterprises” (*longtou qiye*) that were expected to drive (*daidong*) the development of local firms in the midstream and downstream on the entire production chain. “Once these dragon’s head enterprises were set up and linked to the local industry,” reasoned local officials, “smaller enterprises on the dragon’s tail would automatically follow up.”³¹ Thus in addition to being the main boosters for local economic indicators, MNCs as dragon’s head enterprises also became the hope for dragging local producers up the value chain.

Allying with “Guerilla Investors”: The Investment-Seeking State in Shenzhen

Localities in the Pearl River Delta represented by Shenzhen—a region historically known for its *petit bourgeois*—stepped on a very different trajectory on the eve of the post-Mao reform, although the difference was minor at the beginning.³² The electronics industry started with local bureaucrats’ enthusiasm for attracting numerous small investment projects drawing on networks from the “China Circle” area, notably Hong Kong and Taiwan.³³ This distinctive pattern of investment—referred to as “guerrilla” style investment—penetrated cities, counties, townships, and villages. The notion of guerrilla investors is borrowed from You-tien Hsing and refers to small-scale investments negotiated with individual officials at the grassroots level, which are highly flexible in terms of property rights arrangements and investment conditions.³⁴ Figure 3 compares the size of FDI projects in Suzhou with that of Shenzhen, suggesting two persistent patterns of FDI attraction in the two cities. Most of the firms initially invested in Shenzhen engaged in *san lai yi bu* production, which means that foreign investors provided materials, sample designs, components, and imported machineries for conducting processing and assembly, while the Chinese side provided land, factory, and labor. Most of these guerilla investors, despite the fact that they produced components of computers or mobile phones, were located at the lower end of the global value chain.

Local bureaucrats played a crucial role in creating, supporting, and legitimizing the flexible practice of informal contracting that brought together locally owned land and labor resources with foreign capital and technology.³⁵ On paper, a contract for setting up *san lai yi bu* firms was signed between a foreign investor and a local Chinese firm. In reality, however, due to scarcity of domestic electronics firms in the takeoff period, the latter often existed in name only and the local government was the *de facto* representative from the Chinese side. The new firm created out of the contract would then register under a collective enterprise owned by the local government, usually under the name “Economic Development Company of X Township/County.” In exchange, the firm would submit an annual processing fee (*gong jiao fei*) to the local government.³⁶ For example, the first such informal contract in Shenzhen was signed in the late 1970s between Hong Kong Electrical and Electronics and Shangwu Brigade Processing Factory in Bao’an County Shiyuan Commune. The Shangwu village CCP party branch was the actual representative of the Chinese side. The firm created by the contract, the Yigao Electrical Loop Firm, was set up on the second floor of the Shangwu village party branch office building as a disguised FIE wearing a collective hat. Firms as such neither have an independent corporate status nor hold an official business license, but were created under informal contracts brokered by local bureaucrats.³⁷

The informal contracts prevailed due to the benefits for both governments and foreign investors. For local officials, government-business informal contracting provided them quick access to the benefits of foreign investment and helped them overcome the initial lack of indigenous enterprises while circumventing the cautious eye of the central state. Moreover, local governments were entitled to the processing fees submitted

by the informally contracted enterprise, with the largest share of the processing fee going to the level of the government (city/county/township) that actually signed the contract. As such, bureaucrats at each level went out of their way to broker investment deals.³⁸ Foreign investors, too, often avoided paying taxes due to the lack of legal status and found the procedure of signing informal contracts with local bureaucrats in a week much more appealing than taking two months to formally register a foreign enterprise. When Hong Kong and Taiwanese guerrilla investors poured investment into the Pearl River Delta, tens of thousands of *san lai yi bu* enterprises were created in this way between 1980 to 2000, among which an estimated of 980 were electronics firms.³⁹

As such, the major business players that local bureaucrats allied with in the pro-FDI period of Shenzhen's electronics industry were a large number of SMEs, especially FIEs invested by ethnic Chinese. In fact, the electronics industry won the support of the government precisely due to its characteristics of being "light, small, precise, and new," which were very appealing to a young city like Shenzhen, which did not have a basis for heavy industry.⁴⁰ Unlike the large, integrated electronics MNCs in Suzhou that were typically the lead firms occupying the top of the production hierarchy, these small-scale FIEs engaging in processing trade were mostly situated at the bottom. The takeoff stage of the electronics industry in Shenzhen and in the broader Pearl River Delta thus helped cultivate flexible policy connections between local bureaucrats and a broad range of firms without showing prior discrimination against their size. Although the practice of setting up these firms invariably involved petty corruption, it had the de facto effect of expanding the number of firms at the bottom of the value chain.

The connections with small FIEs became crucial when Shenzhen came to the cross-road of choosing the path for industrial upgrading and indigenous innovation in the 1990s. Shenzhen could have certainly converged on the top-down model tried in Suzhou, and there was indeed an attempt in this direction in the mid-1990s. But precisely due to the dense policy connections between bureaucrats and SMEs, the initiative met with staunch resistance from the officials of manufacturing districts.⁴¹ The city government eventually abandoned the top-down alternative that would abruptly disrupt the initial developmental path. While certainly acknowledging the importance of industrial upgrading, officials stayed with the bottom-up approach chosen at the outset of the post-Mao reform that would allow continuous and incremental progress.

