

Government Policy and Firm Strategy in Southern China *Specialized Towns*: “Western Categories” and “Oriental Practices”

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Abstract:

This paper explores the relationship between local government policies and firm strategies in Southern China. In particular the analysis focuses on this relation by studying the experience of what the Guangdong Province Government has officially defined as “Specialized Towns” (STs): agglomeration of companies, working in spatial proximity and specialized in the production of one and/or few goods (Bellandi, Di Tommaso, 2005; Wang, 2001; Lu, 2003; Sonobe et al., 2002).

Local development policy and firm’s strategy in China have recently captured a growing interest of scholars, but few contributions have explored the relations between these two dimensions (Enright, 1998). The analysis starts with a review of the relevant literature (that has been produced both in China and in some western countries) but it is also supported by the results of fieldworks directly promoted by the authors.

In this framework, the paper focuses on the innovation policy promoted by the Guangdong Province Government in the context of its “Specialized Towns Program” (Department of Science and Technology of Guangdong Province Government, 2006a) and it investigates the influence of this policy on firm strategies of innovation.

With the support of specific town and firm case studies, we explore the experience of an area that has a tradition in experimenting industrial growth in *laboratories* and that is now clearly using STs as a tool for long term objectives of industrial development (Barbieri, Di Tommaso and Rubini, 2007). In the view of the provincial government it appears that STs can be developed under policy intervention in order to push innovation, industrial upgrading and a shift to more value added activities: the long-run success of the policy, though, depends on the extent to which firms respond to government suggestions and incentives.

These are issues that are clearly relevant not just for Guangdong, but that find in Guangdong a unique institutional setting, where “Western Categories” (such as “firm”, “policy”, etc.) are not so obvious when applied to “Oriental Practices”, and we believe this can make an interesting contribution for further researches at the border between government policies and business strategies.

Keywords: Government policy; Innovation Promotion; Firm Innovation Strategy; Specialized Town; Southern China (Guangdong)

1. Introduction

1.1 Preliminary notes. This analysis and more general questions

In the current Chinese debate on industrial development, there is a general consensus - both in the academic and in the policy making circles - on the efforts made by the Guangdong Province Government in the field of industrial upgrading and innovation. In particular many Chinese scholars (Wang, 2000a, 2000b, 2002a; Fu, 2002; Lu, 2006; DST, 2006; Yu and Wang, 2006; Huang and Hu, 2007). and some international observers (Eng, 1997; Christerson and Lever Tracy, 1997; Enright, 2005; Bellandi and Di Tommaso, 2004; Heikkila, 2007; Barbieri, Di Tommaso and Rubini, 2007) have focused their attention on the Government Policy in favor of the “Specialized Towns” (STs): urbanized realities officially recognized by the Province Government as “one-product-town” and characterized by the presence of high numbers of specialized firms and plants. In this framework, with this paper we would like to offer a further contribution on this research line in particular because we believe that STs are a relevant unit of analysis to investigate the linkages between Government intervention and Firm strategies. We will focus on innovation programs promoted by firms and local governments in order to limit the extent of our analysis. However, we also have in mind the target of inferring further suggestions able to guide our future research agenda on the relation between government and market forces in contemporary China

1.2 STs in Guangdong Province

Although the concept of “Specialised Town” was a new one in 2000, it stemmed from a previous government intervention for the promotion of economic development in rural areas. It was in fact based on the experience of a previous national program called “Spark Plan”, whose aim was to promote the development of rural China since 1986 (Lu, 2006a; Zhang, 2003; DST, 2006a). Within this program several “Spark Technology Investment Zones” were created and supported by national funds and bank credits. In Guangdong most of these zones later became specialized towns (for instance Datang in the prefecture of Shaoguan, Zhangcha and Pingzhou in Foshan, Fengxi in Chaozhou, Shilong in Dongguan). In the Nineties, experts appointed by the Department of Science and Technology (DST) of the Guangdong Province Government studying the Spark Technology Investment Zones noticed that in most cases the dominant phenomenon was that of “one town-one product” (Lu, 2006a). On the basis of these studies and with reference to some increasingly popular international experiences (like the ones of industrial districts, clusters, local innovation systems, etc.) Guangdong policy makers decided to invest in such industrial agglomerations: they officially launched the “Specialized Towns Technology Innovation Program” in 2000 with the aim of identifying a first group of towns to promote, and then they enlarged the program to several cities whose development is linked to specific industrial policy interventions (such as the creation of innovation centers to encourage technological upgrading) (DST, 2003; DST, 2006a). Up to 2003, 71 specialized towns were recognized by the Government. Up to 2007, 201 towns had been officially

recognized as specialized town. Today the program is still working and other towns are in the process of being labeled STs.

When a town applies to become part of the program, a panel of experts of the government verifies that a number of requirements are satisfied and in that case it awards the title of “specialized towns” and a number of specific advantages. The requisites are the following:

- the town has to be a “township” from an administrative point of view, or, less frequently, a “county” or a “urban district” and at least 30% of the industrial output (or employment) has to be concentrated in one industry (defined in specific sectoral terms, such as our 3 digit classification systems). This industry is called “specialized sector”¹;

- the annual value of industrial output has to be higher than 2 billion Yuan (equal to € 190.4 million);

According to our previous analysis (Barbieri, Di Tommaso, Rubini, 2007; Bellandi-Di Tommaso, 2005), in the framework of the Government ST development program we should recognize two phases.

In a first phase (2000-2003) the DST program mainly tried to rationalize the location choices of national and foreign firms that starting from the early Nineties had gradually invaded and then saturated the central area of the Province, between the metropolis of Hong Kong, Shenzhen, Guangzhou and Macao.

In a second phase (2003-2006) the program has been clearly utilized to promote objectives of territorial rebalancing, trying to foster the birth and development of specialized productive clusters also in peripheral areas characterized by a lower firm density and, more in general, by a lower GDP level. In this phase, in the wider context of industrial restructuring that the Guangdong Province is about to face, specialized towns become both a means to promote the local development of rural and marginal areas and a way to alleviate congestion problems that the Pearl River Delta region is experiencing.

In the following tables we provide a reliable picture on ST development based on official Government data: they provide some interesting evidences on the growth process of specialized towns in terms of contribution to provincial GDP, number of firms and employment (table 1 and 2) and on the innovation potential of these towns (table 3).

