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# Industrial clusters in China: Policy tools for further and more balanced development

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This paper is aimed to provide some considerations about clusters in China as policy tools useful both to boost industrialization and to achieve wider policy goals. More precisely, cluster initiatives can effectively contribute to a balanced development, compensating economic and social bias induced by rapid growth, due to their characteristics and, particularly, their “bottom-up” features.

China, Clusters, Balanced Development, Policy, Reform

## 1. Introduction

This paper is aimed to provide some considerations about clusters in China as policy tools useful both to boost industrialization and to achieve wider policy goals. More precisely, cluster initiatives can effectively contribute to a balanced development, compensating economic and social bias induced by rapid growth, due to their characteristics and, particularly, their “bottom-up” features.

In order to better understand the subject the paper focuses on, Section 2 introduces a taxonomy of industrial clusters for the Chinese case, mainly based on the literature and some technical contributions by the World Bank. After industrial clusters and other local agglomeration policy tools have been distinguished, Section 3 will describe the geographical distribution of industrial clusters in China and briefly depict the main reasons of their localization. According to the features of Chinese clusters and basic topics of the literature about industrial districts, Section 4 faces the distinction between top-down and bottom-up policy approach in the Chinese context, also considering why there is a need for a “mixed approach” as introduced in some World Bank contributions (Zeng, 2010). Finally, Section 5 suggests some final remarks about the role of industrial clusters as policy tools for broader goals exploiting economic, political and social opportunities to shape balanced development paths.

## 2. Industrial clusters: taxonomy for the Chinese case

Industrial clusters are widely discussed in the literature. This notion is really widespread in industrial organization, but sometimes it is not properly used, referring also to other industrial policy tools (Zeng, 2010). Clusters supporting policies in China cannot be easily distinguished from more general SMEs supporting tools. In fact, many the most common cluster policies, such as the supply of services, consultancy and training to firms, the improvement of SMEs specialization and cooperation, the technological upgrade and the approach to the international market, are summed up in the law on SMEs stated in the 2002. Nonetheless, these tools are also combined to other ones with a definitely deeper economic and social impact, such as urban planning and direct creation of industrial development conditions. For

this reason, it is important to clearly state what an industrial cluster is, particularly coping with a case study like China. In fact, local industrial agglomerations are still frequently adopted as development tools in China more than in other Developing Countries, driving growth in wide areas. In this framework, attention has to be paid mainly to the distinction between special economic zones (SEZs), science parks and industrial clusters.

SEZs are defined as geographically delimited areas “with a single management or administration and a separate customs area (often duty free), where streamlined business procedures are applied and where firms physically located within the zone are eligible for certain benefits” (World Bank, 2010, p. 304). These benefits are essentially fiscal and financial (FIAS, 2008), but usually firms have also access to better infrastructure and services and also laws and regulations use to be more market friendly. These differences were higher especially at the beginning of the Chinese reform process. Today, instead, differences are much lower as demonstrated by the fact that foreign firms often prefer not to invest or to invest less in SEZs than in other areas of the country. In China, SEZs generally refer to some specific areas as Shenzhen, Zhuhai, Shantou, Xiamen, Hainan, Shanghai Pudong New Area, and Tianjin Binhai New Area (Zeng, 2010).

In contrast, science parks are agglomerations of physical infrastructures in the high-technological domain. This physical component is combined to “functional components” such as specific knowledge, services and financial providers “creating new business opportunities and adding value to mature companies, fostering entrepreneurship, incubating new innovative companies, generating knowledge-based jobs, and building attractive spaces for knowledge workers” (World Bank, 2010, p. 311).

Finally, clusters are “geographic concentrations of interconnected companies and institutions in a particular field” (Porter, 1998, p. 78). Several typologies of industrial clusters have been highlighted in the literature. For example, it is possible to distinguish between Marshallian industrial districts (and the Italianate variant), hub-and-spoke districts, satellite industrial platforms and state-anchored industrial districts (Markusen, 1996).

Although spatial links needed to really exploit externalities differ in each configuration (Yingming, 2010), connections between firms and institutions hold anyway as the characterising feature of industrial clusters. In fact, agglomeration is not enough to produce a competitive advantage, because “modern competition depends on productivity” and “productivity rests on how companies compete, not on the particular fields they compete in” (Porter, 1998, p. 80). Even if small and medium-sized enterprises specialised in the same production can compete with larger ones due to their localisation in the same place (Marshall and Marshall, 1879), firms within a cluster “create only the potential for the creation of economic value, rather than creating conditions which will inevitably lead to the creation of such value” (Liao, 2010, p. 161).