Reversing the Fortune: How the State and Global Capital Shaped Domestic Firm Behavior

The most counterintuitive and interesting finding about the local upgrading initiatives was how state policies shaped local firm behavior. Where the local state allied with highly reputable MNCs and started by pulling local firms from the top of the value chain, domestic electronics producers showed little interest in upgrading and became trapped at the bottom. In contrast, where the local state began with attracting

small-scale guerrilla investors at the bottom of the value chain, local producers responded more positively to upgrading initiatives and demonstrated much stronger motivation to climb up the value chain. Although Shenzhen is often denounced as the sweatshop for small-scale, low-end manufacturing investors compared to higher-end firms in Suzhou, a “reversal of fortune” seemed to have occurred since the mid- to late-1990s.⁴² This section unraveled the mechanisms through which the local state shaped firm behavior.

Starting from the Top, Trapped at the Bottom

As Suzhou settled on the strategy of using MNCs as the dragon’s head to drive local industrial upgrading, it attracted a high volume of FDI and large number of leading high-tech enterprises. The Achilles’ heel for this model, however, lies in creating local linkages. The MNCs initially made their investment decisions largely based on the attractiveness of government policies and the low cost of the locality. The main role of Suzhou was to provide them with industrial land, factories, and low-cost labor. How to prevent these “footloose” firms from leaving for other locations that could provide similar conditions became the major challenge. After all, these large global firms were supposed to play a central role not only in the investment attraction stage, but also in the stage of local upgrading.

Pressing for local linkages and the emergence of a supply gap. In the late 1990s, local government started to press for the localization of global production and exports. In the early 2000s, the director of Kunshan ETDZ urged in a proposal the implementation of systematic measures to make these MNCs not only “locate” in but also “take root” (*sheng gen*) in these localities.⁴³ Like many other developing countries, the main measures were that government officials proposed “local content” requirements to global firms through bargaining meetings in order to make the latter offshore a larger segment of production networks and adopt more electronics components manufactured by local electronics suppliers.⁴⁴ Local firms were supposed to benefit from the driving force of the MNCs and learn from their “foreign teachers” by producing for these technologically advanced firms.

The problem of the initiative, to use a metaphor from a MNC manager, was that those electronics MNCs playing the role of dragon’s head often had a hard time directly finding a dragon’s body and tail among domestic firms.⁴⁵ Most electronics MNCs had hardly any previous relations established with domestic firms. Although new relations could be established, there was often a considerable gap between the types of products that MNCs demanded and those that local technological capabilities were able to supply. Several MNCs—including Compal—reported that they did initially try to use locally manufactured components, such as the glass substrates for LCD screens from Kunshan IRICO, but found the quality of the components extremely lacking and thus switched back to their foreign suppliers.⁴⁶

The rise of group-offshoring as an industrial policy. How should the local government and MNCs settle the dilemma that on the one hand, the main suppliers of MNCs were

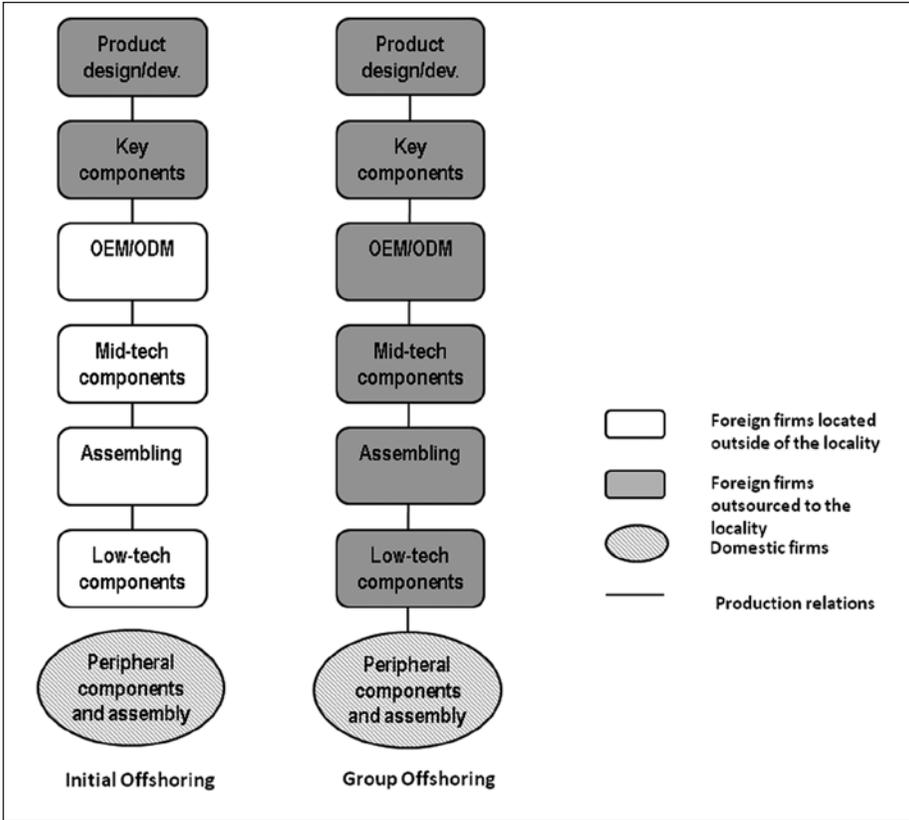


Figure 4. The Structure of Electronics Production in Suzhou.