¹ One city can have more specialised sectors: Dachong for instance is specialised both in the production of Mahogany furniture and clothing, even if the former is predominant.

Table 1 - General data of STs in Guangdong (2001-2005)

Year	2001	2002	2003	2004	2005
number of ST	21	50	71	103	159
GDP	440.69	976.10	1467.12	2280.15	4658.32
(%) percentage of total provincial GDP	4.14	8.32	10.77	14.22	21.47
population(10,000)	148	351.5	549.9	850.3	1358.1
% of total provincial population	2.0	4.6	7.1	10.9	17.2
number of firms(10,000)	3.92	9.79	13.47	16.4	23. 9
number of firms in specialized sectors(10,000)	1.48	3.39	4.3	4.8	10.1
industrial value of specialized sectors(100,000,000RMB)	422.45	1271.38	1780.27	2693.65	4683.1

Source: DST and Statistics Bureau of Guangdong Province 2007

Table 2 - Development of STs in 2005

	Collective firms	Private firms	Hong Kong and Taiwan firms	FDI	total
number of firms in specialized sectors	998	77278	2805	886	100728
total industrial value (100,000,000RMB)	288.00	2366.19	741.73	410.25	4683.13
Tax(100,000,000RMB)	5.55	60.53	20.36	19.37	116.35
employees(10,000)	12.36	213.22	55.22	30.00	370.71
number of science and technology staff(10,000)	1.04	13.66	5.29	2.98	24.11

Source: DST and Statistics Bureau of Guangdong Province 2007

Table 3- Science and technology development in ST

	2001	2002	2003	2004	2005
number of STs	21	50	71	103	159
number of science and technology staff(10,000)	10.69	18.78	26.01	48.16	-
high-tech firms	68	257	336	513	688
input of town government to science and technology(10,000RMB)	13527	29525	41132	60004	61283
accumulated patents	2852	16289	23006	46101	49285

Source: DST and Statistics Bureau of Guangdong Province 2007

2. Government Innovation Policy Promoted in Guangdong

2.1 First phase from 2000 to 2005

The Government of Guangdong Province started promoting innovation in specialised towns in 2000 through two formal policy documents named “*Plan of the ST Technology Innovation Pilot Test*” and “*Managerial methods of the ST Technology Innovation Pilot Test*” (DST, 2008a). The core instruments of this policy were: (a) the identification of specialized towns at provincial level through a number of specific criteria and (b) the establishment of a “Technology Innovation Platform” in favor of the industrial development of these towns.

The innovation platform includes multiple functions: sector innovation promotion, R&D in industrial engineering technology, productivity promotion, production-study-researches, firm incubation, consultancy, information diffusion, development of commercial websites for the specialized sector and so on (Xie, 2003).

According to DST surveys, up to 2006, 108 specialized towns were endowed with an innovation platform (DST, 2008b). The platforms follows common targets but they can differ from town to town according to different forms of intervention and it is possible to identify three main forms of innovation platform (DST, 2008c).

1) The first form refers to the development of information networks that are used to disseminate technology, exchange commercial information and conduct virtual cooperation. These networks are mainly created through websites, access to online information or information centers.

2) The second form refers to innovation centers directly created or supported through funding by the local and the provincial government. In addition, some of this centers can gain financial support from other firms within the specialized town. It is the case for example of the Center of Cloth Platmaking in Xichao town (in Nanhai, Foshan) and the Center of Lamp Technology in Guzhen town (in Zhongshan).

3) The third form is somehow different from the first two: it refers to existing technology R&D centers in some leading firms in STs. According to the DST these centers were born thanks to the favorable and innovation-friendly local environment created by the DST policies. These firm based centers produce knowledge spillovers and therefore benefits for the sector and the town. For example, the technology development of Beijiao town (in Shunde, Foshan) was greatly benefited by the firm “Media”, a leading producer of home appliances.

2.2 Second phase from 2005 to 2006

After five-year of rapid development of STs, Guangdong government believed that there was a need to integrate more administrative resources to enforce the promotion of STs and stimulate the enthusiasm of different levels of governments in supporting technological innovation. As a result, Guangdong government, through the Department of Science and Technology, launched a new plan named “Coordinated Promotion Plan between Province and (prefecture) City” in May 2005 and promulgated one formal document named “*Guide for the*

Coordinated Promotion of ST” (Lin, 2006). The main tasks of this plan included: (1) integrating different kinds of technology resources to give support to the SMEs; (2) setting up strategies in human resources, patents and standards in order to improve the scale of the industry and build up local brands, (3) accelerating the agglomeration of firms and establishing specific industrial chains, (4) establishing new type of regional innovation systems.

These new tasks should be carried out through the already existing technology innovation platforms and innovation centers and by promoting new innovation centers where they are still missing. In other words the policy setting remains the same, but new tasks and a higher level of involvement from the city level government is encouraged. To this aim, 19 prefecture cities have signed agreements on the plan up to know. The only exceptions are Guangzhou and Shenzhen, where the phenomenon of specialized towns is less developed (Barbieri, Di Tommaso, and Rubini, 2007).

2.3 Third phase from 2006 to 2008

Even though one of the content of the innovation platform includes the cooperation with universities, the small number of universities located in the towns, especially in rural areas, limits the possible connections between firms in ST and universities. Thus, the 2005 provincial program with the national Ministry of Education named “*Cooperation Agreement on improving self-innovation capability and accelerating the economic and social development in Guangdong*” and aimed at strengthening the cooperation between universities and Guangdong governments was extended in 2006 to Specialized Towns under the name of “ST Production-Study- Research Special Plan”(Lin, 2007). The main instruments of the plan include: building demonstration cases in STs and organizing the collaboration alliances between STs and universities. Up till the end of 2006, there were three ST demonstration cases (Nanzhuang town in Foshan, Diancheng town in Maoming and Dazhe town in Meizhou) and six successfully established collaboration alliance between an ST and a University (Tangkeng town in Meizhou with South China University of Technology; Huangpu town in Zhongshan with South China University of Technology and South China Agriculture University; Leliu town in Shunde with China Geology University; Jun’an town in Shunde with Donghua University; Shiling town in Guangzhou with Sichuan University; and Dongcheng in Zhaoqing with South China University of Technology and Guangdong Industrial University (DST, 2007).

