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TERRITORIAL UNBALANCES IN THE CHINESE INDUSTRIALIZATION PROCESS

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Abstract

The debate on industrial development policies has in recent years moved to "how" governments should intervene and what goals to pursue, rather than "if" they should be pursued. Government intervention is often driven by goals that fall into three broad categories: solving market failures, promoting strategic objectives, and reaching meta-economic objectives such as access to knowledge, education, and health care an equal distribution of wealth, sustainable social and environmental development.

Chinese territory is studied as an example of industrialization and economic growth promoted through meticulous planning and targeted industrial policies justified by strategic goals. However, over time, critical issues related to the spatial distribution of the industrialization have emerged, thus threatening the sustainability of economic growth.

The aim of this work is to analyze the distribution of economic performances in China, at several administrative levels. The analysis is carried out using statistical permutation tests. Starting from the national level, territorial unbalances were analyzed in terms of economic performance in the period 1998-2010. Economic performance is measured using a composite index that includes five variables (GDP per capita, employment, density of enterprises, exports, and industrial output). In the second phase, the study proceeds with the territorial analysis in Guangdong province, emblematic case of the Chinese industrialization, using data at county-district level. At this stage territorial unbalances are analyzed not only with respect to economic performances, but also with respect to the intensity of policy interventions (the variables used are specialized towns, development zones, innovation centers, ratio of revenues over expenditure of the local government, and investments in innovation). Finally, the last part of the work is focused on the case of Dongguan, a prefecture located in the heart of Guangdong's industrial area. Here,

territorial analysis is carried out at the town level and with respect to economic performance.

The analysis returns the picture of a country marked by strong regional unbalances. Guangdong, which is one of the most industrialized provinces of China, shows a marked dualism between core and periphery, and unbalances among different areas not only in terms of performances but also in terms of intensity of policies. Nevertheless, Dongguan does not show unbalances in terms of performances and seems, on the contrary, uniformly industrialized.

在最近几年，对有关产业发展政策的争论，从"如果"政策干预，转移到更注重"如何"政策干预，以及随后所期望的目标。政府的干预往往是由三大宏观经济目标所驱动：找到弥补市场失灵的方法；促进战略目标；实现经济荟萃（"经济元"，多方位经济，不只是单单传统意义的经济），包括获得知识，教育和医疗保健，财富的公平分配，从而达到社会发展和环境可持续性的经济目标。

中国的情况是特别值得关注的，因为在过去三十年中就已经出现，是被认可的经济持续高速增长的国家。这种增长一直伴随着大规模的政府干预，有针对性的战略目标实施，如特定工业区的开放发展，促进民族工业和战略性行业，如高科技的支持。中国政策的分析强调市场失灵似乎并没有被列入首要目标，而元经济目标已经列入政策议程，特别是自上个五年计划，在区域不平衡地区更加明显。

中国的经济区域的划分被研究为工业化和经济的增长是经过精心的策划和准确的战略目标以及合理有针对性的产业政策实施一个例子。然而，随着时间的推移，关系到工业化的空间分布的关键问题已经出现，从而威胁经济增长的可持续性。

我们建议做的这项工作是分析中国经济表现的分布，更多的是注重管理水平。

该分析是通过统计学使用置换的方式。从国家层面出发，地域经济不平衡的经济表现是在1998-2010期间。经济表现是通过使用一个综合指标测定，其中包括五个变量（人均 GDP ，就业人数，企业密度，出口，和工业生产）。更深入的一步，我们着手在中国的工业化的代表性区域--广东省进行分析，充分利用城镇乡各层面的数据。在这个阶段，区域经济不平衡分析，不仅从经济表现的角度来看，也从对于政策干预强度大小的角度（使用的变量是专业的城市，开发区，创新中心，开支和收入之间的关系创新地方政府的投资）。最后，争论的最后一个环节专注于东莞——位于广东省心脏地段的发达行政大区。区域经济的分析最主要还是在城市一级，主要体现经济表现的差异。

最终的结论是，尤为突出的体现是区域经济的不平衡区域能力的落差大，在中国，广东省作为工业化程度最高最集中的省份之一，体现出了中心与边缘之间有明显的双重性市场，不仅在经济表现方面，而且在政策强度方面。然而，东莞并没有呈现经济表现的不平衡，与此相反，反应出统一均匀工业化表现。

Il dibattito sulle politiche di sviluppo legate all'industria si è negli ultimi anni spostato sul "come" intervenire e quali obiettivi perseguire, piuttosto che sul "se" intervenire. L'intervento di governo è spesso guidato da obiettivi riconducibili a tre macro-categorie: porre rimedio ai fallimenti di mercato; promuovere obiettivi economici strategici; raggiungere obiettivi meta-economici tra cui l'accesso alla conoscenza, all'istruzione e all'assistenza sanitaria, un'equa distribuzione della ricchezza, e uno sviluppo sociale e ambientale sostenibile.

Il caso della Cina è di particolare interesse poiché è un paese che negli ultimi tre decenni si è distinto per l'enorme e continua crescita economica. Tale crescita è stata accompagnata da un massiccio intervento di governo mirato ad obiettivi strategici come l'apertura e lo sviluppo industriale di specifici territori, la promozione dell'industria nazionale e il sostegno di settori strategici come quello

high-tech. Il territorio cinese è quindi studiato come esempio di industrializzazione e crescita economica promossa attraverso un'attenta pianificazione e politiche industriali mirate giustificate da ragioni strategiche. Nel tempo però, sono emerse criticità legate alla distribuzione sul territorio di tale industrializzazione che minacciano la sostenibilità della crescita economica.

Ciò che ci si propone di fare in questo lavoro è analizzare la distribuzione delle performance economiche in Cina a più livelli amministrativi. L'analisi viene svolta attraverso l'utilizzo di test statistici di permutazione. Partendo dal livello nazionale è stato analizzato l'equilibrio territoriale in termini di performance economiche nel periodo 1998-2010. Le performance economiche sono state misurate attraverso l'utilizzo di un indice di sintesi che include cinque variabili (PIL pro capite, numero di occupati, densità delle imprese, esportazioni, e output industriale). In una seconda fase, si è proceduto all'analisi territoriale in Guangdong, provincia simbolo della forte industrializzazione cinese, utilizzando dati a livello di contea-distretto. In questa fase gli squilibri territoriali vengono analizzati non solo dalla punto di vista delle performance economiche, ma anche rispetto all'intensità degli interventi di policy (le variabili utilizzate includono il numero di città specializzate, development zones, centri d'innovazione, rapporto tra spese ed entrate del governo locale, e investimenti in innovazione). Infine, l'ultima parte del lavoro è dedicata al caso di Dongguan, una prefettura situata nel cuore dell'industria del Guangdong. L'analisi territoriale viene condotta al livello di città e rispetto alle performance economiche.

Dal analisi svolta, emerge il quadro di un territorio segnato da forti squilibri territoriali, in cui anche una delle province più industrializzate della Cina, il Guangdong, presenta un marcato dualismo centro-periferia, non solo in termini di performance ma anche in termini di intensità delle politiche. Dongguan invece non presenta squilibri di performance e sembra, al contrario, uniformemente industrializzata.

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LIST OF ABBREVIATIONS

ADS	Above Designated Size
ASEAN	Association of South East Asian Nations
CRS	Contract Responsibility System
DBS	Dongguan Bureau of Statistics
DST	Department of Science and Technology
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
GBS	Guangdong Bureau of Statistics
GDP	Gross Domestic Product
IMF	International Monetary Fund
ISI	Import Substituting Industrialization
NBS	National Bureau of Statistics
OECD	Organization for Economic Cooperation and Development
PHR	Ports, Highways, and Railways
PRC	People's Republic of China
PRD	Pearl River Delta
SEZ	Special Economic Zone
SOE	State Owned Enterprise
ST	Specialized Town
TVE	Township and Village Enterprise
UNDP	United Nations Development Programme
WTO	World Trade Organization

INTRODUCTION

The debate on industrial development policies has in recent years moved to "how" governments should intervene and what goals to pursue rather than "if" they should be pursued (Rodrik, 2008). Government intervention is often driven by goals that fall into three broad categories: solving market failures, promoting strategic objectives, and reaching meta-economic objectives. The latter include social goods such as access to knowledge, education, and health care, an equal distribution of wealth, and sustainable social and environmental development (Chang, 1994, 2002; Amsden, 1989, 1994, 2001; Stiglitz, 2001; Di Tommaso & Schweitzer, 2005; Di Tommaso, 2006; Bellandi & Di Tommaso, 2006).

The theoretical framework shows that these objectives and the role of the state in development policies have always been controversial topics that have long been discussed since Adam Smith's Theory of Moral Sentiments (1759).

The case of China is particularly interesting because over the last three decades it has shown an intense and continuous economic growth. Chinese growth has been accompanied by a rich government intervention aimed at strategic objectives such as the opening and development of specific industrial regions, the promotion of national industry, and the support of strategic sectors such as high-tech industry. The analysis of Chinese policies, however, indicates that market failures do not seem to be included among the priority objectives. On the other hand meta-economic objectives have been recently included in the policy agenda, especially since the last few five-year plans when regional unbalances have become more evident.

Chinese territory is studied as an example of industrialization and economic growth promoted through meticulous planning and targeted industrial policies justified by strategic goals. However, over time, China has experienced critical problems

related to the spatial distribution of industrialization. Industrialization and development seem to be unequally distributed over the territory. This issue is threatening the sustainability of economic growth and for this reason policies have been recently oriented towards the correction of these unbalances.