Institutions here are considered not only as formal entities, but also as common rules and habits embedded in specific social context (Hodgson, 2006). Such conventions can regulate the production relation within the cluster, with positive and sometimes negative outcomes (Granovetter, 1985). Indeed, clustering can generate second-best market solutions conditioning the regional development paths, as in the case of financing problems arising in less industrialised areas in China. “One key feature of industrial clustering observed in China is that an integrated production process is disaggregated into many small steps that are performed by a large number of small firms. By dividing a production process into incremental stages, a large lump-sum investment can be transformed into many small steps”. (Long and Zhang, 2011). This is the reason why industrial clusters have come across as one of the most important drivers of the country’s rapid development (Zeng, 2010).

Other distinguishing features of Chinese industrial clusters are as follows. First, in China “SEZs operate in more technology- and capital-intensive sectors, and enjoy greater

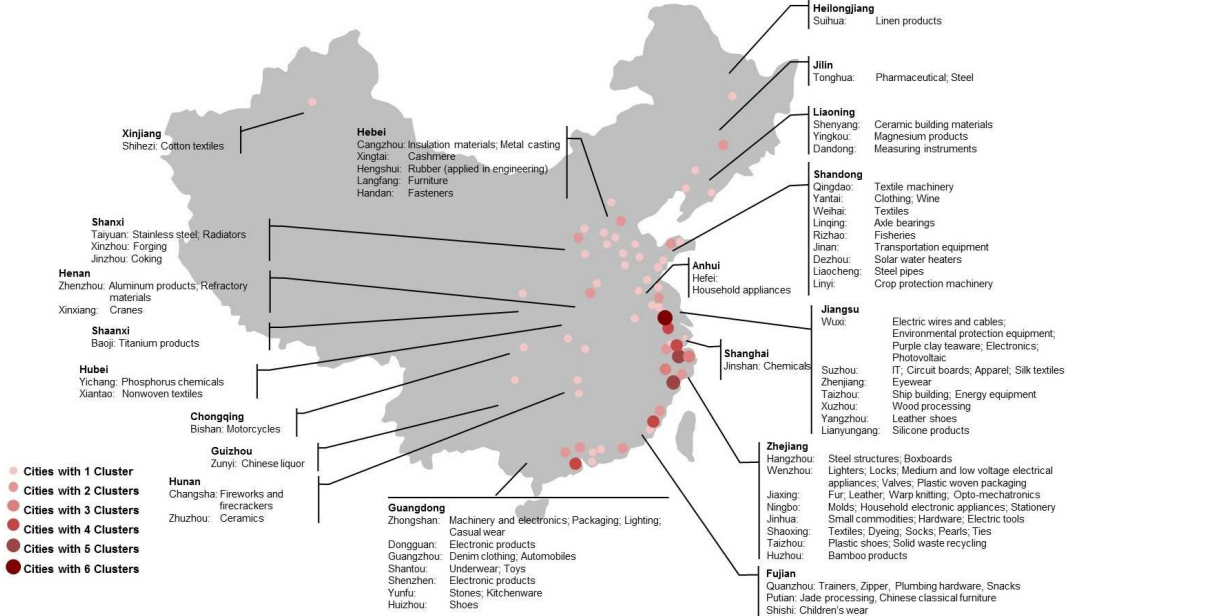
government support, more foreign direct investment (FDI), and stronger links to the global market” (Zeng, 2010, p. 8). Clusters, instead, operate in low technology and labour-intensive industries (Long and Zhang, 2011). Second, clusters have an industrial specialization that SEZs and science parks do not have. Third, clusters’ development is not necessary related to an urban one as in the case of science parks. Moreover, there is no physical infrastructure qualifying an industrial cluster. Finally, clusters do not follow any technology- or fiscal-driven development trajectory. Each one of these characteristics has its own relevance in determining the conditions for clusters development and their success in competition (World Bank, 2010).