The potential of this last program is high in terms of capacity to promote innovation in Specialized Towns, however it is too recent to be included in the present analysis. Only a few towns are taking part in the program in an experimental way and few data are available. Whereas more information is available on the existence of an innovation platform and innovation centers in STs and therefore our analysis focuses primarily on these policies. As a whole, the above mentioned plans launched in three different periods of time constitute the core of ST technology innovation policy as it is also stated by the DTS in a formal document of 2006 “*Guangdong Province Government’s Suggestion on the Promotion of the*

Development of Specialized Towns”, which is up till now the most complete document on the policies for the development of specialized towns.

3. Government Policy and Firm Strategy for Innovation in Guangdong STs: The Literature

The relations between government policy and firm strategy within clusters need to be explored (Enright, 1998). Particularly in the context of specialized towns, few attempts have been made to study empirically the relationship between government policy and firm strategy, despite the increasing number of researches on ST competitiveness, government influence and a few theoretical contributions on firm strategy within a specialized town. We review the limited Chinese literature on the influence of the government on the innovation process of STs and on firm innovation behavior within STs in order to explore some possible connection between these two phenomena.

3.1 Government's influence on technology innovation in GD ST

After these years of policy implementation the efforts of Guangdong Government to promote innovation in its STs is evident. However if it is clear that these efforts have been made, very few are the evidences on the real influence of government policy on technology innovation. In order to collect some information on this, at the moment, two are the potential sources: Guangdong Government reports and few academic papers.

According to the DST the innovation policy has a clear and positive impact especially where the innovation centers have been created and five are the main channels through which government intervention has influenced the innovation process in STs (DST, 2006a): (a) It has promoted a technology innovation atmosphere and a friendly environment for firms within specialized towns; (b) It has accelerated the process of industrial upgrading in rural areas in Guangdong; (c) It has developed the information service sector in specialized towns; (d) It has helped create regional brands; (e) It has speeded up the process of urbanization.

Then, studying the few academic contributes we may refer to some scholars who have undertaken investigations and fieldworks in Guangdong STs. Qiu and Xu (2004) investigated thirteen specialized towns from 1999 to 2003 in Pearl River Delta (PRD)² and drew the following conclusions: (a) Technology innovation in the STs, especially those located in PRD, depended on the technology innovation centers founded by local governments. The main actor in innovation was the “Innovation center”. (b) The innovation center seemed to work as a functional department of local government and its function went beyond technology innovation promotion, including marketing, training and information broadcasting, exhibition

² including water heating facilities cluster in Shuikou in Jiangmen 1999; motorbike cluster in Pengjiang in Jiangmen 2003; rosewood furniture cluster in Dachong in Zhongshan 2003; ceramic cluster in Nanzhuang in Nanhai, Foshan 2003; electronics cluster in Qingxi in Dongguan in 2003; Section Aluminum cluster in Dali in Nanhai, Foshan in 2003; textile cluster in Xichao in Nanhai, Foshan 2003; hardware cluster in Jinsha in Nanhai; Electronics cluster in Songgang in Nanhai; shoemaking cluster in Pingzhou in Nanhai; underwear cluster in Yanbu in Nanhai 2003; toy cluster in Guanyao in Nanhai 2003; agriculture cluster in Heshun in Nanhai 2003

and so on. (c) The influence of local government shifted from a direct intervention, where governments acted as entrepreneurs, to an indirect role, where the government provided public goods for the whole industrial innovation. In their study, Qiu and Xu (2004) highlighted a general positive impact of government on ST technology innovation on the basis of interviews with people from firms and innovation centers, but also pointed out that many firms in STs had a passive attitude towards innovation centers, they were mainly accepting new technologies offered by the centre but had little involvement in their development. Qiu and Xu (2004) made an attempt to integrate the micro and the macro perspective by interviewing some firms and investigating their linkage with innovation centers, however the firm's response to innovation centre was not measured or taken as proxy of the response of firms to government policy.

Similarly, other contributions studied the influence of government by selecting case studies and looking at general town economic indicators. By and large these studies conclude that the government successfully promoted the innovation of firms in production, management and technology (Huang and Qiu, 2003; Zhang et al. , 2007; Chen and Hou, 2006). Using two cases of specialized towns³, Wang (2002b) suggested that in a traditional sector the government plays an important role in introducing external innovation sources for firms. The innovation center, set by the government and run as company, is a kind of external innovation source for firms, which builds up firm innovation capability. Further, the innovation center makes firms concentrate on their product differentiation and helps them build their own R&D centers. After these first steps, the function of the innovation center normally changes and it is restricted to training, maintenance, and information services⁴. In order to explain the impact of government intervention, Li (2002) introduced the "Local State Corporatism" theory (Jean Oi, 1997) into his analysis and considered the government as an entrepreneur that contributes to the growth of specialized town. According to the author, it was government's entrepreneurship that promoted the entrepreneurial spirit of firms within specialized towns, which finally led firm to carry out learning and innovation activities.

3.2 Firm innovation behavior in Guangdong STs

There is a substantial body of literature on firms' internal innovation strategy and behavior in China (Wan et. al, 2000; Bao et. al, 2006; Fang and Sun, 2007; Deng and Xu, 2007; Xu et. al, 2008; Long and Chang, 2008). However firms' innovation behavior within Chinese clusters or Guangdong specialized towns is something that has not been studied in depth and from a micro perspective by the Chinese literature⁵. The literature on this topic prefers to classify the firm innovation behavior into categories: Li (2002) classifies the firm behavior into two categories according to firm size: large firms' behavior and SMEs' behavior. The relatively large firms' behavior depends on the individual capability to create new products, to

³ The two cases were Xichao town in Nanhai, Foshan and Xiaolan town in Zhongshan.

⁴ Wang (2002) gave evidence from the case of Xiaolan town to support this conclusion.

⁵ Only a few theoretical researches used game theory to analyze firm possible behaviors (Liu and Yang, 2002; Luo and Liu, 2004; Tang and Wang, 2005; Gao, 2006; Zhu, 2007; Chen and Li, 2007), but they have not been applied to any case study.

improve product quality and to capture resources needed for development. On the contrary, SMEs rely more on collective learning and government associations. Li (2002) further explains that in the primary stage of development in STs, most firms' innovation strategy is to imitate and learn from others. With the development of a market in STs, firms gain technology innovation capability through collective learning and the help of innovation centers built by the government, and they no longer need to imitate.