The aim of this work is to analyze inequalities in China in the distribution of economic performances and show that intense and massive state intervention has failed in the purpose of distributing development and growth equally over the whole Chinese territory. The objective is to show that the territory is marked by deep territorial unbalances in terms of economic performances and that it is growing at different speeds.

The analysis is performed at several administrative levels and is carried out using statistical permutation tests. Starting from the national level, territorial unbalances are analyzed in terms of economic performances in the period 1998-2010. Economic performance is measured using a composite index that includes five variables (namely GDP per capita, employment, density of enterprises, exports, and industrial output).

In the second phase, this study proceeds with the territorial analysis in Guangdong province, an emblematic case of the intense Chinese industrialization. This province has been growing for more than three decades at two-digit percentage growth rates. Furthermore, it is an area in which planning and state intervention have been particularly intense. Opening-up policies, sectorial specialization policies, and innovation policies, among others, were tested in this region before being applied over the whole national territory.

The aim in this phase is to assess if growth and industrialization have been spread uniformly over the territory. Additionally, the distribution of state intervention in the last decade is analyzed. The objective in this case is to verify in which areas the government is concentrating its policy efforts.

The analysis here is carried out using data at county-district level. At this stage the territorial unbalances are analyzed not only with respect to economic performances, but also with respect to the intensity of policy interventions. Thus, the variables

used are specialized towns, development zones, innovation centers, ratio of revenues over expenditure of the local government, and investments in innovation. Performances are measured for 2008, while the intensity of policy intervention is measured for the periods 2003-2005 and 2006-2008.

Finally, the last part of the work is dedicated to the case of Dongguan, a prefecture located in the heart of Guangdong's industrial area. The aim here is to assess territorial unbalances in one of the most industrialized areas of Guangdong as well as the whole of China. Territorial analysis is carried out at the town level and with respect to economic performance in 2008.

The work is structured in the following way. Chapter 1 is dedicated to the theoretical framework on the role of the state in development. Next, the review presents a description of the debate on the reasons why the state intervenes in the economy. Then, an overview of the historical thought focusing the attention on the reasons and objectives that drive governments towards intervention, is presented. Finally, the analysis concludes with the current debate on the use of policies to foster development and growth.

Chapter 2 introduces the main character of this research - China. In this part of the work an overview of the main pillars of Chinese economic development is presented, making a comparison with the traditional models of development presented in chapter 1. Finally, the current situation of China is described, focusing attention on inequalities.

Chapter 3 examines the assessment of territorial unbalances from a performance perspective. This chapter is fully dedicated to the description of the objectives, methodology and the results of the analysis.

The work proceeds with Guangdong province in chapter 4. Here the economy of Guangdong is described, focusing on the last decades of growth and development. The main policies and programmes that have favored the rise of Guangdong, not only in the national context, but also internationally are here illustrated. Finally, the chapter concludes with the introduction of the current concerns of inequalities that undermine Guangdong's socially sustainable growth.

Chapter 5 is dedicated to the assessment of territorial unbalances in Guangdong in terms of performances. As for the case of China, the chapter is dedicated to the description of objectives, methodology, and results of the analysis.

Chapters 6 and 7 conclude the analysis on territorial unbalances in China. Chapter 6 describes the image of Dongguan in terms of industrialization, development, and growth, trying to underline its importance in Guangdong's process of industrialization.

Finally, chapter 7 focuses on the study of territorial unbalance in terms of performances in Dongguan at the town level. Here, as in chapters 3 and 5, the description of objectives, methodology, and results of the analysis are presented.

PART I
Theoretical debate on development and features of the Chinese model

1 STATE INTERVENTION AND DEVELOPMENT

1.1 REASONS FOR INTERVENTION

The debate of industrial policies, of whether or not governments should intervene in the economy through policies is still ongoing and it has lasted for at least three decades. Nonetheless, the aim of this paragraph is not to mark the end of this debate, but rather to clarify what are the main motives that bring governments to use policies.

In this section, an overview of the main reasons for intervention will be given from a theoretical perspective. In the literature, there are two main approaches. One is focused on market failures that generate inefficiencies. In these cases, the intervention of the government is justified by the fact that a set of services and mechanisms need to work. The other approach suggests that the government should intervene for other reasons despite the fact that the market fails.

Before going into details, it is useful to specify the meaning of market failure and in which situations they are experienced. Market failures are the result of situations in which the market is unable to balance costs and benefits between the society and a private entity. Three main reasons for market failures have been identified in the literature: externalities, public goods, and non-competitive markets.

Externalities are found in cases in which anyone's activity produces positive or negative effects on someone else's activity. Positive externalities usually are not rewarded and negative externalities do not contemplate the payment of a fee. Market failures happen because negative externalities might generate an overproduction, while positive externalities might generate an underproduction. This is particularly important because enterprises may be discouraged from starting new activities that could be desirable for the society. Since enterprises aim at maximizing their profits, they could decide not to carry out their activities when the

positive externality is not adequately remunerated by the beneficiary entity. In short, positive externalities that are not adequately remunerated may cause the entrepreneur to stop its activity. On the other hand, negative externalities not involving payment of any fee by the entrepreneur, can act as an incentive to remain in operation despite the negative effect suffered by other parties. To better understand these concepts consider the case of positive externalities when there may be companies that decide to undertake research and development. These companies could be discouraged by the fact that other entities take advantage of their research activities without the payment of any fee. In the case of a negative externality, a classic example is companies that discharge pollution: in the absence of a fee for the production of pollution, they will continue their activities.

In these cases, the government intervenes trying to ensure that the positive and negative externalities are produced reaching a social optimum. For this reason, governments promote actions that involve the use of policy instruments (such as incentives, subsidies, taxes, fines, etc.) aimed at supporting those who produce positive externalities and to discourage the production of negative externalities.

Another situation in which the government intervenes is in the supply of public goods, those goods that are non-rival and non-excludable. In other words, goods consumed by one person that does not preclude the chance to enjoy the same goods by another person at no additional cost. In addition, with public goods it is not possible to exclude those who do not pay for the use of the asset. Accordingly, it is reasonable to assume that if a product is available at no charge, individuals who wish to use it will be discouraged from stating the amount of money they are willing to pay for it. In this context, it is easy to encounter free-rider behaviors that will cause the market not to reach the socially optimal level of the public good in question. These types of goods includes the production of services in the field of health, education, justice, and culture. In these areas, the public sector intervenes offering a sufficient amount of the good or encouraging the private sector to produce it. Industrial policy is therefore called upon to intervene by ensuring that the goods are produced in a desirable amount.

Finally, in non-competitive markets, industrial policy intervenes to reach equilibria that the market would not otherwise be able to obtain. There are cases in which the existence of a monopoly is justified by efficiency. Sometimes natural monopolies are justified by some structural conditions that guarantee the efficiency of the market only if a single producer meets all the demand. There are also situations in which the natural monopoly is justified by the lack of a particular factor of production.

In other cases, the limited number of firms in the market is determined by a competitive interaction. This interaction can lead to non-competitive situations as firms adopt strategic behaviors that allow them to remain in the market to the detriment of other competitors, thus reducing the number of those who participate in competitive dynamics. This is the case of attempted monopolization: actions that reduce access to the market or cartels. In cases such as natural monopoly, the monopolist will tend to offer a lesser amount of the good at a price higher than in competition, thus causing a loss of social welfare. In such a case, the policy objective is to correct the market failure trying to deliver the good to a level of social optimum.

As mentioned before, there are also situations in which it is not the market failure that pushes the government to intervene (Bellandi & Di Tommaso, 2006). In particular, in some periods of economic history the governments of some countries have intervened following a different logic and pursuing either strategic economic goals (Chang, 1994, 2002; Stiglitz, 2001; Amsden, 1989, 1994, 2001) or objectives that fall in fields that differ from the mere economy (cultural, social, moral field) and that are defined as meta-economic objective (Di Tommaso & Schweitzer, 2005; Di Tommaso, 2006; Bellandi & Di Tommaso, 2006).

With regard to strategic economic objectives, there are cases in which the state intervenes using policies that support domestic industry or by promoting their birth in a particular area or sector. These policies have been used in the past by the first countries that have emerged in Europe in terms of development, such as France and England, followed by countries that emerged a few years later (Italy, more recently, China and other Asian countries). Industrial policy plays a role in those areas that

are believed to be weak and in which the aim is to strengthen national industrial development. Finally, as another case, industrial policy focuses on strategic objectives when a single firm becomes the subject of politics. In this case, firms in difficulty considered as strategic for national development and sometimes in competition with major foreign companies, receive aid from the government.

The objectives that go beyond the economic dimension, however, are the focus of industrial policies that aim at promoting access to goods considered essential, such as education, health, knowledge, or the redistribution of income between classes and/or generations. There are situations in which industrial policy action tries to curb territorial imbalances within a country. These imbalances are usually considered as harmful since they decelerate and limit the development capacity of a nation. Finally, industrial policy intervenes in order to assure the environmental and social sustainability of growth paths.

Industrial policy therefore aims at encouraging or discouraging the production of those goods considered essential (education, culture) or harmful for the society (alcohol, cigarettes, etc.), offering answers when specific goods' production should not be left to the interaction between supply and demand. In particular, this is the case of activities that society prefers to self-regulate in order to prevent them from being left to market dynamics. Industrial policy thus becomes a tool through which the territorial government promotes its model of society based on its own culture and morality.

It should be noted that sometimes the model of society we want to propose corresponds to a part of the community represented by policy makers who are in the government. Thus, an elected government that has the task of identifying the objectives and policy instruments represents the collective interest. It may happen, therefore, that the interest promoted by certain policies corresponds to that of a little part of the society and not to that of an entire community. This mechanism results in many cases in a failure of policy, which strengthens the interests of part of the society and weakens the position of the class that is not able to influence the policy decisions of the government.