### 3. The geographical distribution of industrial clusters in China

Because “clusters evolve, operate, and are “embedded” in specific geographic, cultural, social, regulatory, spatial, and institutional environments” (World Bank, 2010, p. 319), localisation- and institutions-related aspects cannot be overlooked in this analysis.

The FIGURE below shows the geographical distribution of industrial clusters in China and their industrial specialization. Chinese clusters are mainly localised in the Eastern area of the Country and their concentration grows, moving towards Southeast. The biggest agglomerations of clusters are mainly located in the Provinces of Jiangsu, Shanghai, Zhejiang, Fujian and Guangdong, areas where the GDP per capita is generally higher than the national average (Wang and Mei, 2009). Following the “Go West” policy that aims at favouring the development of the central provinces of China, some clusters are also developing in this area.

FIGURE. Map of 100 most relevant clusters in China



Source: Li & Fung Research Centre

Chinese industrialization policies started at the end of the Seventies have focused on the costal area, that could have catalysed public investment trough a close proximity to free-trade zones and wider export opportunities (World Bank, 2009; World Bank, 2010). As in the case of electronic products in Shenzhen (Guangdong), some clusters have been generated by the sole exploitation of the industrial capabilities provided by SEZs experiences (Zeng, 2010). Moreover, the industrial and trade advantages developed through time in the area undoubtedly have become propitious factors also for that largest number of clusters spontaneously born and autonomously operating in several sectors (Wang and Mei, 2009; Zeng, 2010).

All these industrial features of the clustering geography in China are not negligible in order to understand the paths of local development, because “the extreme diversity among China’s disparate regions adds a geographic dimension to the process of capability building” (Rawski,

2005, p. 4). In particular, the first clusters, as defined above, were mainly operating in traditional industries such as textile, leatherwear, furniture and metal products and emerged in the Provinces of Guangdong and Zhejiang (Wang and Yue, 2010), where the local manufacturing traditions, the historical trade opportunities and government intervention contributed to the area's more rapid growth.

#### 4. Top-down and bottom-up policy approach in Chinese clusters: what is not similar to other clusters' experience?

SEZs and science parks are typical top-down industrial policy initiatives, each designed and implemented in order to achieve broad development goals. On the one hand, SEZs are mainly aimed at attracting FDI creating new industrial and employment opportunities, but they can also generate indirect benefits such as “upgrading the skills of the workforce and management, technology transfer, (...) export diversification that enhances the trade efficiency of the domestic firms, and knowledge of international markets” (World Bank, 2010, p. 305). On the other hand, science parks are essentially created “for developing local capacity for innovation and for creating employment for tertiary and technical graduates” (World Bank, 2010, p. 310). Nonetheless, the main features of this kind of policy initiatives are more deeply driven by the central government in China than in other countries in order to generate both the conditions and the incentives to industrial development. In the case of the ZJHT park in Shanghai, for example, the most part of the actions, such as planning, investment, training and even the evolution processes, has been planned by the central government for compensating a missing entrepreneurship, especially in the case of biotech by the support of the National Shanghai Biotechnology and Pharmaceutical Industry Base (Su and Hung, 2009).

Nonetheless, these two types of local industrial agglomeration are often ineffective in reaching the policy targets. These policy experiences often end up in “empty boxes”, i.e. industrial areas that are not integrated to the rest of the local economy, precisely because of their top-down feature. SEZs and science parks require backward linkages horizontally (Johansson and Nilsson, 1997) and/or vertically (through the supply chain; Lall, 1980) transmitting positive spillovers to firms located outside the area for this policy to be effective.

When policy initiatives are driven by a central government, it could happen that some of these links to the local productive system are missing, due to a lack of embeddedness in the industrial agglomeration. Indeed, one of the most positive SEZs experiences in China is the one located in Shenzhen, because it has been able to improve the competitiveness of the domestic firms' ICT cluster located close to the area with the support of wider economic reforms and liberalizations introduced by the central government (Leong, 2007; World Bank, 2010). Nonetheless, sometimes high-tech cluster can successfully developed also a mix of clusters and non-clusters externality as in the case of the mobile TLC manufacturing in the Beijing area. Here, in fact, the cluster formation process has been driven by the settlement of a transnational corporation as NOKIA that has created new market opportunities and based on a relational proximity (Yeung et al., 2006).