By investigating firms in STs, Yue (2007) summarizes four kinds of firm innovation behavior within STs. 1) the first type of behavior, based on the evidence from the leather sector in the ST of Shiling in Guangzhou, refers to collaborative R&D with suppliers or some other relevant firms; 2) the second type of behavior, based on the evidence from the motorbike sector in the ST of Pengjiang in Jiangmen, refers to the cooperation between subcontractors and a large firm; 3) in the third type, based on the evidence from the textile sector in the ST of Xichao in Foshan, firms depend on the innovation center built by the government. Some firms set up their own R&D center after they have benefited from the innovation center, and self-innovation strategy becomes the major innovation strategy; 4) the fourth type refers to learning from foreign customers.

Contrary to what the above mentioned literature seems to suggest, Qiu and Xu (2004) when exploring firms' behavior, put their initial attention on the innovation centers and showed that firms often do not take part in the planning and designing of new technologies and have a little influence on innovation centers. That is, they have a low degree of cooperation with the innovation center.

Therefore, the existing literature seems to provide contradictory evidence on the linkage between firms' strategy and innovation centers. As a whole, the linkages between firm's innovation strategy and firms' response to the whole government innovation policy in Guangdong seem still highly unexplored.

4. Methodology

4.1 *The Research Question*

The brief survey of the last two paragraphs reveals that, so far, academic contributions have focused, on the one hand, on the policies promoted by different levels of government to favor innovation and, on the other, on firms' choices in terms of innovation strategies. However, little research seems to have focused on the relationship between the two forces. That is, there seems to be a gap between studies referring to business and management economics and those referring to government policy. We would like to investigate exactly what lies in the middle of the two disciplines.

In this context, the research question of this paper is: government policy exists, but is the firm's strategy influenced by government policy?

We begin to address this question by searching for some measures or proxies of firms' reaction to government policy, in particular in the field of innovation. We also search for evidence of a relationship between firms' choices and the degree of strength of government action. In doing so, we assume that the firm's response to the innovation policy depends upon the strength of the policy (that is the amount of incentives offered by the government), as well as on the channels through which the government can influence firms' choices.

At this first stage of analysis we investigate the existence of correlations among the variables, although from a logic point of view we can infer some causal directions in the correlations. Future researches will proceed in testing the relationship between firms' responses to policy and their determinants through more complex rigorous analysis.

4.2 *Research setting and framework*

As we mentioned in section 2 we focus on the "*Plan of the ST Technology Innovation Pilot Test*" as it is the main policy favoring innovation in STs and it has been launched for more than six years with clear instruments.

Second, for the present study we limit our analysis to the leading firms in each ST. Their response to the government policy can be traced more easily from multiple information sources, whereas data referring to innovation activities of small or marginal firms are seldom available. Moreover, we believe that the innovation choices of leading firms inside STs can have a great influence on the innovation performance of the whole town. According to the definition of firm innovation strategy within a cluster advanced by Enright (1998), whether to innovate individually or in collaboration with other firms within a cluster (through for instance innovation centers) is the main strategic innovation decision. Therefore, we investigated the degree of response by leading firms to the innovation platform and/or innovation center as the proxy of the overall firm's innovation strategy within specialized towns.

As we anticipated, when considering a firm's strategic behavior in the interaction with government, some elements should not be ignored. These refer to the possible influence of the

government on firms' choices. We believe that this influence can be exerted at least through two channels: ownership (Hoskisson et. al, 2002) and linkage of the entrepreneur with government both in terms of his/her background and present position (Lan, 2004). (1) Different types of ownership ranging from state-owned enterprises (SOE), town village enterprises (TVE), private firms to international joint ventures (IJV) reveal different degrees of connection between the government and the firm. In China SOE' behavior is widely influenced by the view of national or local governments on such important decisions as the appointment of top management team, approval of long-term strategy and so on. To some extent, SOEs inherit some government functions (Yin et al., 2004). Meanwhile, private firms and foreign firms show less control by the government and more independence in strategic decision. Thus, the control exerted by a dominant equity in ownership can influence the response of firm's innovation strategy to government innovation policy. (2) Additionally, an entrepreneur's linkage with the government and policy-making also have an influence on the strategic decision in that such linkage produces the 'dominant general management logic', which is defined as the way in which managers conceptualize the business and make critical resource allocation decisions in their firm (Prahalad and Bettis, 1986:490).

We thereby set up our framework of the relationship between the strength of government policy and the extent of firms' response in specialized towns, considering also the two factors of ownership of the firm and entrepreneur's linkage with the government.

4.3 Measures

1) Leading firms in STs

First of all, we developed six criteria to identify "leading" firms within a specialized town. A "leading" firm should be outstanding compared with other firms located in the same specialized town according to some common criteria that we defined on the basis of the official website of DST and of our knowledge from previous fieldworks. We selected firms that meet at least one of the following criteria:

- (1) the firm is among the top 500 companies in the national/global market according to sales or among the top 10 companies in the national/global market according to market share;
- (2) the firm is among the top 100 companies in a specific sector in the national/global market according to sales;
- (3) its brand is formally registered by a national bureau or by the Guangdong province as a famous brand;
- (4) the firm is one of the largest in the specialized town according to latest annual sales;
- (5) it is one of the largest firms in the specialized town according to latest annual exports;
- (6) it is recognized as the leading firm by the local government from official documents.

The first two criteria show that the firm is leading at the national or global level, which certainly means that it is leading also at the town level; the third criterion shows the firm's leading position at provincial level; the last three criteria represent the firm's leading position

at town level.

2) Government policy

We explained government programs for innovation in section 2.1. With reference to our ST sample, all the towns have an innovation platform (of the first form), but only some towns also have an innovation centre (platform of the second form).

From the point of view of government's involvement, where an innovation center is created the intention to promote innovation is also matched with a specific investment from the government. In this case we can say that the government policy for innovation is stronger.

As for the third form of platform explained in paragraph 2.1 the DST assumes that firms' R&D centers have been developed thanks to the existence of a policy for innovation and to the consequent general atmosphere encouraging innovation. This linkage could be also true but at the same time it looks too vague. This is why we classify R&D centers born within the firm not as a policy but as a firm strategy (that in the best scenario is influenced by the policy).

So, the variable taken as a proxy of the strength of government policy is ordinal and has two possible outcomes: innovation platform (0) or innovation platform with an innovation centre (1).