In addition, government bodies are in turn composed of a plurality of subjects, as well as of multiple levels of government, which tend to reach the maximization of their own utility. The industrial policy intervention may sometimes pay in lack of efficiency and effectiveness (Di Tommaso, 2006).

However, over the years the opinion on, and contents of, industrial policies have undergone enormous changes. The next paragraphs will be dedicated to a brief overview of the historical evolution of economic thought on the use of industrial policies.

1.2 ORTHODOX ECONOMICS VS. KEYNESIAN SCHOOL

The debate on the intervention of government in the economy of a country has always been characterized by an alternation in the history of opinions for and against.

The way to promote economic growth has always been the focus of debate, since the time when Adam Smith published in 1776 *The Wealth of Nations*. He argued that the feudal laws could not restrict the initiative of the individual since a nation can only grow if the competition is free of constraints.

According to Smith, in fact, the market was a social institution, totally at odds with the principles and mechanisms that regulated feudalism, which was based on rigid hierarchies that governed trade mechanisms. The market is therefore understood by Smith as a connection of horizontal relationships whose only hierarchy is determined by the skill of the actors to organize productive activities and by the social position they occupy. Through these mechanisms, the individual asserts his rights in society. Smith argues that an economy based on the development of market forces needs a state strong enough to guarantee property rights and the presence of positive externalities such as health, justice, defense, education, etc.. For these reasons, Smith has always been opposed to all forms of protectionism and has

strongly promoted free trade (Bianchi, 1994). Monopoly, according to Smith, had to be avoided because it distorts the allocation of resources, thus returning a distribution of wealth that does not optimize the use of resources and created social inequalities (Bianchi & Labory, 2006).

In *The Theory of Moral Sentiments* he inquires on the ability of the individual acting as a external observer. Smith's famous metaphor of the "invisible hand" was initially seen as a divinely given miracle in the religious debate. Only in a second stage was it given another interpretation, as the hand that regulates the marketplace. In brief, Smith's insignts can be summarized by saying that the markets are self-correcting; they are not perfect, but they are superior to any other alternative; hence, there is no reason to think of the existence of market failure.

Smith's idea is that the outcome of a certain kind of behavior in a certain social framework returns certain definite and foreseeable results. The drive of individual self-interest in an environment of similarly motivated individuals will result in competition. In turn, competition will result in the provision of those goods that the society wants, in the quantities that the society desires, and at prices that the society is willing to pay.

Self interest acts as a driving power to guide men to whatever good society is willing to pay for. Self-interest drives men to action, but on the other hand there must be something that prevents the pushing of profit-driven individuals from charging society up exorbitant amounts of money. According to Smith, what regulates the conflicts of the self interested actors on the marketplace is competition. Hence, a selfish man who takes advantage of the neighbor's need, charging too much for his goods or refusing to pay a fair salary to workers, will soon find himself without buyers and employees. Thus, in Smith's idea, the selfish motives of men are transformed into social harmony.

The laws of the market, in Smith's thought, do more than impose a competitive price on products. The mechanism of the market makes society change the allocation of its factors of production in order to fit its new desires. In this way, no planning authority is involved in the process and cannot establish a schedule of production. Self-interest and competition, acting one against the other, are the

means through which the transition can be accomplished. Furthermore the market also regulates the incomes of those that produce goods. If profits in one business are exceedingly high, then there will be a crowd of producers that will start that business until competition lowers surpluses. Conversely, if profits are too low, this will generate an exodus of producers from that business.

Thus, according to Smith's view, the market is self-regulating and less government is certainly the best. Smith's theory is a docrtine of *laisezz-faire.* He specifies the things that the government should do in a society of natural liberty: protect the society against "the violence and invasion" of other societies; the government should provide "an exact administration of justice" for all citizens; the government has the responsibility of creating and supporting those public institutions that may be of advantage to a great part of the society. Thus, Smith's recognizes the usefulness of investments in projects that cannot be carried out by the private sector and that are extremely advantageous for society.

Smith is against the intrusiveness of government in the market, against contraints to imports and exports, and against laws that protect industry from competition. Nonetheless, it is necessary to point out that Smith is not against the government per se, but rather against any form of monopoly. According to his thought, any interference with the market, necessarily lowers the social welfare. The market forces, instead are able to generate the greatest number of goods at the lowest possible price.

Thus, the market must be left without impediments and free to find its own "natural" level of prices, outputs, wages, and profits. Anything that interfers between the market and society does nothing but diminishes the wealth of the nation.

In brief, Smith's idea of development is mainly focused on growth and structral transformation of the economy and society. He sees optimistically the progress brought by the expansion of the markets and increase in trade exchanges, which in turn would return a greater division of labor. Smith's theory supports the abolition of the old statutes and corporate institutions, and the elimination of feudal and protectionist practices. He is instead in favor of individual initiative and free market,

still giving the state a great importance in the creation of favorable conditions for development.

The history reveals the fact that countries that have implemented their own transformation from agrarian economies to advanced industrial economies have had considerable support from the government to help businesses overcome coordination problems and problems due to externalities (Lin & Monga , 2011).

The use of industrial policies, as has been widely described in the previous paragraph, is usually explained in two ways. On the one hand there is the approach that in some circumstances market mechanisms fail and the government is forced to correct these failures. On the other hand, there are contributions in the literature in which it is argued that in some cases government is called upon to intervene to pursue goals that are not dependent on "market failures" (Di Tommaso, 2006).

Since the industrial revolutions of the nineteenth century occurred in the currently industrialized countries, state intervention has played a key role in the application of catch up strategies from other economies already industrialized (Chang, 2003; Lin & Monga, 2011).

Until the Great Depression the idea of "trusting" the market had been in vogue. From that point, something changed in the economic thought, even though some economists still believed that if something happens in a market economy, it must be right (Krugman, 2009).

The egemony of neoclassic theories came to a stop when in 1936 John Maynard Keynes published the *General Theory*. The ideas of Keynes started to gain consensus. He was not in favor of a complete control of the government in the economy. He was rather in favor of the idea that market economies need some form of regulation and control in order to avoid speculation, especially in the financial markets or high unemployment rates during depressions.

Keynes accepts the idea that the market fails to provide basic social needs to the population, such as education, health care, etc. His ideas developed during the Great Depression. Thus, he believed that there was not any automatic safety mechanism to prevent the economy from falling into depression. Furthermore, not only could

the economy go up and down, but it could also stay down for an indefinite amount of time. Hence, a depression might not cure itself and might leave the economy in stagnation indefinitely. This was because, according to Keynes, once the economy goes into depression the incomes are contracted and savings are reduced. The result is not an excess in savings, but rather, a drop of savings.

One of the consequences of this decline in saving was that the economy found itself in a situation of paralysis and could not move out of that condition. The mechanism was that without a surplus of savings, there could not be a push on interest rates in order to encourage borrowings. Thus, without borrowings and investment spending, there would be no encouragement to get out of this condition. In this way the economy would remain in a condition of "equilibrium", even with massive unemployment.

For this reason, the government should intervene in order to solve these failures. Through the use of fiscal policies or monetary policies, according to Keynes, it is possible to address budget surpluses/deficits or adjust money supply and interest rates. These policy tools, thanks to the multiplier effect, have outcomes also on the lives of the population: i.e. increasing money supply can produce effects on the issuing of money loans favoring the development of businesses.

The role that Keynes assigns to macroeconomic policies and public intervention aimed at compensating the deficiencies of the market has strongly influenced policies during the period of the Golden Age, but also the policies of countries that in the first post-war decades proceeded to set development plans to reduce the gap that separated them from the developed countries or the backwardness of the regions within them.

Accordingly, Keynesianism is in some way more pessimistic than Smith's theories, mainly because of four features included in the theory (Hunt, 1989). First, the lasck of cinfidence in the ability of the private sector to achieve full utilisation of productive resources (Johnson, 1971). Second, in the theory, great emphasis is given to state intervention (Johnson, 1971; Lal, 1983). Thirdly, the role of investments is given a prominent role in the determination of aggregate demand and employment (Johnson & Johnson, 1978). Finally, part of Keynes' ideas focus on

macroeconomic policies aiming at the elimination of micro-economic efficiency issues (Lal, 1983).

1.3 MARXIAN DEVELOPMENT APPROACH AND IMPORT SUBSTITUTION STRATEGIES

The Marxian development approach matured during the western European development of the 18th century. Marx did not write about developing countries, which were almost entirely colonial at that time. His focus was the industrial revolution that took place in Western Europe and especially in England.

At the base of the Marxian thought is the idea of Great Transformation. According to Marx, during the process of development, industry replaces agriculture. Agriculture grows absolutely, but shrinks as a share of GDP. In this way, after a reasonable time, industry will dominate the economy.

In the peasant society as seen by Marx, peasants produce much of what they consume and consume much of what they produce. In this form of subsistence economy, market has a marginal role. Furthermore, peasants use simple tools, thus limiting the scale of production units.

Thus, in general, Marxian tradition is very critical of the feasibility of creating a development process in a peasant-dominated social environment.

As concerns its view of capitalism, according to Marx, the main characteristic that differentiate capitalism from previous forms of production is the capitalist's drive to accumulate wealth through productive investment. Under capitalism two classes with opposing interests emerge in economic activities. They are capitalists, the more powerful, and proletariats. Capitalists also dominate the state and use state's institutions to support their own interests. Furthermore, the capitalist that owns the means of production, uses its power to extract and appropriate surplus value from

the workers. The mechanisms composing this dynamic lead to the creation of the preconditions for the transition to socialism (Hunt, 1989).