located abroad and on the other hand, local bureaucrats pressed for the localization of production? The dominant strategy that emerged in the late 1990s and early 2000s out of the bargaining process between local bureaucrats and global capital was “group offshoring.” Instead of relocating single firms to China, entire production chains were brought to the same locality, often with brand-name firms leading a group of suppliers that had already established long-term, preexisting production networks. As such, a distinct configuration of local electronics production was established with the top, middle, and downstream of the production chains populated by WFOEs, from product design and development (United States, Japan, Europe, South Korea), key component production (United States, Japan), to original equipment manufacturer (OEM) and original design manufacturer (ODM) production and mid-tech components (Taiwan and Singapore), and even peripheral components and subcomponents. Local producers that entered the electronics industry often could only find space at the bottom of the value chain for the production of peripheral components or the peripheral phases of the assembly (Figure 4). The group-offshoring strategy helped MNCs maintain

product quality and saved them the cost in finding new domestic suppliers. It also reduced the relocating risk for FIEs on the other nodes of production chain.

Increasingly, as the local government realized the advantages of the group-offshoring, they spearheaded, coordinated, and fully embraced the strategy as an industrial policy. Instead of bringing in a single foreign invested firm, officials preferred to bring in an entire value chain, proudly naming this pattern “when one flies in, the entire flock flies in.”⁴⁷ As an official of science and technology bureau retold a locally popular story in the 2000s,

There is a well-known story that our vice mayor joined officials from the investment promotion bureau in disaggregating a notebook computer into 1,000 components. We did so not to reverse-engineer the technology, but to identify the composition of the production chain as a basis to attract the best foreign investment.⁴⁸

The strategy was highly appealing to the interests of local bureaucrats who were seeking to build their political achievements within the cadre appointment system. First, it raised the efficiency for attracting high-tech FDI, allowing Suzhou ETDZ to attract an average of \$6 million of FDI *each single day*, more than the amount that Cambodia attracted in the entire year of 2011.⁴⁹ Second, it fulfilled the local purchasing requirement and provided government the hard indicators and statistical evidence that the dragon’s head enterprises were indeed driving the industrial upgrading of the entire “local” electronics industry.⁵⁰ Studies conducted by Kunshan government on the city’s indigenous innovation capacity highlighted that while a leading computer FIE only purchased up to 5 percent from Chinese electronics suppliers during the 1990s, the domestic procurement ratio increased to 85 percent in 2006, providing a “door-to-door” direct purchasing system. In reality, however, interviews suggest that these “local” suppliers were WFOEs, which were as foreign to the local context as the lead firms.⁵¹

The recent much-boasted effort of Kunshan to build the world’s first class “Optoelectronics Valley” in Kunshan ETDZ, with the worldwide rise of the thin-film-transistor liquid-crystal display (TFT-LCD) outsourcing, was a good example. Drawing on the impact of Compal, the valley was able to attract MNCs to outsource from various segments of the value chain between 1992 and 2010 so that by the beginning of 2011, it had one of the most complete global production networks in TFT-LCD in China (Figure 5).⁵²

Therefore, by starting from the top of the global value chain, the local state helped create and further reinforce a hierarchical order of global production among top, middle, and bottom producers, which was often seen across national borders and was now reestablished in the same locality. Due to the local government’s preoccupation with large MNCs and the utilization of group offshoring strategy, it hardly devoted any time and resources to effectively evaluating and implementing the indigenous innovation policies. To be sure, officials could easily point out an array of startup funds, innovation funds, and subsidies or tax exemptions for encouraging enterprises to engage in R&D and patent applications. Entrepreneurs soon found, however, that the rules of the

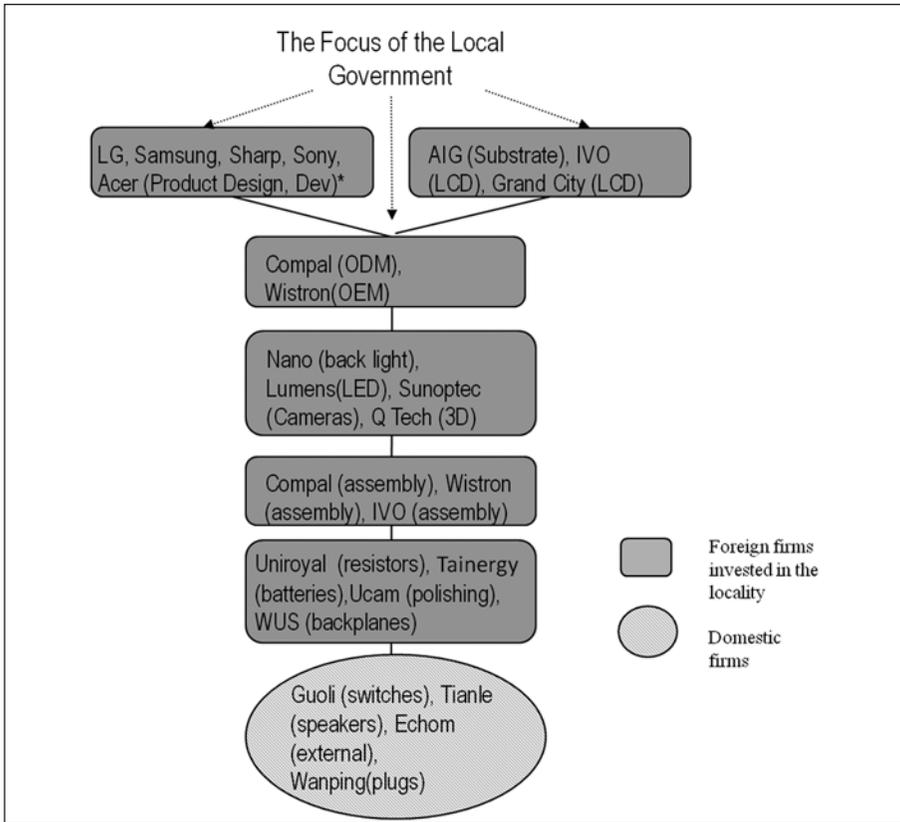


Figure 5. The Government’s Upgrading Initiative in Kunshan Optoelectronics Valley.