3) Firm's strategic response

Firms' strategic response to a specific government policy is so unique that we could only identify the response through pilot samples and then classify them into some categories. Our process of identification refers to the "structured content analysis", raised by Miller and Friesen (1977) and Jauch, Osborn, and Martin (1980) and ever undertaken by Chen and Macmillan (1992) to measure the firm's actions and response in competitive moves.

In the pilot test, we first selected nine specialized towns that have an innovation platform and an innovation center from the official website of the DST. We then selected nine leading firms according to the above mentioned criteria.

As a next step, we carried out an extensive search from different government official sources and firms' formal sources and identified the response directly related to the government innovation policy. As we mentioned above, the firm's choice of applying for their internal R&D center to be registered by the government should be considered as a kind of firm's response instead of a direct instrument of government policy. The process of tracing responses is complex and distinguishes firm response by looking for such key words as "recommended", "membership", "cooperation project", "collaboratively build" and so on. We met some cases that had no evidence whatsoever of a firm's response to the government innovation policy. Therefore, we ranked different responses according to their degree of concrete action and classified the responses into 7 categories represented in Table 1. These 7 categories were used to build an ordinal variable ranging from 1 to 7 where "1" represented the lowest degree of response while "7" represented the highest degree of response.

4) *Government Control*

a. *Ownership*

The ownership structure is measured by the identity and share of the largest owner. In China, there are three main ownership structures: government owned, private owned and foreign owned. We thus classified our samples into three main categories with clear recognition. (a) The government owned firms include the following seven types of firms: state-owned enterprise (SOEs) at national level⁶, SOEs at provincial level, SOEs at prefecture level, town village enterprises (TVEs), native joint venture (JV) dominated by SOEs (at any level), listed company dominated by SOEs and international JV (IJV) dominated by Chinese SOEs. (b) The private owned firms include the following four forms: native JV dominated by private firms, listed company dominated by private firms, private firms and IJV dominated by Chinese private firms. (c) The foreign owned firms refer to the following two forms: IJV dominated by private foreign firm and wholly owned by foreign firm.

b. *Entrepreneur's linkage with the government*

Entrepreneur's linkage with the government is measured as follows: (a) the entrepreneur is the deputy of different levels of the legislature (NPC-National People's Congress), or a deputy of the local Committee of the Chinese People's Political Consultative Conference (CPPCC); (b) he/she is a government official. If one of these conditions is satisfied, we say that the entrepreneur is linked to government.

Given that both the two dimensions "ownership structure" and "entrepreneur's linkage with government" approximate the chances of governments to influence or control the firm's strategies, we combined them into one variable named "government control". We measured this ordinal variable in five categories to represent different degrees of control (see table 4). The assumption is that when both conditions "state owned" and "entrepreneur's linkage with the government" are satisfied the chances of government control over firms' strategic decisions increase. This chances should decrease when one or both the conditions are not satisfied. Our ordinal variable is therefore labeled from 1 to 5 where "1" represents the lowest degree of control (foreign firm with no linkage between the entrepreneur and the government) and "5" represents the highest degree of control (SOEs with entrepreneur's linkage with the government).

⁶ In China, SOEs are different because they are controlled by different levels of governments.

Table 4. List of variables

Name of variable	Type of variable	Variable values
Government policy	Ordinal	0= the town has an innovation platform (lower strength of government policy) 1= the town has an innovation platform and an innovation center (higher strength of government policy)
Firm strategic response to government policy	Ordinal	1= No evidence of response. 2= The firm is recommended by the innovation platform (or by innovation center) as a model for innovation and quality of production, but there is no clear cooperation between them. 3= The firm's internal R&D center was registered by the Guangdong Province 4= The firm is a member of the innovation platform or of the innovation center where it exists 5= The firm has a real cooperation project with the innovation platform or with the innovation center where it exists 6= The firm accepted training by the innovation platform or by the innovation center where it exists 7= The firm internal R&D center is recognized as the innovation center of the town or was jointly built with the government.
Government control	Ordinal	1= foreign firm with no entrepreneur's linkage with government ⁷ 2= private firm with no entrepreneur's linkage with government 3= private firm with entrepreneur's linkage with government 4= SOE with no entrepreneur's linkage with government 5= SOE with entrepreneur's linkage with government

4.4 Data collection

In this study, we concentrate on the leading firms located in those specialized towns where the government has launched an innovation platform. According to the latest official information released by DST, we found a list of 108 innovation platforms updated on Nov. 15, 2006⁸. These 108 innovation platforms are located in 105 specialized towns, which means there are a few towns displaying more than one innovation platform. In particular, Lunjiao

⁷ There is no foreign firm whose entrepreneur has a background or present position related to government.

⁸ <http://www.zhyz.gov.cn>

town (in Shunde, Foshan), Longjiang town (in Shunde, Foshan) and Nantou town (in Zhongshan) have two innovation platforms. In addition:

- (a) one town in the list is not a specialized town (Yanghe town in Gaoming, Foshan);
- (b) two innovation platforms are not specialized in the registered sector by DST (Guicheng town in Nanhai Foshan is registered in mechanical equipment, but the innovation platform is in shoes; Genghe town in Gaoming Foshan is registered in stainless steel manufacturing sector, but the innovation platform is in fish breeding and poultry raising.)

Therefore, we decided to delete the above three specialized towns from our dataset. We remain with 102 specialized towns that have at least an innovation platform.

In selecting our sample firms from the 102 specialized towns, we looked at publications (Zhu, 2005), public official websites of the DST, official websites of different levels of governments⁹, official websites of innovation platforms (or innovation centers) and website of the possible firms. We used different reliable sources to make sure that the cases we selected were leading firms. We excluded those that had not enough evidence to show that they were leading in any of the five criteria. As a result, we got 95 leading firms in 95 specialized towns as our final sample.

The data for the 95 firms were collected through publications on specialized towns in Guangdong updated till January 2008 through the same reliable sources above mentioned. Additionally, we confirmed the data of the sample firms through the company dataset Alibaba¹⁰, that is a global premier e-commerce online marketplace for global and domestic China trade that has a large amount of data for Chinese firms. As a result, we got reliable information on the sample firms' ownership structure and entrepreneur's specific linkage with the government, along with the information concerning the innovation platform and innovation center. We then coded all these information according to the definition of variables of table 4.