Accumulation of wealth leads the capitalist to search constantly for means and technical innovations that will enable him to raise his profits and win over other competitors. In this way, less inefficient capitalists will be destroyed by competition. As individual capitals expand, workers become more and more extraneous from the labor process and the capitalist class.

Capitalist competition has an anarchic nature that leads to periodic crises caused by phases of overproduction or under consumption. In these periods of crisis, labor is dismissed and wages decrease. Finally, another crisis will occur when uncoordinated development of the productive forces approaches exhaustion. In this phase, the working class will appropriate the tools of production and initiate the transition towards a new egalitarian method of production (Hunt, 1989).

That is to say that in Marx's view, capitalists have a great role in society and production, while the role of the state is not predominant. Furthermore, change to new forms of production happens spontaneously following innovation, crises and transition.

Despite in Marx's work an organic treatment on the role of institutions is missing, it may be noted that, according to Marx, the institutions regulate social relations of production. He expresses the importance of institutions in determining the characteristics and the mutation of the economic system, particularly in reference to the effects of lease contracts in the long term, in reference to English law on common land, in reference to agriculture and the supply of work for the infant industries in eighteenth century. Particular emphasis is given to the English laws on factories in nineteenth century.

Marx, like Smith, assigns great importance to the role of international trade and considers the world market as one of the levers essential for the formation and development of the capitalist economy.

Marx sees the world market as one of the fundamental characteristics of capitalism and attributes great importance, particularly in relation to the birth of phenomena

such as the slave trade and colonialism. As Smith, Marx also is familiar with the conditions of impoverishment imposed by European countries to submissive peoples, but sees colonialism as a factor of progress for these countries as it would have the ability to destroy their archaic economic and social structures, thus allowing development of the productive forces.

Though Marx was not an economist, his studies on industrialization in England had a great impact on the first generation of development economists like Gerschenkron. In his articles, Gerschenkron stresses the potential advantages of economic backwardness.

Latecomers might be induced to jump some phases in order to catch up with the West. Their development is hence very different from that of the advanced economies. There may be differences in terms of the speed and character of the industrial development. This means that the latecomer has more difficulties to catch up with the advanced country. Furthermore the latecomer has to make changes in the institutional framework: i.e. sound banking institutions might make the difference in the process of development. The latecomer, in fact, lacks adequate supplies of capital. It also lacks skilled labor, entrepreneurship, and market institutions.

Gerschenkron's (1962) contribution establishes a relationship between the development of the latecomer and that of the advanced country. The economic backwardness of a country, seen relative to that of the advanced economy, may show different opportunities and potentials. It depends on the degree of backwardness of the country. In brief, the more backward the latecomer is, the greater the tightness between the actual state of economic activities and the great potential intrinsic in industrial development (Chu, 2010). In other words, the larger the degree of economic backwardness, the greater the jump to catch up needs to be, the more imbalanced the development process will be.

In this framework, the development economics thought of Import-Substituting Industrialization (ISI) emerged. In order to strengthen development and achieve a planned transfer of economic resources from agricultural to industrial sector, it developed the idea of creating industries for goods that had been imported until that

moment. This type of industrial policy aimed at substituting imports with national products through customs protection. In this way, national industry is fostered and develops.

These policies were used particularly during the 1950s in the underdeveloped countries, but only after few years they started to show signs of ineffectiveness. Some of the problems were due to the fact that for an underdeveloped country, the market of each industrial product is very small and limited. Thus, with new technologies that have high fixed costs, the number of enterprises that can enter the market is very little.

Furthermore, these situations imply the creation of monopolies or oligopolies, which might be dangerous for the economy.

In the ISI, two stages have been recognized. "Easy" or "first" stage consists of industries for basic consumption goods such as beverages, textiles, shoes, cigarettes, wearing apparel, etc. The "second" stage puts more emphasis on production and transportation of products such as bicycles, trailer, motors, pumps, etc.

ISI was thought to bring rapid industrialization, to produce financial savings on imports, to acculturate a peasant population in rhythms of industrial society, to increase demand complementarities across industries, and create a backward stimulus to agriculture.

The ISI strategy brought some consequences both at the political, economic and social levels: corruption, exile of intellectuals, expansion of bureaucracy, decline of public services, decline of the agricultural sector, failure of industries, shortages and scarcities of goods, decline of the banking sector, domestic and international indebtedness, low or negative growth rates, widening of the gap with industrialized countries, dependence on western aid, growing internal inequalities, and declining levels of health and education.

Some explanations were brought by different political wings. The "Left" explanation gave the responsibility of the failure to a number of factors such as the existence of core-periphery dynamics, corruption of national leaders, high costs of capital goods.

The "center" explanation claimed that the ISI strategy failure was due to the poor implementation of its dictates. The theory of ISI greatly differed from the practice.

Finally, the ISI strategy was criticized by the "Orthodox" economists whose idea was that free trade could have brought better results since markets work better than governments' regulations.

1.4 WASHINGTON CONSENSUS, ITS FAILURE AND POST WASHINGTON CONSENSUS

Contrary to what is thought conventionally, the industrial success of Western economies cannot be totally attributed to free market policies. The structural transformation of these countries is the result of the combination of industrial, commercial, and technological conditions that included the use of import tariffs, embargos on imports for the protection of infant-industries, promotion of industry through government-granted monopoly, state investments, subsidies, and public-private investments.

This happened especially in the USA and Britain, but also European countries have, at some point in their history, attempted to reach Britain through policies aimed at technological upgrading. France, for example, during the first industrial revolution attempted to facilitate the movement of skilled workers to the most technologically advanced countries in order to acquire new skills. The British government on the other hand, however, forbade the entry of skilled workers from other countries for over a century. However, when new technologies were an integral part of the machinery, the government put under control the export of "tools and utilities". In other occasions, the acquisition of new technologies was supported by governments through both legal and illegal means (Lin & Monga, 2011).

State intervention has therefore always assumed various forms. In the early stages of the industrialization process, for example, Japan created many factories in various sectors (textiles, shipbuilding, mining, etc.). Many of them were soon after

sold at low prices and/or with additional subsidies, thus starting the process of industrialization and diversification of production. In this way, when public industries had poor performance, they were sold to private individuals and became successful because of the integration between management capabilities acquired by the state-owned firm and the process innovations that reduced the cost of labor (Otsuka, Ranis, & Saxonhouse, 1988).

In the U.S., the government has always consistently offered strong incentives to private industry and academic institutions in order to do research and bring new ideas to sustain growth in the field of defense, energy, and healthcare. Although in the U.S. it has been discussed for decades about the need, or not, to use industrial policies, the reality is that the central government and federal governments have had a very important role in the industrial development of the United States.

Even in Europe the discussion focuses on the need, or not, of industrial policies since the end of World War II. Many times in Europe it has been necessary to adopt collaborations between governments supported by the European Union to achieve business objectives (Lin & Monga, 2011).

France has recently promoted development programs in which the public sector and the private sector coordinate to develop new technologies and thus new industries. The French government also has a long history of financial support to the private sector through subsidies, tax credits, and developmental government-run banks.

Britain has instead strengthened in recent years, the government's support for business activities, in particular, for new businesses, improving access to credit; has strengthened the creation of knowledge and supported the learning of new skills and capabilities.

For several decades, it was considered that planning was the appropriate instrument to coordinate or replace the investment decisions of entrepreneurs and that the fixing of prices, subsidies and protectionist barriers could foster industrialization and growth. The space left to the state and the market, the rigidity and pressure of economic plans, and the level of protectionism varied from country to country. As a result, confidence in the market to ensure increased production and business

efficiency, or effectiveness of programs of liberalization promoted by structural adjustment programs have met some criticism (Mynt, 1964; Hirschman, 1968; Bauer, 1972; Volpi, 2003).

According to Zhang & Zhaoyang (2007) the poor performance of Latin America in the 50s and 60s ca be justified with the failure of the traditional theory of industrial policy. In addition, the rapid growth of East Asian economies forced the creation of the new theory of interventionism that was expressed in the "strategic trade policy", and provided to developing countries the base for the formulation of industrial policies and the implementation of interventions in the economy.

Since the eighties the Anglo-Saxon literature has reduced the role of the State and, in particular, the use of industrial policies in the markets (Bianchi & Labory, 2006), claiming that in an open environment it is necessary to allow that development occurs through the free functioning of the market. At that time, the term "industrial policy" was used to refer to actions restricting or replacing the market.

During the Eighties, the economies of the world were divided between market economies and planned economies where industry was governed by public interventions. During the era of Thatcher and Regan, reforms where based on privatization and liberalizations and Europe had just started its process of enlargement. At this point Asia was just starting its miracle and China, in particular, was about to start its reform process experiencing new economic strategies such as the "Open Door Policy".

In 1989, Williamson coined the term Washington Consensus identifing a set of 10 economic policies that at that time were advised to developing countries by the Washington-based institutions such as International Monetary Fund, World Bank and U.S. Treasury Department.

The consensus, as originally drafted by Williamson, included 10 large groups of relatively specific advices on economic matters:

- A fiscal policy discipline aimed at avoiding strong fiscal deficits relative to gross domestic product;

- The readjustment of public spending towards targeted interventions: the reccommendation was to limit the "indiscriminate subsidies" and instead promote measures to support growth and weaker sectors, such as fees for basic education, health and basic infrastructure development;
- Reform of the tax system, broadening the tax base (the total sum of individual tax bases) and the lowering of the marginal tax rates;
- Interest rates determined by the market and moderately positive in real terms;
- Exchange rates of the local currency determined by the market;
- Liberalisation of trade and imports, and in particular, the abolition of quantitative restrictions and perpetuation of duties at a lower level;
- Opening and liberalization of inward foreign investments;
- Privatization of state-owned companies;
- Deregulation: abolition of regulations that impede market entry or restrict competition, except as regards the conditions of safety, environmental protection and consumer protection and a reasonable control of financial institutions;
- Protection of private property rights

This formulation was created on an attempt to summarize main economic policies, with particular reference to policy reform in Latin America.