game in reality were quite different from the ones that were written on paper. Among other challenges, domestic enterprise managers most frequently mentioned finding industrial land (the allocation of which was controlled by government), applying for funding for conducting R&D and new product development, and gaining support for patent applications. The initial incubator for indigenous electronics and IT enterprises, for instance, was forced to move out of ETDZ in the 2000s in order to expand the export processing zone for enterprises like Compal, Wistron, and Samsung, each of which already occupied more than thirty acres of land, larger than the area occupied by all domestic private firms.⁵³ What emerged was a consolidated local production hierarchy that further strengthened the bargaining power of foreign firms and marginalized the role of indigenous enterprises.

The developmental consequences for domestic firms. Such configuration of electronics production left little space for domestic producers—the real “local” electronics firms—to upgrade to the higher stage of production. The constraint first of all stemmed

from the supply side, especially from scarce learning opportunities that domestic producers had in peripheral components production and peripheral stages of assembly. Due to the standardized production process in the peripheral components that the majority of domestic firms focused on—including resistors, diodes, light-emitting diodes, and capacitors—firms only needed to come up with standard products while keeping their costs at the lowest. According to a firm-level survey that I conducted in 2011, 77 percent of the surveyed domestic electronics firms in Jiangsu did not receive technological guidance from FIEs, and 75 percent of them based their production on the already existing blueprints or imported machinery. Due to the similarity in the nature and quality of products, price rather than quality became a crucial determinant for getting orders. Interviews suggest that even in the rare case when learning by doing occurred, the type of knowledge accumulated at the peripheral component level seemed to have little use in developing knowledge about the product at the higher level of the value chain.⁵⁴

Furthermore, and on the demand side, the hierarchical production order with each node populated by FIEs imposed high barriers of competition and quashed the aspiration of local entrepreneurs, leading them to hold a pessimistic view. The geographical closeness of the lead firms and their suppliers produced by group offshoring not only further consolidated the top positions of lead MNCs, but also strengthened the position of midstream and downstream MNCs, both in terms of their cooperative relations and in terms of their bargaining power over local government. This was in stark contrast with domestic entrepreneurs that had to engage in cutthroat competition for survival. Although most domestic electronics producers complained about the bitter experience of competing with low prices, cheap labor, and razor-thin margins of profits, they viewed upgrading to the higher segment of the production chain as impractical and infeasible.⁵⁵ Investing in upgrading meant directly competing with FIEs at the higher level of the chain, which not only had advantages in capital and technology, but above all, established support from local officials and long-term connections with upstream customers. In evaluating the high risks involved in upgrading, private firm owners and shareholders were far more likely to expand existing market shares and production lines rather than investing in new product development, R&D, or product engineering.⁵⁶

The provincial level survey data also indicates similar trends (Figure 6). Only 30 percent of the surveyed firms in Jiangsu as opposed to 63 percent in Guangdong view investing in upgrading and innovation as an attractive option. Likewise, Jiangsu firms are less likely to consider the allocation of government support for upgrading as fair. As a result, a lower proportion of domestic firms in Jiangsu choose to engage in higher-value added activities.

The fact that rules governing indigenous innovation were trumped by the attention to MNCs and the concern for enterprise size ended up raising the costs for—and often discriminating against—firms that intended to innovate. Such an environment gave rise to a popular saying: “in China, if a firm does not innovate, it is waiting to perish; but if it does innovate, it is seeking to perish.”⁵⁷ Despite its sarcastic tone, this observation was not uncommon among electronics entrepreneurs in the Yangtze River Delta.

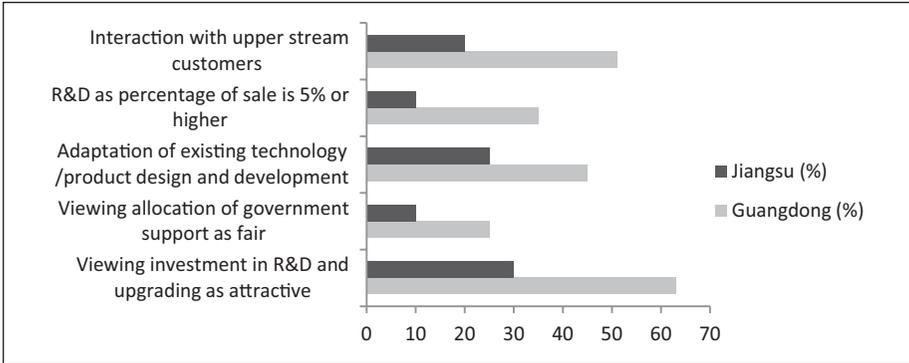


Figure 6. The Upgrading Incentives and Behavior of Domestic Firms.

Source: 2011 firm survey.