As we described in our pilot test, we used a "structured content analysis" to identify firm response for the 95 sample firms. When a firm displayed several responses to the government policy, we only considered the highest degree of response. When we could not find any type of evidence from the above mentioned information sources as well as from news reports we coded the response as "1": no evidence of response.

5. Data Analysis

A first look at the frequency distributions of the variables we analyzed can clarify the main features of our sample.

Figure 1 shows a quite even distribution of the variable "government policy". Provided that all selected towns have an innovation platform, 47 firms out of 95 are in a town that has also an innovation centre as a policy instrument.

The frequency distribution of the variable "government control" is less even, since most

⁹ Here, the different level of governments includes town level, county level and prefecture city level governments.

¹⁰ <http://www.alibaba.com/> and <http://china.alibaba.com/>

of the firms are private, and in particular private and not related to the government through the entrepreneur’s background or present position. This is in line with the more general distribution of ownership structure in specialized towns. As it is shown in the introduction (table 2), most firms in STs are private or foreign owned.

Figure 3 shows the frequencies of firms’ response to government innovation policy. Most firms gave no evidence of response, or evidence of a low cooperation with the innovation centers. However, on the opposite side, there are several cases where the firm R&D centre is actually the innovation centre of the town. These are cases of perfect identification of government policy and firm choices in terms of innovation strategy.

As a whole we seem to have a picture of low firms’ response to the policy and low government control over firms’ strategies.

Figure 1. Frequency distribution of Government Policy

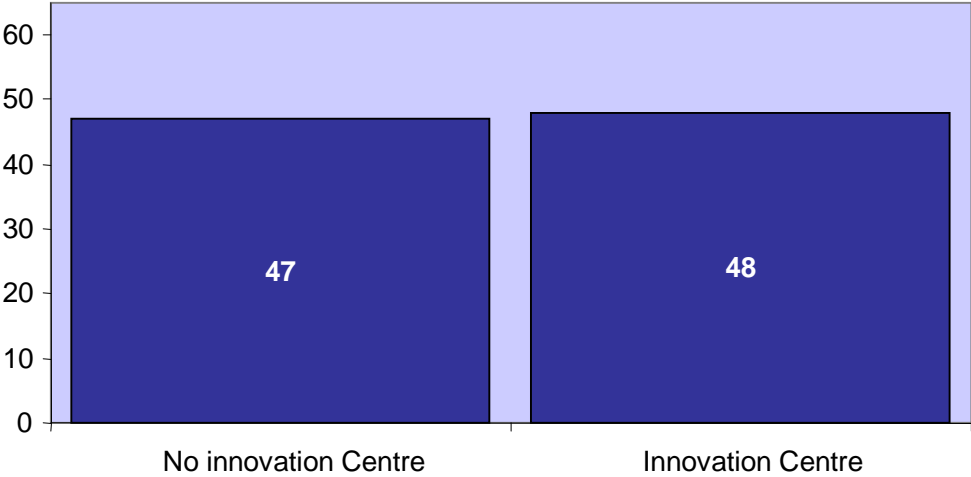


Figure 2. Frequency distribution of Government Control

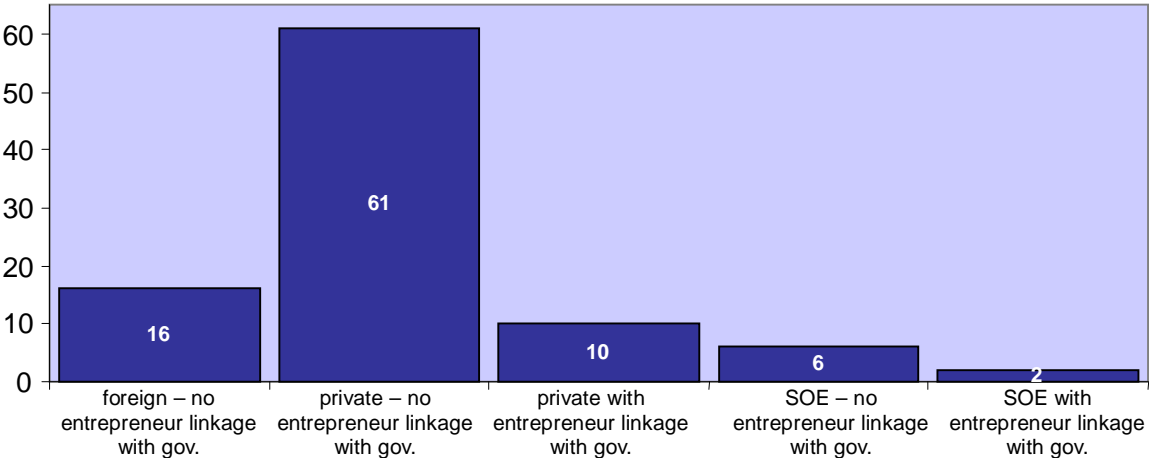
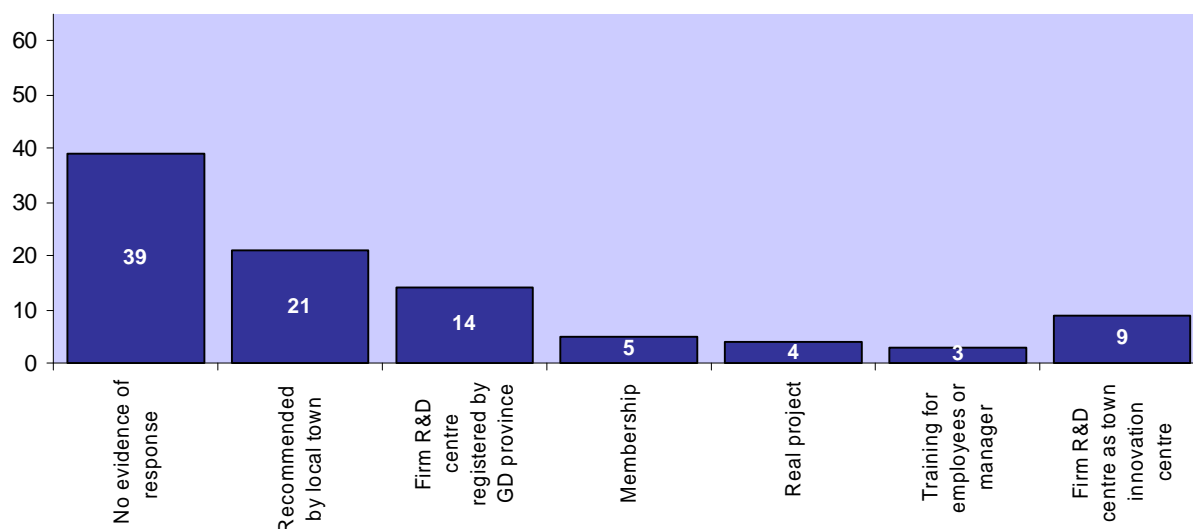