This new approach to policies for industrial development increasingly influenced the actions of international institutions, national and regional governments. Soon, the original Washington Consensus took the form of a liberal line of policy centered on opening of economies, the privatization of state-owned enterprises and the deregulation of economic activities (Stiglitz, 2002). It is in fact often identified as a shift from state-led to market-oriented policies (Gore, 2000).

This approach did not worked as expected, since it did not lead immediately to growth and development (Bianchi & Labory, 2006). Even the most enthusiastic supporters of the Washington Consensus now agrees that growth has been below expectations in Latin America (Rodrik, 2006).

With the fall of the Berlin Wall and the collapse of the Soviet Union, former socialist countries similarly made an audacious step toward markets. In Sub-

Saharan Africa, governments moved with less confidence and speed, but there too most of the new policy agenda was adopted: state marketing boards were dismantled, inflation reduced, trade opened up, and significant amounts of privatization undertaken (Rodrik, 2006). Thus, what emerged in 1990s after an extensive period of reforms was that (Rodrik, 2006): (1), there was an unexpectedly deep and continued decline in output in countries making the transition from communism to market economies; (2) Sub-Saharan Africa failed to take off, despite significant policy reform, improvements in the political settings, and sustained foreign aid. Only few countries were successfully; (3) frequent and severe financial crises undermined stability od countries in Latin America, East Asia, Russia, and Turkey; (4)the Latin American recovery in the first half of the 1990s proved transitory; (5) Argentina fell into a deep crisis in 2002.

Nonetheless, the period since 1990 was not a disaster for economic development. By the contrary, in terms of of global poverty, that period proved incredibly favorable. Rapid economic growth in China, India, and a few other Asian countries resulted in an absolute reduction in the number of people living in extreme poverty. The paradox is that China and India increased their confidence on market forces, even though their policies were extremely unconventional. High levels of trade protection, lack of privatization, extensive industrial policies, and lax fiscal and financial policies through the 1990s determined the economic growth of these two economies. Thus, they were far from being considered as of the Washington Consensus (Rodrik, 2006).

Thus, in post-Washington Consensus era, the importance of the government in shaping policies bacame crucial. According to Stiglitz (1999) the government has to be a complement to markets. Implying with this sentence that the government should undertake those actions and activities that make markets fulfill their functions better. In some cases, the government have proved to be an effective promoter of growth, by supplying innovation or social needs. But, once it has completed its function, Stiglitz (1999) sustains that it needs to withdraw.

Furthermore, the post-Washington Consensus signed the enlargement of needs and goals. Increases in GDP were not sufficient anymore. Rather, increases in living

standards, including in access to education and health, were intensively pursued. The range of needs enlarged including also the pursuit of sustainable development, including the preservation of natural resources and mantainance of healthy environment; equitable development, thus ensuring that all individuals in society benefit from development; democratic development, in which citizens participate making decisions that affect their lives (Stiglitz, 1999).

Historiacally then, industrial policies have been widely used. Interventions were mostly used for the protection of intellectual property, support for basic research or for public procurement. At the local level, the settlements of industries in specific geographic areas were instead encouraged in order to boost new investments. In other cases, industrial policy has been banned for decades by the international debate because it was believed that, in open market conditions, industry and the economy in general should operate freely. Nevertheless, in the last three decades the words "industrial policy" are back in vogue and some, albeit few, governments have started to promote it. Most governments carry out various forms of industrial policy, even if they call it by other names (i.e. export facilitation, promotion of foreign investment, free-trade zones, etc.) (Rodrik, 2008).

Thus, today the discussion is focused on "how" industrial policy should be carried out rather than on "whether" it should be carried out at all. When the dispute was focused on the "whether" of industrial policy, the debate on industrial policy has reached a stop. According to Rodrik (2008), by focusing on the "how" of industrial policy it is possible to move the debate forward. In particular, it is possible to design institutions that take into account and ameliorate the informational and political problems that have preoccupied industrial policy skeptics. It is possible to start seeing these problems not as insuperable obstacles, but as difficulties that a targeted policy has got to tackle. Governments cannot give up social or macroeconomic policies, when they face similar difficulties.

As mentioned before, today industrial policies are intended as programs aimed at supporting, promoting, and expanding the market, as well as a mix of instruments available to public authorities to support the development of productive activities. Industrial policy is a set of actions that includes the definition of collective rules for

the protection of the market and the regulation of those activities offered under the restriction of competition. It includes support for innovation and structural transformation of the economy. It includes interventions in favor of the industrialization process in a territory or promoting competitiveness in favor of specific categories of businesses that are essential to the local development. It also includes sectorial vertical policies or related to specific companies that the government considers essential for the preservation of its economy. Nonetheless state interventions is also driven by other motives.

Thus, Rodrik (2008) specifies that education and health interventions are motivated by human capital externalities, social insurance by asymmetric information, and stabilization policy by aggregate-demand (Keynesian) externalities (to list just some of the most important market failures). Empirical evidence on these market imperfections is imprecise, which is why there continue to be animated academic debates on their role and magnitude (Rodrik, 2008).

Moreover, in each one of these areas bureaucrats have wide autonomy in implementing policies, while ignoring the nature of problems. According to Rodrik (2008), governments make budget allocations with little capacity to evaluate the impact of their decisions. Thus, basing their decision on bureaucratic routine rather than economic logic. Lobbies typically apply significant influence on the policy process. In the case of the US, Rodrik (2008) explains that in education, teachers' unions have a loud voice on what should be done. In health policy, insurance firms and the medical doctors' association often impose their requests. Tax and spending decisions are both subject to influence of lobbies. Apart all these limitations, the debates in these policy areas are rarely ever about "whether" the government should be involved; they are about "how" the government should run its policies.

Thus, now the focus is on the objectives and the way through which they are reached. As Rodrik (2008) claims, industrial policy «is just another government task that can vary from routine to urgent depending on the nature of growth constraints a country faces».

1.5 THE INTERNATIONAL DEBATE TODAY

Today the debate is mainly focused on the objectives that the government intervention should have in the economy. These goals can be briefly summarized as (1) solving market failures, (2) reaching strategic economic goals, (3) achieving meta-economic objectives.

Market failures occur in some specific circumstances in which policy interventions have often been considered necessary. Typical situations in which markets fail can be broadly identified as concerns public goods, externalities, non-competitive and incomplete markets, and information. In these cases, markets failures come to the attention of policy makers when market outcomes are not those expected by the government. In other words, the government intervenes in the market when the market itself fails to reach the desirable goals for the society.

In other cases, the government's industrial policy has the aim of promoting the achievement of goals of strategic-economic importance. These goals are pursued in the name of the national interest and citizens' welfare, thus going beyond the mere correction of market failures. In these cases governments identify a set of goals that have been defined to be strategic for the whole national economy. These goals can be grouped in different categories, such as the improvement of competitiveness, the acceleration of growth, structural adjustments, industrial development, industrial and economic independence, export promotion and import substitution, innovation and technological upgrading, the definition of measures to fight crisis, and recession (Di Tommaso and Schweitzer, 2013). These goals are usually pursued through the targeting of specific sectors considered for some reason to be strategic, such as coal, steel, textiles, automotive, shipping, defense, transport and construction. Recently, new trends have identified other sectors as being strategic, such as green industries, energy, ICT, aerospace, biotechnologies, etc.

This type of intervention has been widely used in the past by countries aiming at the development of main strategic sectors. Among the others, European countries and Japan after World War II, and the US in the 1970s promoted policy interventions in specific sectors judged to be strategic and of national interest (Di Tommaso and Schweitzer, 2013).

Finally, the last goal that government might be willing to achieve through its interventions is defined as meta-economic. With this term, we refer to a broader category of goals that has less to do with mere industrialization and growth. This is the case of state intervention aimed at the achievement of goals that go beyond the economic issues and rather include the distribution of wealth on the territory, reduction of any kind of disparities, environmental sustainability, and access to merit goods and satisfaction of basic needs. One typical example is equity in the distribution of social goals. Equal access to education or health can be favored by specific government intervention aimed at encouraging the production and diffusion of these goods. On the other hand, the government can discourage the production of goods named as non-meritorious, such as pollution.

Broadly speaking, the government might be willing to pursue a general equity and balance in the society, thus smoothing all type of differences. Policies in this case would be focused not only on the decrease of wealth inequalities, but also on the reduction of social inequalities (thus concerning the access to voting rights, freedom of speech and assembly, the extent of property rights, the access to education, health care, quality housing, traveling, transportation, vacationing and other social goods and services), racial inequalities, gender inequalities, territorial inequalities, and inequalities in opportunities.

While western countries have always privileged broad goals of development, performing lower growth rates, observing China, it is clear that the government's first concern since the Opening-up has been the acceleration of growth pursued through long-term planning and industrial policies. Thus, governments play a great role in development, shaping the country and its future.

As will be deeply described in the following chapter, China has always given a great importance to interventions aimed at the achievement of strategic goals: starting with more traditional sectors of the industry, then followed by policy of opening up, industrial development, acceleration of growth through targeting of specific territories, ending up, recently, with the development of specific sectors such as green industries, software and ICT.