In contrast, industrial clusters are generally considered a bottom-up process where the intervention of local and central institutions take place in order to support growth, to increase productivity and to help firms in specific and strategic issues like the skill-upgrade of the workforce, R&D activities, market access, etc. However, policy interventions often occur only after a cluster has been formed. In fact, according to both the literature and technical reporting, cluster's formation is a process that is effective and robust more when driven by serendipity than when “engineered” by industrial planning (Brookings Institution, 2006; Yusuf, 2008). The main reason concerns “the futility of ‘recipes for success’ based on ‘success stories’” (World Bank, 2010, p. 319). However, this is not always the case in China.

Some industrial clusters have developed without a specific State aid in a traditional bottom-up framework, mainly following either a manufacturing specialisation rooted in local history or exploiting business opportunities provided by the economic reforms and market opening. This is the case of some areas of China and especially the Coastal Provinces. For example, the textile industry in Xiqiao (Guangdong) was prosperous already during the Tang Dynasty (618-907 AD) and more than one thousand factories were created during the 1980s by dismissed workers moving from restructuring state-owned enterprises to private entrepreneurship (Wang and Yue, 2010). In the same way, the footwear industry in Wenzhou (Zhejiang) has a long history starting in 422 AD and experienced a proliferation of family businesses exploiting the new opportunities provided by the economic and political reforms at the end of the 1970s (Wang, 2010).

Chinese clusters therefore show some similarities with other experiences of industrial agglomeration. For example, the Italian districts often originated spontaneously, exploiting specific natural resources or local socio-economic conditions, growing around a large firm or replacing it (Poma, 2003) and compensating the lack of both financial capital endowment and governmental stability. However, in all these processes the main element is the endowment of informal social and institutional capital generated by the spontaneous agglomeration and providing the concrete capabilities to exploit positive externalities performing a competitive advantage. This is what cannot be provided by any policy and what Marshall called “industrial atmosphere” (Marshall and Marshall, 1879).

Nonetheless, if compared to industrial clusters in other part of the world and, in particular, to those ones located in the Advanced Countries, Chinese clusters are different in such a way (Shi and Ganne, 2009) and they are anyway characterized by a stronger role of public institutions (Zeng, 2010). Investments in infrastructures such as railways, motorways, electric grids, and the supply of services such as specialised schools, research and innovation centres, markets aggregating local productions, bank loans, not only shaped the clusters’ growth processes, but also provided the conditions for clustering. Recalling the examples cited above, the spontaneous development of the Wenzhou footwear cluster was followed by a phase of government-induced clustering. Thus the local administration of Wenzhou has played an active role providing the needed infrastructures and instituting development policies (Wang, 2010) in the 1990s. In the Xiqiao textile cluster “in 1986 (...) the town government coordinated the stakeholders and established the Southern Textile Market” (Wang and Yue, 2010, p. 198) in order to structure the aggregation of producers. Something very similar occurred also in Zhili in the Province of Zhejiang (Fleisher et al., 2010) and in Foshan (Guangdong). Especially, here the local Govern heavily supported the development of a ceramic tiles industrial cluster, that originated from the presence of some SOEs helping firms with new infrastructures, exhibition/trade centres, a favourable legislation on environmental issues (or to be more precise a weak enforcement of the law), etc. (Prodi, 2006). The case of Foshan is very interesting because, after 30 years of fast development of the ceramic tiles industry, the local Govern decide to consider not strategic anymore this industry, that is too polluting and not enough value adding compared to other industries developing in other close areas. This practically meant less governmental support and a more binding respect of the laws. As a consequence, in a few years many ceramic tiles firms had to close and many other decided to move in different places. We cannot say that this district is actually collapsing but it is losing position and showing how important was government support for industrial activities.

Another kind of clusters has been originated in a more policy-driven way and has developed from the presence of large Collective Owned Enterprises or State Owned Enterprises (SOEs), but they represent something different from both “satellite industrial platforms” and “State-anchored industrial districts” as defined in the literature (Markusen,

1996). The reason is that their origin is strictly related to China's access to the international market dynamics (Zeng, 2010). Some clusters indeed developed through privatizations, sometime SOEs were catalyst for private investments, but anyway this group of clusters has a typical top-down origin. In these cases, local governments attract firms operating in a specific industry providing fiscal incentives, production infrastructures and financial support. As a result, clusters are a mix of new born enterprises and firms originated in other parts of China or, more frequently, in foreign countries.