As encounters with state policies persisted and penetrated into various aspects of business operation, they generated long-term views that ossified into rules, which tilted firm behavior away from moving up the value chain. These rules and norms, such as “the innovation funds are of course not based on actual R&D activities,” or “there is no use trying to develop a new product” became tacit knowledge upon which managers of the local electronics firms based their routine decisions. As such, the options for exploring new product and design concepts and exploring new technology through R&D hardly entered the calculus of the firm decision makers. They were, willingly or unwillingly, trapped at the bottom.

Growing from the Bottom, Racing to the Top

As the electronics industry in Shenzhen in the Pearl River Delta took off with *san lai yi bu* firms set up by guerilla investors, the number of firms at the bottom of the value chain began to expand and in 1990 it reached a total number of 620, among which 438 were FIEs and 182 were domestic enterprises. Most of these producers lacked core technology and entered business through conducting processing, assembling, or selling of electronics components or end products. Throughout the 1990s, Shenzhen and Guangdong were often denounced as the sweatshops for lower-end (*di duan*) production, especially compared with Jiangsu localities, which had a much higher starting point by only attracting higher-end (*gao duan*) MNCs. It is thus ironic that Shenzhen domestic firms were eventually able to gradually climb up to the higher segment of the production chain. How did this process take place?

Facilitating local linkages of global production. As more FIEs started to produce in China, Shenzhen government facilitated and bridged the foreign-local linkages. The process can be traced to the establishment of Shenzhen Electronics Industry Development and Coordination Committee (DCC) within Shenzhen government in the 1980s.⁵⁸ The committee focused on the localization of electronic components by

encouraging investors to go beyond assembly and outsource complete components and by subsidizing local firms with initial start-up funds to engage in the manufacturing of knock-down or semi-knock-down components for FIEs, which typically include circuits, transistors, and transformers.⁵⁹

Since most FIEs initially invested in Shenzhen were located at the bottom of the value chain, the technology gap between foreign and domestic firms was manageable. After Chinese entrepreneurs and managers gained initial hands-on manufacturing experience and knowledge and learned to meet production standards, an increasing number of overseas investors began to feel confident in subcontracting complete orders to domestic producers without intervening in daily management of production. This change has provided Chinese entrepreneurs—coming from both within and outside of the region—the opportunities to develop the capabilities of managing orders independently and adapting for multiple customers. They became the first group of entrepreneurs that establish indigenous electronics firms.⁶⁰ Over time, an increasing proportion of FIEs in Shenzhen and the Pearl River Delta also began to purchase electronics components locally. The small sizes and limited organization resources of these FIEs prevented them from group outsourcing.

The emergence of these domestic firms that subcontracted production from FIEs was a crucial step in the upgrading process.⁶¹ Although some of these domestic enterprises initially registered as fake FIEs to take advantage of the lower tax rate implemented by the central government, these firms were de facto Chinese producers. They acquired orders from FIEs and engaged in *san lai yi bu* production, but the relationship between the two parties was often compensation trade or processing trade instead of joint ventures or mainland branches of FIEs. Thus, rather than disrupting the development process of domestic firms, as MNCs did when they offshored to Suzhou, the guerrilla investors contributed to the expansion of the number of domestic producers in Shenzhen at the end of the value chain through the subcontracting system.

Encouraging product learning and broadening of the domestic coalition. After domestic firms started to engage in electronics production, the Shenzhen Government, especially the DCC, encouraged domestic producers to experiment with developing their own product platforms at the same time that they were manufacturing components and processing for FIEs. During this period, the DCC helped introducing the production method of *ji mao jie he* (combining technology acquisition with trade) to a wide range of domestic firms. This means that firms earned foreign reserves through compensation or processing trade, and then used the reserves to import sample electronics from abroad that served as the basis of manufacturing their own products. For example, Kangle Electronics imported sample cassette players from Hong Kong, and then modified the players by using their own adapters, speakers, capacitors, and antennae, and adapted the cassette door and external shells for domestic markets. The initial process of *ji mao jie he* was always tough. Employees recalled that when making quad-band tape recorders with limited initial capital and backward technology, they worked in shabby factory buildings and lived in thatch huts that were vulnerable to wind and rain.⁶² By the end of 1980s, a number of domestic producers such as Huaqiang,

Table 3. Major Shenzhen Government Measures for Promoting Indigenous High-Tech Firms.

Year	Government Measures
1987	Creation of Science and Technology Industrial Park; "The Temporary Decision to Encourage the Establishment of Non-governmental Science and Technology Enterprises"
1993	"The Guidelines for Shenzhen Enterprises to Reward Technological Development Personnel" and "The Guidelines for the Acquisition and Use of Technology Development Funds by Enterprises in Shenzhen"
1996	Creation of High Tech Development Zone
1998	"The Stipulation of the Shenzhen Government to Further Support the Development of High and New Technology Industries" (widely known as "22 rules" among other cities)
2008	Shenzhen Science and Technology Innovation Ordinance
2009	Adjustment and Revitalization Plan for the Electronics and IT Industry

Source: Shenzhen Bureau of Science and Technology.

Jinghua, Baohua, and Lanhai, began to produce their own calculators, tape recorders, radios, telephones, and televisions.