On the other hand, market failures (and their solution) do not seem to concern the Chinese government, together with the meta-economic goals. Only in the last few decades it is possible to find an explicit declaration of intents in the five-year plans of the decrease of inequalities and provision of those goods not strictly connected to industrialization and growth.

The aim here is not to define which model works better. The Chinese case has come to my attention since it is a territory in which industrialization has been promoted through industrial policy and planning (five-year plans) and justified for strategic reasons (Chang, 1996; Nolan, 2001; Di Tommaso & Rubini, 2012). On the other hand, it is becoming clearer and clearer that the Chinese interventions and planning had not considered collateral effects and that China has excluded from its objectives the resolution of market failures and only recently has started to pay attention to those goals that here have been named as "meta-economic".

1.6 THEORY ON INEQUALITIES

Geographical differences are a structural feature of industrialization processes. Industry, capital, and labor do not evenly distribute with respect to territory. On the contrary, industrialization has always produced differences among geographical areas (Marshall, 1890; Weber, 1909; Lösch, 1940, Feldman, 1994; Krugman, 1991a, 1995, 2011).

In some cases, these differences are huge and tend to establish dual balances (e.g. urban vs. rural, north vs. south, east vs. west, coastal vs. inland areas, center vs. periphery) (Lewis, 1954; Boeke, 1953). In other cases, dualisms multiply and interconnect with each other, shaping a geography of production consisting of territories that show different levels of involvement in the processes of industrialization. From a dynamic perspective, it is clear that the processes of

industrialization can stimulate agglomeration phenomena or relocation. Thus, the territory is continuously challenged by changes in balance and existing dualisms (Becattini, 1989; Swann et.al, 1988; Krugman, 1991b, 2011; Corò & Micelli, 2006).

In other words, industrialization also means imbalance between territories. Furthermore, industrialization processes have historically proven to be able to be limited by such imbalances.

In this framework descriptive analysis of the relationship between industrialization and territory can offer an important contribution to the debate by highlighting the existence of a plurality of paths which although relying on different spatial balances, have shown varying degrees of success and sustainability over time.

Likewise, descriptive studies can offer important contributions to the analysis that also has objectives of a normative nature. It is possible and legitimate to argue for example that a process of industrialization "geographically balanced" is normatively more desirable than another process that instead determines, consolidates or emphasizes differences among territories. Cases of industrialization based on strong differences among regions may appear to policy makers, or even to citizens, not only "unfair" but also undesirable and socially unsustainable over time.

Additionally, on the one hand historical experience of industrialization has highlighted the persistence or worsening of territorial differences, while on the other hand, economic policy measures have for a long time attempted to reduce these differences. For example this is the way policies in favor of territorial balance in Europe have always treated strong imbalances and differences between territories strongly connected to a high degree of industrialization (Di Tommaso, Sarcina & Bonnini, 2013).

1.7 FINAL REMARKS

Government's intervention is driven by its goals which can be summarized into three broad categories: resolve market failures, pursue strategic economic objectives, and achieve meta-economic goals. In history, every country and government has tried its own recipe mixing different policies trying to achieve one or more of them. China comes to my attention since it is a case of considerable economic growth, accompanied by heavy state intervention. However, to a closer look, it is possible to notice that intervention was mainly focused on the achievement of strategic goals, leaving aside the other two categories mentioned above. As described in the following paragraph, China is now reconsidering its policies and paying more attention to a broader range of goals to be achieved, such as meta-economic objective.

2 HOW CHINA DIFFERS FROM TRADITIONAL MODELS OF DEVELOPMENT

2.1 RECENT ECONOMIC HISTORY OF CHINA

In the history of China it is possible to observe an interconnected process of social, political, economic and ideological development. This is found in terms of the main objective of reaching wealth and abundance of goods in an egalitarian society.

This view of the society in China took the name of Maoist Paradigm, because of the principles on which Mao founded its thought. It is inspired by Marxism and Leninism, and accompanied China in the transition to socialism. In particular, some basic theories of the Marxism-Leninism were re-developed in a way that they capture different aspects of the social, political, and economic life.

The overview of the historical background of China presented here will make better understand the importance of the paradigm in the Chinese development. After several decades of wars and disorders in the country, China in 1949 was finally controlled by the Chinese Communist Party. China was at that time a country where heavy industrial manufacturing had decreased in production; consumer goods were at a very low level and the agricultural system was damaged. These problems were further emphasized by the structural problems that China had aslo always experienced before the wars, such as shortage of resources endowments. Natural disasters due to rapid climate changes and the scarcity of arable land areas brought China to famines and crop failures several times. Also, the country was characterized by high levels of inequalities in the distribution of land and of incomes. In 1949 more than half of the whole arable land was owned by rich landlords and peasants (Hunt, 1989).

When in 1949 the Chinese Communist Party took power, it had to tackle two main tasks: reconstruction of the capital stock and starting the transition toward socialism.

In the beginning of this process, the Chinese leadership developed a centralized-authoritarian socialism based mainly on central planning. Agriculture was the main source of finance for state investments in the heavy industrial sector. The state used compulsory state buying quotas and influenced the terms of trade. In this context, output in agriculture and in the heavy industry grew rapidly.

Soon, by the end of the '50s, the Chinese government understood that rapid and sudden growth could not be sustained for the long term. The growth that China initially experienced was mainly due to the fact that rural infrastructures were rebuilt and the land reform had produced a positive attitude among the population[1].

Furthermore, the population was increasing fast at about two percent every year. In particular, the rural population was suffering because of the increasing exploitation of agricultural resources that were used to finance the industrial sector. In turn, their per capita income was low and in continuous decrease. For these reasons the Chinese leadership perceived the need for change and realized its own capacity to rely on the experience of mass mobilization and of socialist administration gained before 1949 in the north of the country. It was believed that this experience had provided the foundations for an alternative development model in contrast to the Marxist-Leninist-Stalinist paradigms.

At this point of the Chinese history, the figure of Mao emerged and his ideas started to be more and more supported. He claimed that the future of the Chinese Communist Party depended on the capacity of the Party to gain the support of the peasant masses. Its view was mainly based on the relevance of listening to the peasant needs and accepting their suggestions. By the end of the '50s and for the following two decades, policy statements and policy actions clearly showed the contents and significance of the Maoist thought.

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[1] The land reform allowed a redistribution of lands in favor of poor individual peasants; after the redistribution process, the reform promoted the creation of mutual aid teams in which resources of households were grouped together but cultivation was still run on an individual basis. Afterwards, basic cooperatives were created in order to concentrate land and resources while property rights did not change. Finally, at the end of the '50s, these cooperatives became larger and were included into advanced producer cooperatives in which resources were shared among participants. In 1958 these advanced cooperatives became communes - larger units of collective economy and government.

In brief, the main points that have characterized the Maoist perspective are: (1) material wealth reached through economic development focusing policies on the abolition of income inequalities and on the establishment of socially owned productive properties, (2) creation of the economy's productive capacity and formation of social production through social ownership of the means of production, social control of production decisions, and social control of the distribution of the product, (3) construction of a modern heavy industry sector, (4) social and economic transformation guided by the mass of the population which, in an underdeveloped economy like China, is mainly composed by peasants, and (5) promotion of economic and political equality between regions and the minimization of income differences among the population.

Following these perspectives, Mao formulated a set of policies to be implemented in the country, ranging from agricultural taxes, price policy, and allocation of collective farm revenues on the basis of costs of production and management expenses. These policies were later followed by the mobilization of labor in the agricultural sector during the slack season in order to stimulate large-scale labor intensive capital formation and by the development of heavy and light industries in the rural areas. In this way, the development of a small and medium scale light and heavy industry was a pragmatic response to the structural problems that had always characterized China. During the Maoist era other policies were also implemented, such as the maximization of the aggregate rate of investment. the land reform (see note 1); promotion of new technologies in order to maximize the output especially in the state-owned heavy industries, price policy and tax policies aimed at the maximization of the surplus and at the expansion of the agricultural sector.

It is possible to affirm that Chinese economic growth during this period of reforms had good performance both in agriculture and industry. This is particularly true if we consider the initial poor conditions of the country and the shortage of resources.

Nonetheless, studies indicate that the initial high levels of growth were then followed by years of low increases in output especially in the agricultural sector. Some researchers (Hunt, 1989; Paine, 1976) claim that the decrease in output growth can be attributed to the fact that China, after few years of substantive growth,

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had reached by the end of the '70s its self-sufficiency level thus satisfying human consumption requirements. Also, it has been assessed that after 1978 the reduction of inequalities came to a stop and the portion of the population in conditions of absolute poverty was about ten percent. Furthermore, great inequalities persisted among regions and within regions, though inequalities between neighboring villages and between members of the same production communes had a little decrease (Hunt, 1989). The type of centrally planned economy that was put in place from the 1949 until 1978, brought structural imbalances that favored industry over consumption (Yueh L. Y., 2010). It was the time for change. Living standards were not much better that twenty years earlier, state-owned sector produced almost all the industrial output, and average wages were lower. China gave strength to industry and generated innovation, but living conditions, technology advances and productive efficiency did not benefit from it. Chinese industrial growth is mainly due to a great increase in factors of production, rather than in the improvement in the efficiency of factors (Yueh, 2010).

In 1978, economic development had become a top priority for Chinese government. In order to achieve this objective, the economy became market-oriented. At this time China started to grow at high rates of GDP (9% on average from 1978 to 2009).

Chinese government implemented its reform strategy gradually and through a sort of experimentation that gave the possibility to test reforms regionally. In this context, the reform process started in the countryside, where township and village enterprises (TVEs) were created. This form of enterprise was able to transfer elements of industry into the rural economy. In this way, part of the surplus of labor found its allocation. Also, the Household Responsibility System gave the possibility to farmers to earn higher salaries derived from their work in the communes and based on their efforts. Between 1978 and 1985, agricultural production increased by 67% thanks to the increase in productivity caused by the incentives (Yueh, 2010). Furthermore, by the end of 1984 the control of the state on commodities was reduced greatly and limited to few products.