Although "top-down clusters" are not the most common ones, they however contribute to the rapid growth of China (Yuan et al., 2010). In addition, their features help to better understand the combination of industrial paths and vertical policy interventions that also characterises spontaneous clusters, even if in a more fuzzy way. In fact, "while market forces are usually responsible for initially producing industrial clusters, the government supports or facilitates them in various ways, including setting up an industrial park on the basis of an existing cluster" (Zeng, 2010, p. 7). In this sense, "bottom-up" and "top-down" categories could not be enough to distinguish between what the literature defines as "endogenous" and "exogenous" clusters respectively (Wang and Yue, 2010). Maybe a mixture of bottom-up and top-down approaches to clustering could better fit the Chinese case (Zeng, 2010). This is the reason why the bottom-up clusters can also be considered as industrial policy tools useful to achieve wider economic and social goals in China.

## 5. Industrial clusters as policy tools for balanced development: some final remarks

The previous sections have shown that policy intervention on clustering has an important role in China in pulling out the dormant industrial capabilities or, in other words, "to exploit informal institutional capital (i.e. trust and cooperation) to help change the mindsets of both public and private sector agents" (World Bank, 2009, p. 7). Moreover, in the last stage of clusters' development industrial policies have become fundamental in order to improve firms' competitiveness (World Bank, 2010), mainly by upgrading skills of the workforce, moving production to more capital-intensive methods and providing technological-intensive services as in the case of the Southern Technology Innovation Centre in Xiqiao (Wang and Yue, 2010).

In addition, industrial clusters can be considered not only as a policy target, but also as a wide development tool. In fact, the Chinese government must at the same time continue supporting rapid economic growth and manage its impact guarantying social stability that could be potentially endangered by geographic and interpersonal income unbalances. Therefore, rather than sustaining only growth, it is appropriate to wonder whether industrial clusters, as defined here, are able to support diffuse economic development more than top-down or purely exogenous industrial agglomerations. More precisely: "if clusters themselves do not have explicit equity goals, can public policies aimed at achieving economic equity be more effective if moulded to fit into current cluster strategies?" (Rosenfeld, 2002, p. 9).

The answer to this question lies in the identification of the opportunities created by industrial clusters, which are primarily of an economic nature. Industrial clusters indeed allow further endogenous development, because "geographical proximity and regional agglomeration may greatly facilitate the 'learning economy'" (Wang, 2010, p. 152). In such a sense, this can be a new step in the "Go West" policies started in the mid-1980s (Holbig, 2004), smoothing the already-mentioned risks of the forced technological and capital building processes.

The second type of opportunities offered by clusters are social. The improvement in the skills of the workforce generates social opportunities (World Bank, 2010), not only due to planned education and training programs, but also to the incremental exploitation of the

informal social capital cumulated by establishing interconnections among the relations of production. This is especially the case of benefits generated by the intra-industry and intra-clusters mobility of high-skilled workforces, both strengthening the network relations among firms by the creation of new horizontal linkages (Thompson, 2002) and increasing the capabilities to attract FDIs by the accumulation of the human capital needed, for example, to manage the production technologies (Xu, 2000). Moreover, the wage increase caused by economic growth and related to the skill-level of the labour force is more sustainable in the case of endogenous clustering, because it does not displace one of other main conditions of attractiveness for exogenous industrial development.

Lastly, clusters also allow political opportunities. The political dimension of growth is indeed one of the key issues in a centrally planned economy, even more so when the economic system has been opened to market dynamics. As described in the Wenzhou and Zhili cases, industrial clusters are mainly formed by small and medium enterprises that need to be coordinated in order to exploit industrial opportunities and improve development. Nonetheless, looking at firms as the main stakeholders in a centralised political context, policies focusing on endogenous clusters probably can not benefit from the advantages stated by the theory of collective action (Olson, 1965) in supporting the growth of the firm already established or in attracting larger firms. In fact, the central government could prefer to deal with fragmented counterparts in managing the fragile equilibrium between the State and Market economies.

Consequently, clustering can also be a useful policy tool in order to make China able to face new development challenges, by pushing for a more balanced growth and shifting the main objective “from a sole pursuit of economic growth to a wider one that encompasses social development” (Yuan et al., 2010, p. 85).

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