In addition to *ji mao jie he*, the government also tacitly allowed the license leasing among enterprises. In the 1990s, the Chinese central state imposed regulation on the entrance to electronics products such as televisions and mobile phones through production license, and only granted them to a handful of SOEs and MNCs. Chinese firms in the Pearl River Delta invented the informal arrangement of license leasing between holders of licenses and nonholders.⁶³ The lessee became the OEM producer for the lessors, which further spread subcontracting as a form of production. Again, the local bureaucrats who were in charge of regulating the "illegal" phenomenon often preferred to "open one eye with the other closed," sometimes even actively collaborating with enterprise in the practice.⁶⁴ The license leasing strategy helped overcome the barriers of entrance in the electronics industry and broadened the developmental coalition among domestic enterprises.

Promoting indigenous high-tech firms and innovation. To further push firms up the value chain and conduct more technologically sophisticated research, the government of Shenzhen started to promote indigenous high-tech firms in the late 1980s and 1990s. While both Suzhou and Shenzhen's government had established HTDZ to support high-tech domestic firms, Shenzhen's government did not predesignate the winners or dragon's-head MNCs at the beginning, but instead encouraged and mobilized investment in the electronics and information industry from various types of enterprises, especially private enterprises. The series of government measures taken during this period, beginning with "The Temporary Decision to Encourage the Establishment of Non-governmental Science and Technology Enterprises" in 1987, provided indigenous high-tech firms with startup funds, channels of finance, continued tax breaks, and personnel benefits (Table 3). These measures aroused much passion among

entrepreneurs coming from various backgrounds to invest in electronics enterprises. The initiative incubated a number of electronics enterprises, such as Huawei, ZTE, Legend (Lenovo), Great Wall, Shenghai, Shida, and Huihuang, which were then hardly known, startup firms and later became the leaders in the electronics industry.⁶⁵ In addition, a torrent of less technology-intensive private electronics SMEs focusing on various stages of electronics components also started to flourish in the Huaqiangbei area of Futian district.

The Shenzhen government's measures to facilitate global-local linkages at the bottom of the global value chain, its encouragement of self-experimentation with domestic products, and the promotion of indigenous high-tech firms all contributed to a distinctive path of the city's industrial upgrading. The facilitation of local linkages at the bottom of the value chain made it feasible for FIEs to subcontract their orders to domestic producers instead of resorting to the group offshoring strategy. The encouragement of self-experimenting through *ji mao jie he* and license leasing broadened the range of domestic firms that could gain direct manufacturing experience. After the domestic business basis of the government industrial policies was broadened, the promotion of indigenous high-tech firms further pushed domestic entrepreneurs to invest in higher value-added activities.

Thus in contrast to the formation of a top-heavy production structure in Suzhou, what emerged in Shenzhen was a set of broadly based production networks with the majority of the FIEs and domestic enterprises starting at the bottom of the value chain. Electronics MNCs such as Sony, IBM, Samsung, Philips, Toshiba, and Thomson did not begin systematic outsourcing until the late 1990s and early 2000s, when domestic firms were already developing their own product platforms and core technological capabilities. Therefore, more opportunities for upgrading were reserved during the two decades the government was actively encouraging private firms to invest in electronics and IT.

The development consequences for domestic firms. Although they started from the lower section of the value chain, domestic enterprises gained more learning opportunities in their production process. It was not the case, however, that the FIEs willingly handed over technology to domestic businesses. Rather, it was the configuration of production that enabled domestic businesses to achieve gradual upgrading. They gained initial knowledge in manufacturing and management of orders through subcontracting of peripheral components and started developing gradual understanding of product concept and product platforms through self-experiment before moving to more research-intensive activities. To be sure, FIEs from Hong Kong and Taiwan possessed more advanced technologies and management experience, yet the gaps between overseas and mainland enterprises were manageable and they were not segregated hierarchically. Field interviews suggest that foreign and domestic enterprises were constantly interacting with each other through production, cooperation, and competition. As Figure 6 indicated, 51 percent of enterprises in Guangdong (as opposed to 20 percent in Jiangsu) had interaction with upper-stream customers, among which 70 percent had constant interaction. In other words, local governments' earlier alliances with small FIEs enabled FIEs and local producers to be linked through a set of

production networks that were far more dynamic than those in Suzhou, in addition to the Shenzhen government's deliberate measures to push domestic producers up the value chain.

The dynamics on the demand side for upgrading were also significantly different from those in Suzhou. Although some still competed at the lower segment of the value chain, Shenzhen's domestic managers saw long-term commitment to innovation in product and production process as the key to exiting the cutthroat competition and expressed much stronger motivation for climbing up the value chain.⁶⁶ This finding corresponds with the survey finding that 63 percent of Guangdong's firms (more than twice the percentage of Jiangsu's 30 percent) viewed investment in upgrading as an attractive option. Furthermore, a larger proportion of firms invested 5 percent or higher percentage of sales in R&D and engaged in adapting and improving existing products.

A key reason that competition at the bottom provided incentives for firms in Shenzhen rather than in Suzhou to invest in upgrading was that in the Suzhou case, the government's support for the MNCs and their supplier groups erected a hierarchical barrier so strong that it trumped the recognition of the possibility of upgrading in firm managers' belief systems. In assessing the overall situation, a firm's management level would vote against the idea of taking the big risk of product and process upgrading. By contrast, the opportunities of upgrading were viewed as inviting, despite being challenging, in Shenzhen.