In 1985, further reforms were taken in order to limit the intervention of the government in the definition of prices, thus allowing the market to define the

allocation of resources. Studies suggest that even after the liberalization of agricultural output, the process was not fully implemented and was performed in a discontinuous manner (Yueh, 2010). By the end of 1990s, agricultural output slowed down and decreased as a share of GDP from 30% in 1979 to 10% in 2000s.

Nevertheless, these measures were judged successful and their use was further implemented in other fields of the economy. In 1984, the Chinese government introduced these types of reforms in the state-owned enterprises (SOEs). Until that time, SOEs were characterized by inefficiencies due to unbinding budget constraints that caused companies to have no incentives to minimize costs. Most of them were subsidized loss-makers considered as social security tools to sustain full employment. Reforms allowed managers to have more decisional power and to receive part of the enterprises' profits.

Furthermore, in 1984 the "dual track" pricing system was launched. With this system, SOEs were allowed to sell the excess of output. In this way, products could have a state-set price and a market price. The purpose of this system was to enable enterprises to tackle with market competition without creating abrupt cuts with the planned system. Together with these reforms the government introduced a great innovation to the institutional system which was called Contract Responsibility (CRS). It consisted of the possibility for firms to keep a certain quota of profits earned and re-invest them or use them to pay bonuses to employees. In this way, wages became later linked to performances and SOEs became more and more autonomous (Yueh, 2004 and 2010). These reforms were firstly perceived as successful, but in the late 1990s the first weaknesses started to arise. SOEs continued to demand subsidies from the government even though their profits increased. Furthermore, the reform did not change the budget constraints and most of the SOEs were experiencing losses. The CRS was abandoned in 1994 and replaced by a new reform - the so called corporatization.

Corporatization was considered as a light form of privatization, the purpose of which was to favor the creation of market incentives through a clearer definition of property rights. Most of the SOEs were transformed into limited liability companies and by 2001, the SOEs decreased in number by about 50% with respect to 1994

(Yueh, 2010). By the end of 2001, most of the SOEs had been restructured, corporatized, sold, or out of business for bankruptcy. This was the result of the strategic realignment through which the Chinese government decided which sectors of the SOEs could be given away. This reform culminated with the highest rate of urban unemployment since the beginning of the reform process. Thus, there was still need to make some changes to the system. With this aim, in 2005, the Chinese government announced a new reform, the aim of which was to convert all non-tradable shares into tradable shares in order to make them more attractive to small investors. The result was that the number of loss making SOEs diminished by more than half, the output value and value added of the SOEs increased, and profits improved by ten-fold in less than 10 years. In brief, the few SOEs still in business were more efficient compared to those in the pre-reform period (Yueh, 2010).

Furthermore, in those years the Chinese Government initiated a process of liberalization of Township and Village Enterprises (TVEs)[2] through which they became production units run like business enterprises. In this way, people who worked for TVEs could share the profits, thus increasing wages. By the end of 1990s, TVE started to decline for several reasons including inefficiencies due to ill-defined property rights, higher competition from domestic and foreign firms, WTO accession in 2001 and the rise of the private sector. TVE have been a great trigger for growth even though they had difficulties surviving in the second period of reform. It is believed that the initial success of the TVE was due to the surplus of labor in agriculture. The revival of the agricultural industry is now back in vogue because of the low income in rural areas and the high rate of population still living in the countryside.

In this framework, privately owned firms were initially hindered by the notion of communal property that was at the basis of the Communist thought. In 1987, the Chinese government recognized the importance of privately owned enterprises and began to consider them as a «necessary supplement to the state sector» (Yueh, 2010). Nonetheless, private firms were still considered as business activity started by

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[2] TVE were economic units that were either collective owned or owned and controlled by rural citizens. In reality, before the reform was implemented, they were controlled by the local government.

people that for some reason were temporarily outside the economy such as unemployed, retired, and farmers. One of the reasons why the private sector did not take off was that the law system in this field was very poor and did not favor the development of new private businesses. In this perspective, in 1997, the government recognized the private sector not only supplemental, but also necessary, to the state sector and as a fundamental part of the economic system. The private sector started to be encouraged with laws giving equal protection to private and public sector. Nowadays, the number of private firms has increased thanks to a greater opening of the market. However, most of them are small and medium sized enterprises and still face difficulties with property rights protection.

In 1978, the Open Door Policy was launched and market-oriented measures were started in order to attract investments, develop manufacturing skills and increase export capacity. In 1979 the Law on Joint Ventures was adopted. Through this law, foreign investments were granted a legal status. At the very start of this reform only Chinese-foreign joint ventures were permitted. The aim was to allow Chinese firms to learn from foreign investors. In a second phase of the reform wholly-owned foreign owned firms were permitted.

One of the first steps made under this reform was to create the Special Economic Zones (SEZs)[3]. SEZs were first established only in four places as experiments through which the government could verify the effect of the policy before extending it to the rest of the country. They were created in Shenzhen, Zhuhai, Shantou, and Xiamen; all considered as strategic places because of their proximity to Taiwan and Hong Kong. In the SEZ, investors could find special conditions to settle their businesses, such as preferential tax policies, incentives, and infrastructures. Furthermore, China increased the level of government decentralization, thus allowing the local government to implement reform enjoying greater autonomy in decisions made on foreign trade issues.

It was only after Deng Xiaoping's visit in Southern China in 1992, that these reforms took off. The aim of SEZs was to promote international trade by favoring the development of export processing zones. In this way, foreign investments

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[3] See in depth paragraph on SEZs in Guangdong (par. 4.3.1)

increased by 15% in 10 years (from 15% of GDP in 1990, to 30% in 2000) and China affirmed its strength in the global market (Yueh, 2010). This was also favored by the fact that the burden of bureaucracy was enormously reduced and the cost of labor was extremely low.

Nonetheless, there was still some constraint to the establishment of foreign firms in SEZs even after the accession of China to the WTO in 2001. This limited the investment of foreign firms that found it difficult to start their businesses in China and to penetrate the Chinese domestic market.

Once the economic growth of China started, the Chinese government oriented its intervention to other fields, such us technological upgrading, strengthening of competitiveness, protection of infant industries, reduction of regional disparities. Finally in 2008, the global financial crisis decelerated the Chinese growth. At this point, China faced its weaknesses due to the strong dependency on foreign demand. The Chinese model showed fragilities in the outward-oriented industrial strategy and the government was finally engaged in the implementation of a new strategy aimed at stimulating the internal market (Di Tommaso et al. 2012).

2.2 FEATURES OF THE CHINESE MODEL

China represents a new model of development in several important respects: industrial upgrading efforts are often domestically driven, within this domestic market there is intense competition between both domestic and foreign firms, and this competition is driving and stimulating the upgrading efforts of domestic firms. The interest in defining the characteristics of the Chinese success comes both from those who fear and those who support the country.

China is one of the Asian countries in which the rules of the Washington Consensus were not fully applied and that performed extremely well in terms of economic growth. Especially at the beginning of the reform during the 1980s and 1990s, People's Republic of China maintained high barriers on imports. After the first

decade of enormous economic growth, the government agreed that it was the right moment to start a policy of trade liberalization. According to Rodrik (2006) it was the initial growth that gave the chance to the government to implement a trade liberalization policy while in other cases in which the rules of the Washington Consensus were applied trade liberalization was used as a policy tool since the beginning with the aim of starting the process of growth. On the other hand it is stated (Lee, 2006; Lee et al., 2006) that the reasons of the success of China and a few other Asian countries, such as Taiwan and South Korea, can be found not only in the application of policies in a determined sequence, but also to the fact that some of the policies prescribed in the Washington Consensus were actually not applied. In (Figure 2.1), it is possible to observe that China applied only partially the dictates of the Washington Consensus, thus creating its unique formula of growth.

Figure 2.1. Washington Consensus vs. China's policy tools

Elements of the Washington Consensus	China's policy tools
Fiscal discipline	Yes
Reorientation of public expenditures	Yes
Tax reform	Since 1994
Unified and competitive exchange rate	Since 1994
Trade liberalization	Started slowly after accession to WTO (2001)
Openness to FDIs	Only in some strategic sectors
Privatization	Partially implemented, some SOEs still active
Deregulation	Limited
Secure property rights	Partially implemented
Financial liberalization	Partially applied since the 1980s

Sources: author's elaboration on Rodrik (2006) and Lee et al. (2006).

In addition, the Chinese government implemented other policies in fields not included in the Washington Consensus: exports were strongly promoted together

with the introduction of import tariffs, technological upgrading was extremely incentivized since the mid-1990s, and spreading of higher education was highly stimulated (Lee, 2011).

As already widely explained in the previous paragraph (2.1), China paid much attention to the protection of local firms, especially infant industries, and to the promotion of exports. The turning point for the trade strategy happened in 2002 when the Chinese government encouraged domestic companies to invest overseas with the «go global» strategy. In this way the Chinese government satisfied the need to create new brands, to access new markets, and to increase the stock of natural resources (Hess, 2006).