Figure 3. Frequency distribution of Firms' Response to Government Innovation Policy



As a first step of analysis we investigated the relationship between government control and firm's response by estimating the Kendall's tau-b correlation coefficient and the Spearman correlation coefficient. Both measures are used to verify the existence of a correlation between two ordinal variables, however the Kendall's coefficient is generally considered more reliable for small samples (Rumsey, 2003; Field, 2005; Fielding and Gilbert, 2006). We expect that a higher degree of response corresponds to a higher degree of control from the government.

The values of both coefficients are shown in table 4 and they suggest that the correlation between government control and firm's response is positive and statistically significant. That is, the two variables seem to move in the same direction, in line with our expectations. The absolute value of the correlation ranges from 0.296 of the Kendall's coefficient to 0.337 of the Spearman's. As we said, the former is probably a more accurate estimate since our sample is small. The value is not high but it is still relevant, meaning that almost 30% of the change in one of the two variables can be explained by a change in the other. Given that a firm's strategy in terms of innovation will be determined by a number of other factors beyond the government control, we find this first result very interesting.

Table 4 Correlation coefficients between government control and firm's response

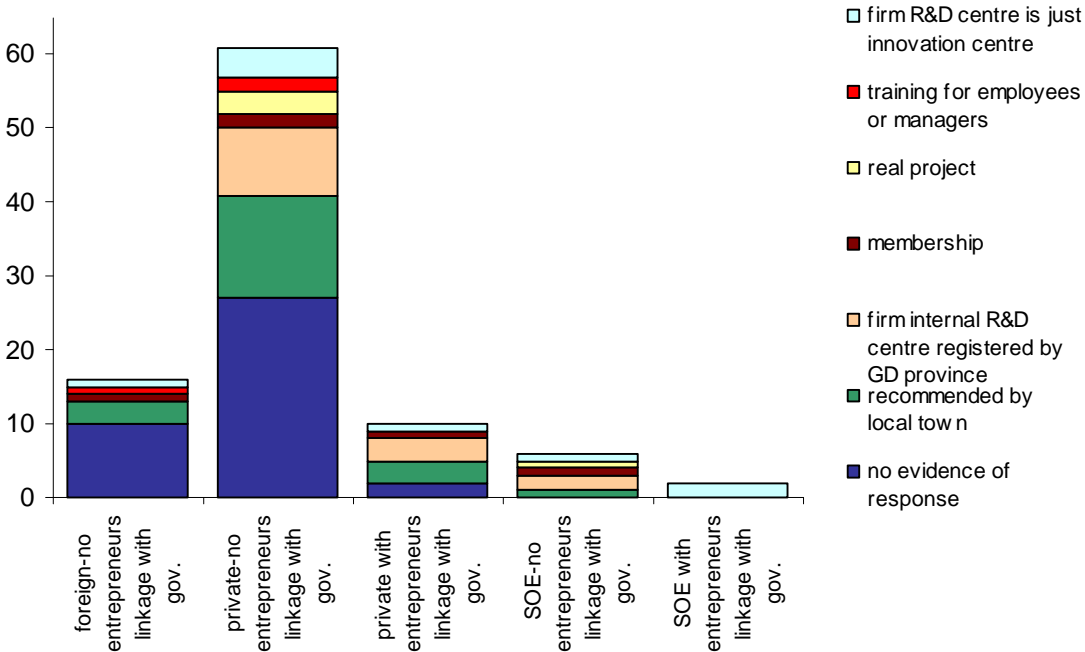
		Value	Significance
Ordinal by Ordinal	Kendall's tau-b	.296	0.001
	Spearman Correlation	.337	0.001

Source: authors' elaboration on SPSS

The correlation analysis itself does not allow to establish a direct causal relation between the two variables, but from a logic point of view it is reasonable to assume that it is government control that influences the firm's innovation strategy. Whereas we find it more difficult to argue that the choices of firms on their innovation strategies can change the

background of the entrepreneur or the ownership of the firm. We also show in figure 4 the cross-distribution of firms' responses and government control.

Figure 4. Cross-distribution of firms' responses and government control



As a second step, we added “government policy” as a control variable in the correlation between government control and firm’s response. In our view the three variables should go in the same direction, that is the highest response of firms to government policy should occur when the government control is highest and the policy intervention strongest. In other words, we expect that our control variable intensifies the correlation between government control and firm’s response in the case of strong policy and diminishes the correlation in the case of weak policy.