Local entrepreneurs were typically noticed for their boldness and their aspirations to challenge upper-stream firms and even the global lead firms. Competition was inevitably intense, yet the availability of higher value-added opportunities facilitated the aspiration for upgrading. Huawei and TCL, for instance, both made initial profits by importing HAX telecommunication switches from Hong Kong and selling them in the domestic market. As numerous firms entered, profits plummeted within half a year, causing 95 percent of firms to go out of business. This propelled Huawei to use 60 percent of its initial annual sales to conduct R&D (later kept at a 10 percent level) in its own switches and TCL to develop its own platforms for telephones and televisions. Skyworth started its business in 1990 by making remote controls for televisions, whose profit shrank from 50 percent to 10 percent within a year. It was then that Huang Hongsheng made the determination to invite a group of scientists and technicians from Hong Kong and produced their first large scale IC television.⁶⁷

Under such circumstances, the Shenzhen government's supportive policies in domestic upgrading came in time and further provided impetus for a wider range of firms to take the high road of learning and innovation. There was no doubt that bureaucrats often lowered the standard of R&D set by the central government in evaluating enterprise performance.⁶⁸ These rule-bending activities, in retrospect, helped revise and adapt national policies more closely to the situation of locality, and thus cultivated the motivations for upgrading from enterprises that would otherwise be kept out of the rule-benefiting zone. Mr. Zhuo, a manager from the P Group, shared a story from his own company,

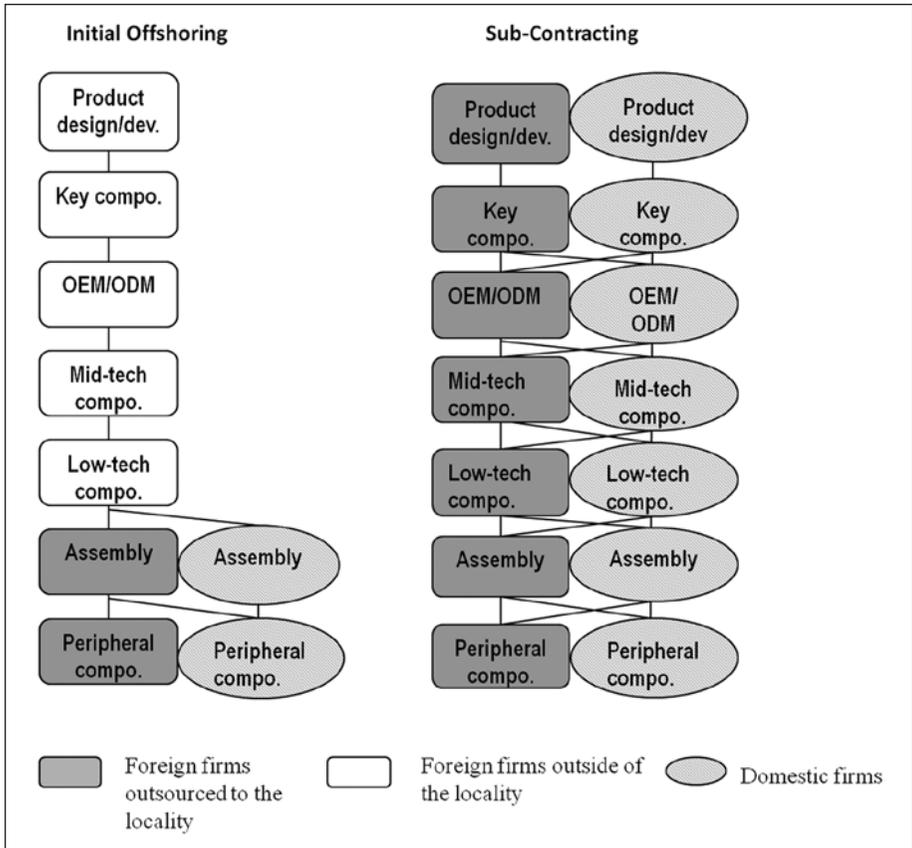


Figure 7. The Path of Industrial Upgrading for Shenzhen's Domestic Electronics Producers.

We used to be an assembler of mobile phones for a leading Multinational, L, during the late 1990s and early 2000s, which brought us huge annual sales, the highest reaching 3.78 billion yuan. But our highest profits were only 30 million. This low profit-margin pattern showed signs of running out of steam in 2004. The city government encouraged us to conduct research on our own products and introduced to the president of our group the opportunities of various innovation funds and tax policies. The company decided to give it a try and we began to produce brand products in LCD screens and mobile phones. Despite that our current annual profit is still around 30 million yuan, not huge. It is made out of an annual sale of 600 million yuan, in which case the profit rate is raised more than sixfold compared to before. In retrospect, the year of 2004 was a critical juncture for us to start on a new direction.⁶⁹

Within such a structure of production, domestic firms usually enter the industry from the bottom of the global production chain through processing trade for FIEs, learning to upgrade their own products by selling them in China's huge domestic markets and eventually competing on the international market (Figure 7).⁷⁰ The specific

upgrading approaches were dependent on firm situations. Some met the challenge head on by conducting R&D in core technology. Examples include the ZX500 and ZXJ2000 switches from ZTE and the first 10,000-line switch, the C&C08 2000 switch from Huawei in the early 1990s.⁷¹ Other enterprises, such as Xianke, engaged in flexible learning by importing the core technology and adapting it to the domestic market. Finally, an increasing number of small-scale component producers began to cluster in Huaqiangbei and produce telecommunication computer components through imitation and adaptation of existing technology and designs. By the end of 1996, the estimated number of electronics enterprises in Shenzhen increased to 2,300, employing a total of 144,000 people. Shenzhen became the largest global manufacturing location for computer boards and displays.⁷² Not surprisingly, FIEs in Shenzhen also constantly felt competitive pressure from local electronics enterprises, instead of resting very comfortably at the top of the production hierarchy as MNCs did in Suzhou.⁷³ The upgrading path thus effectively countered the reinforcement of hierarchical order often embedded in the globalized production system.