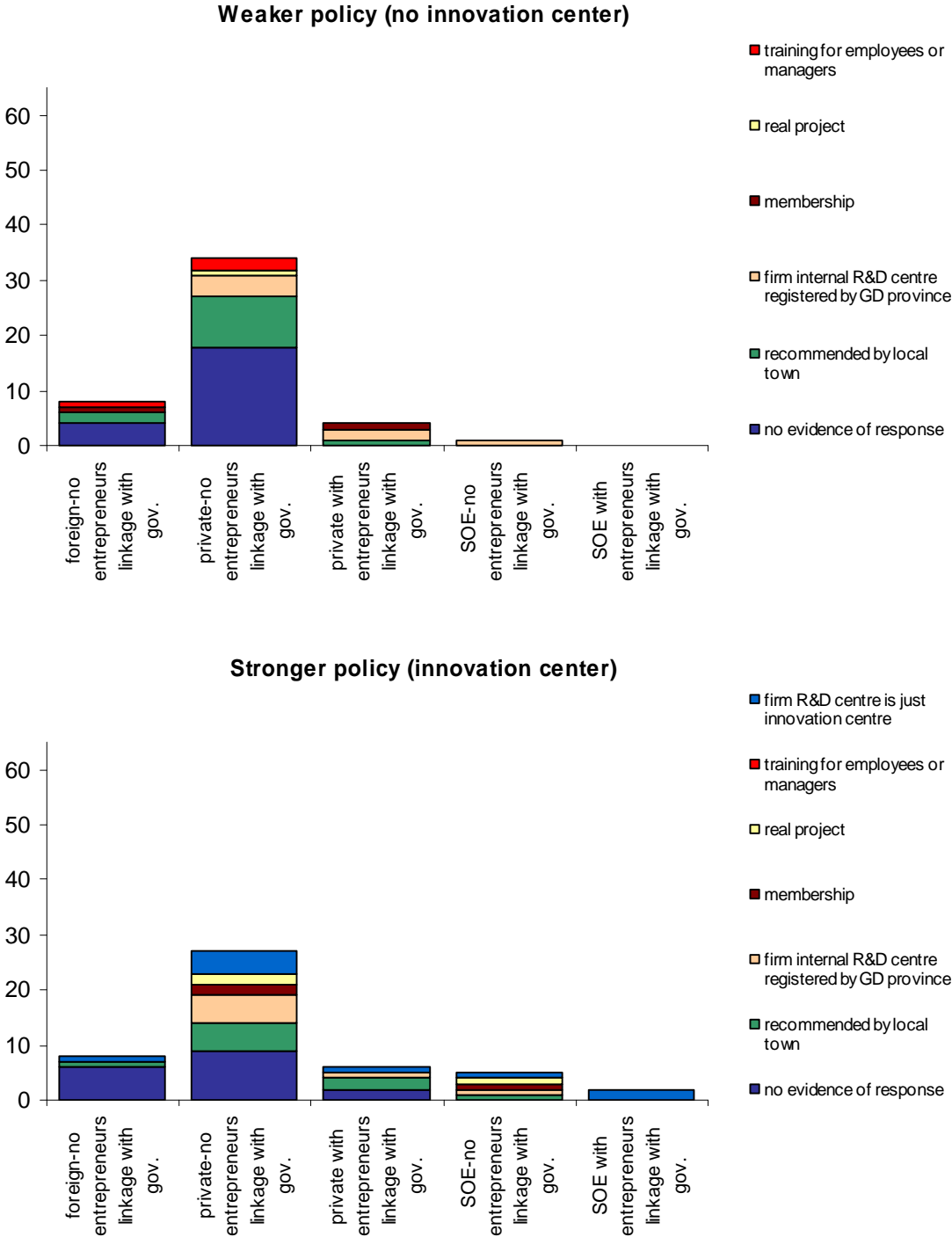
The results provided in Table 5 seem to go in this direction. We also show in figure 5 the cross-distributions of the variables in the two cases of weak and strong policy.

Table 5 Correlation coefficient between government control and firm’s response with control variable

Control variable			Value	Approx. Sig.
Weak Policy (No innovation centre)	Ordinal by Ordinal	Kendall's tau-b	.184	.186
		Spearman Correlation	.201	.175
Strong Policy (Innovation centre)	Ordinal by Ordinal	Kendall's tau-b	.339	.004
		Spearman Correlation	.393	.006

Source: authors' elaboration on SPSS

Figure 5 cross-distributions of firms' responses and government control, controlled by government policy



When the policy is relatively stronger, the correlation between government control and firm response is again positive and statistically significant (at 5% significance level); furthermore, it is higher in absolute value than in the previous test (table 4). On the other hand, when the policy is weaker, the correlation between government control and firm response is no longer significant ($p=0.186>0.1$). This is unexpected to some extent, but very interesting. It

seems to suggest, in fact, that it is the strength of the policy intervention that determines the final outcome and that, at least for this sample, a strong policy intervention is a necessary condition for a positive firm response, given the capacity of governments to influence the firm's strategic choices in innovation.

6. Final Remarks

In this last page we briefly recap the steps made in the previous paragraphs, and the results of the case study and we also suggest some more general implications that will guide our research agenda in the future.

First of all, we offered evidence on the government policy in favor of innovation in Guangdong Specialized Towns. The analysis clearly shows that in Southern China Guangdong local governments have defined and implemented a massive program for innovation: adopting western categories we may say that industrial policy is clearly part of the experience of development of this area.

However, we did offer evidence only on the existence of the policy but not on the capacity of the policy to reach its target: promote the innovation of Guangdong firms. Studying the literature, on this topic very few are the academic studies and non-Chinese scholars are not involved in this debate; moreover, the attempt of self-evaluation of government institutions appears too weak (or at least not accessible). In other words, no evidence is offered to check the real response of firms to the government policy a part from the one the government itself diffuses.

In this context, we decided to promote a case study focusing on the relation between government innovation policy and the subsequent reaction of firms. To this aim, we limited the object of our analysis to leading firms strategies and government innovation policies in Guangdong Specialized Towns.

The results of this case study support the view that there is a significant relation between the action of the government and the reaction of the firms. In particular, firms' strategic choices seem to follow government policy when three conditions are satisfied: the state controls the ownership of the firm, the entrepreneur has an evident linkage (background and present position) with government and the policy intervention favoring innovation is strong and concrete (i.e. innovation centre).

Although we are conscious that this is a preliminary study that needs further refining, even to better understand what is happening in Guangdong in the field of innovation promotion, we also believe that some results of our analysis should be found beyond the specific case study.

We refer in particular to more general questions that are still open in the international debate on the forces that guide industrial development in China

How quick has been the change of government role in contemporary Chinese industrial development? How different and how similar are Chinese practices to the ones of some western industrialized countries? More ambitiously, to what extent the transition of Chinese economy is a process of convergence to western models of industrial development?

From this perspective and coming back to the specific case study we offered, the following hypothesis need to be explored:

a) government policy exists and has an impact on firms' behavior, local development and innovation.

If this is the case, Chinese successful industrial development has lessons for other countries, which globally compete in the same international arena. Moreover, the Chinese government should invest more in policy evaluation practices able to offer quantitative and qualitative data to further legitimize and support its effective intervention.

b) government policy exists but has no impact because it is only an attempt of bureaucracies to find new legitimization in a context of transition from plan to markets.

If this is the case, Chinese authorities should question the role of government intervention in their new scenario; this could mean adopting models of industrial development where the policy intervention is minimized or some foreign best practices where policy still has a role beyond the dichotomy between plan and markets, studying effective remedies to what the international literature would define as cases of *government failures*.

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