Conclusion: Playing the Upgrading Game in a Globalized Context

The comparison in this study does not imply a wholesale discrediting of Suzhou's economic achievement or an overidealization of Shenzhen, as the latter is faced with a number of social and environmental challenges as well. However, as far as the mobilization of domestic upgrading is concerned, the comparison suggests that what was a boon for global leading companies may in the long run be a bane for local producers. This finding resonates with the evidence found by Huchet in Dalian city and Yeung et al. in Beijing, where the top-down developmental approach based on group offshoring of MNCs was not favorable for domestic producers in these localities.⁷⁴

Studying these two cities representing the largest global manufacturing bases sheds new light on the perpetual question of when the state is likely to succeed or fail in promoting industrial transformation. It examines this puzzle against the background of globalized production. Just as in the classical developmental state, the state remained important in orchestrating and shaping the paths of development through industrial policies. Unlike East Asian economies, however, the penetration of global capital into the local production process has altered the microfoundation of state-led developmental initiatives at the city level. Local industrial policies that focus on leading businesses at the top as their driving force (as Japan, South Korea, and Taiwan did in their strategy of "selecting the winners") may give rise to institutions that reinforce the modularity trap at the bottom, whereas the creation of broad government-business interactions from the bottom up can have more potential to counter the hierarchical order.

The findings of the study resonate with the core argument of the neo-developmental state regarding the importance of using flexible state policies to build networks with and between global and local firms. In contrast to most of the literature within this tradition, however, this article goes beyond typology and analyzes the conditions

under which the state can succeed in building such linkages and facilitate the upgrading and innovation of domestic producers. The comparisons suggest that keeping the technological gap between foreign and domestic producers at a manageable level is crucial for nurturing local upgrading incentives and capacities, as the configuration of local production in such a situation provides both more learning opportunities and upgrading space for domestic producers. By contrast, a direct “leapfrog” to the leading MNCs that have a substantial technology gap with local producers is likely to trigger group-offshoring strategies and to shrink the upgrading space of domestic firms.

Industrial upgrading today is a new game facing the catch-up economies of the current generation of developing countries, such as China, India, and Brazil, which are major recipients of inward FDI and at the same time large economies that strive to upgrade their manufacturing industries. On the one hand, the current generation has been increasingly integrated into a global economic system dominated by concerns for achieving cost-efficient production. On the other hand, the national agenda of industrial upgrading seeks to ultimately harness the opportunities of global production for domestic benefits. The interaction of the global system and national industrial policies may produce a whole set of opportunities and pitfalls for domestic businesses at the local level. Despite the varied developmental contexts, upgrading always entails helping domestic businesses to exit the trap at the bottom of the value chain and finding ways to alter the hierarchical order of global production. The state remains an important player in the upgrading game, but to understand the success or failure of achieving economic transformation—as this study seeks to do—one has to go beyond national policies to examine the context of production that profoundly shapes the incentives of businesses at the local level.

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Notes

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52. Interviews JS 059, JS 062, JS 063.
53. Interviews JS 079, JS 074, JS 082, JS 084, JS 093, JS 097, JS 102, JS 105.
54. Interviews JS 049, JS 067, JS 062, JS 064, JS 069.
55. Interviews JS 073, JS 081, JS 083.
56. This tendency at the higher management level to expand horizontally often created tension with the technicians in the R&D department, who favored moving up vertically. However, the former almost always won the debate and the upgrading initiatives were largely quashed. Interviews JS 085, JS 090.
57. Interviews JS 027, JS 089, JS 091.
58. Wei, *Shenzhen Dianzi Xinxi*, 8.
59. Wei, Zhang, and Guo, *Zhidu Bianqian*, 5.
60. Zeng, “*Shenzhen Dianzi*,” 17.

61. As Barry Naughton points out, "Crucial in this process was the ability to link up with firms in Hong Kong and Taiwan and benefit from incoming investment from those sources." See Naughton, *The China Circle*, 29.
62. Interview GD 022.
63. Interview GD 008, GD 009, GD 013; Mingtian Xu, *Chuntian De Gushi: Shenzhen Chuangye Shi* [The Story of Spring: The History of Starting Businesses in Shenzhen], vol. 2 (Beijing: China CITIC Press, 2009).
64. Interview GD 022.
65. Mingtian Xu, *Chuntian De Gushi*, vol. 1 (2008)153-54; Dazhi Wei, *Shenzhen Dianzi Xinxi Chanye*, 245-46; Jin, *Shenzhen Keji Chanye Shi*, 9-10.
66. Interview GD 033, GD 042, GD 028.
67. Jin, *Shenzhen Keji Chanye Shi*, 17.
68. Interview GD 023, GD 007.
69. Interview GD 025.
70. For another example of taking advantage of domestic markets for upgrading, see Loren Brandt and Eric Thun, "The Fight for the Middle: Upgrading, Competition, and Industrial Development in China," *World Development* 38, no. 11 (2010): 1555-74.
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73. Interview GD 010, GD 021.
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