China implemented a strong strategy in order to increase R&D expenditures and favor technological upgrading. In 2000, R&D expenditures were 1 percent of GDP, while in the last few years it has already increased by 0.7 percent. R&D and innovation are now replacing the role that FDIs had in the initial period as engines of growth. Additionally, local learning institutions have been recently established and the access to foreign knowledge has been increasingly encouraged. These strategies are considered as critical factors for growth and catch-up. In the initial stages of the Chinese development, the government favored the joint ventures partnerships in order to apply the strategy of «trading the market for technology». With this strategy, China skipped some stages of the development process, especially, in terms of production of certain technologies. In later stages, the government tried to link academic institutions to industrial businesses and stimulate the creation of knowledge and new technologies for commercial purposes.

In terms of higher education, the Chinese government succeeded in increasing the number of enrolled students by 20 percent every year since 1998. Furthermore with the 211 Project, launched in 1995 and the «Invigorating the country through Science and Education Strategy» in the last decade Chinese scientific production has significantly increased. (Lee, 2011).

In 2004, the combination of policies that had characterized the Chinese development was defined as the Beijing Consensus as opposed to the Washington

Consensus. Ramo (2004) stated in the book *The Beijing Consensus* that the Chinese growth had to be considered as a model for other countries of the world seeking development. He wrote that:

> *China is marking a path for other nations around the world who are trying to figure out not simply how to develop their countries, but also how to fit into the international order in a way that allows them to be truly independent, to protect their way of life and political choices in a world with a single massively powerful centre of gravity. I call this new centre and physics of power and development the Beijing Consensus. (Ramo, 2004, pp.3-4)*

He declared that the three main pillars of the Beijing Consensus were development based on innovation, sustainability and equality as main objectives, self-reliance in international relations and policy decision-making.

These ideas have been later discussed and opposed by a number of economists (Dirlik, 2006; Kennedy, 2010; Nathan, 2003; Nye, 2005) claiming that China's economic growth has generated several problems such as pollution, enormous consumption of energy, inequalities, corruption, etc. Furthermore they believe that China's growth cannot be replicated in other places because of some intrinsic features of the country (abundant workforce). They also criticize the mix of planned and market economy directed by an authoritarian government.

Li et at. (2010) have tried to reply to these critiques by saying that there is no case of a country growing at these rates without facing problems. They support the idea of an authoritarian system as a feasible type of government since the Chinese one demonstrated a great flexibility and self-sufficiency. They see the Beijing Consensus as a counterpart of the Washington Consensus and, finally, they suggest a list of ten principles that summarize the main characteristics of their idea of Beijing Consensus:

1. Use of localized policies shaped on specific characteristics of the region;
2. Find the right balance between market and planned economy;
3. Flexibility in design and implementation of policies;
4. Independence and freedom from other countries in policy decision-making;
5. Stable political environment domestically and internationally;

6. Self-sufficiency (after learning from other countries);

7. Continuous technological upgrading especially in strategic industries;

8. Development of domestic innovation (technological and institutional);

9. Slow and thoughtful liberalization of financial markets;

10. Harmonious society reached through letting people that get rich first help poor people to prosper;

Finally Enfu and Xiangyang (2011) define the Chinese model as system made of a "quadruple structure". In the first layer there are four pillars: namely, public ownership in a system in which also domestic and international private firms are allowed as long as they respect the qualitative and quantitative standards, labor value based on the principles of efficiency and equity, state adjustment in a market system - meaning the role of the state in achieving the optimum allocation of resources, and balance between innovation self-reliance and foreign technological upgrading. The second layer is the political framework in which the union of Party's leadership, people and laws create favorable conditions for growth. The third layer is culture life which is believed to be the source of cohesion and creativity for the society. The fourth and last layer is represented by social development, meaning the idea of harmonious society pursued by the state.

The concept of Beijing Consensus is now more and more used alternatively to the expression "China Model". It has been named also *Comcapitalism* to indicate the fusion between China's communist political legacy and capitalist economic practices implemented during the reform era (Zhang & Sun, 2012). Also in this case the authors identify some specific features that make this model different from others: China's growth is driven by an internal motive deriving from the willing of the Communist Party to change policies gradually, high efficiency of the government due to the hierarchical organizational structure, experimentation of policies learnt and adapted from other countries' experiences gave to this model an extraordinary capacity of adaptability and assimilability, gradualism in the implementation of liberalization in politics and economy, and lastly, economic growth as a top priority.

Finally, the expression of Beijing Consensus assumes in some cases different meanings. These terms sometimes identify the success of China in opposition to the problems that the Western countries are now facing. On the contrary, they are also used to identify the phenomenon of China's increasing influence in the world economy, meaning the threat that it might represent in certain fields (Ortmann, 2012).

In conclusion, looking at the Chinese case in the light of what has been said in the previous chapter it is thus clear that the massive industrial interventions have been justified within the framework of the government-led strategy of growth (Di Tommaso & Rubini, 2012; Di Tommaso & Schweitzer, 2013). With its "national strategy" for industrialization, China has implemented three decades of national and regional policies all defined in long-run planning aimed at the acceleration of growth and industrialization.

Since 1978, when the Deng era began, this idea of government intervention in favor of the strategic economic interest of the country has been one of the main characteristics of the Chinese industrialization process. Picking strategic sectors has been a decisive activity in the industrialization strategy promoted by the Chinese government. During the last three decades of massive continuous growth interventions have been promoted in those industries judged to be strategic for the future of the national economy. Furthermore, structural change interventions have been promoted in order to favor a shift toward those activities declared strategic. Industrial policy programs to protect and to encourage the development of strategic "infant industries" or to support "national champions" have also been pillars of the general strategy of Chinese industrial development.

Also, the set of reforms launched in 1998, gave the start to an unprecedented period of growth. Reforms were aimed at solving the problem of bankruptcy of state-owned enterprises and the banking system. The main changes that have affected China since 1998 are related to the establishment of a self-sufficient banking system, the establishment of corporations replacing the state-owned enterprises run by the government, the creation of a new legal system, the inclusion in the WTO, the development of a housing market, and the reduction of barriers to the movement of

people (OECD, 2013). Nonetheless, in the last few years growth seems to have slowed.

Thus the definition of a set of priorities and strategic sectors on which government should focus its policy efforts is at the center of the country's planning and industrialization strategy. In the 12th five-year program for China's Economic and Social Development adopted at the Fifth Plenum of the 17th Communist Party of China's Central Party Conference Central Committee seven strategic industries were clearly listed (Di Tommaso & Schweitzer, 2013):

- Alternative-fuel cars (hybrid cars, electric cars, fuel-cell batteries),
- Biotechnology (biomedicines, new vaccines for disease prevention, advanced medical equipment, marine biology),
- Green industries (energy-saving technologies, pollution control, clean coal, waste-matter recycling, seawater exploitation),
- Alternative energy, including next-generation nuclear power plants, solar power, wind power, smart grids, bioenergy,
- Advanced materials, including rare earth minerals, special glass, high-performance steel and fibers, composites, engineering plastic, nano and superconducting materials,
- Information Technology (IT), such as cloud computing, high-end software, virtual technology, new display systems,
- High-tech manufacturing of products including aircraft, high-speed rail, satellites, and off-shore equipment.

In this framework the Chinese Government has announced a set of policies to support basic research, R&D in some key technologies, education system modernization in some selected disciplines, and major state-level science and technology projects. The government has also announced targeted fiscal policies and an increase in investments in order to support domestic innovation and the industrialization of scientific research. Finally, the government is going to launch tax and financial policies to develop and reorganize the structure of the seven industrial groups including guiding and encouraging mergers and acquisitions to increase manufacturing industry concentration and efficiency. Considering all these

announcements, the Chinese government's strategy clearly seems to go in the direction of promoting strategic industries in name of national interest.

Nonetheless, OECD sounded the alarm of a problem of middle-income trap in the medium-term and suggests that this might be partly due to structural factors that need to be solved through reforms (OECD, 2013). In particular, OECD suggests increasing the efforts in innovation, reforms in the financial market, reforms of the land rights, changes in the labor market, reforms in the taxation system, and a switch to a sustainable use of natural resources.

2.3 CHINA TODAY: BETWEEN INEQUALITIES AND ECONOMIC GROWTH

For a long time, the debate on the problem of territorial imbalances in terms of industrial development has caught the attention of several researchers and policy makers. Industrial policy is identified as one of the factors that influence these imbalances. Policy intervention in fact, is sometimes used to mitigate the spatial diversity in an attempt to increase in some areas the concentration of elements that determine industrial development, such as labor, capital, infrastructure, and education. However, in some cases industrial policy has contributed to increase or generate these imbalances.

China's case is emblematic because it is one of the places where the policy action was massive and was accompanied by very high industrial performance. Such performances, it is clear in the literature (Biggeri & Hirsch,2008; Fan C. C, 1995; Fan & Sun, 2008; Fan, Kanbur, & Zhang, 2009; Fan, Kanbur, & Zhang, 2011; Fang, Zhang, & Fan, 2002; Li & Fang, 2013; Naughton, 2002; Wei & Fan, 2000; Zhang & Kanbur, 2009), are not uniformly distributed on the whole territory. Fan et al. (2011) show that from 1952 to 2008, China has had three peaks in terms of inequality, especially during the Great Famine, at the end of the Cultural Revolution, during the current period of global integration. Similarly, the authors point out three

stages in which the Chinese territories had the lowest inequality: in 1952, at the beginning of the data series used in the analysis by the authors, in 1967, during the years of recovery after the Great Famine and before and in 1984, at the end of the period of agrarian reform and before the start of the expansion due to global integration. In general, inequality appears to have decreased in the periods in which policy makers supported the use of policies in favor of agriculture and the rural sector, but increased in the phases in which these fields were abandoned.

It is possible to affirm that regional inequalities in China have been partially influenced by government policies. Fan et al. (2011) argue that there is a strong association between the policies put in place since the 1950s and the inequalities that still characterize the entire Chinese territory. In the 1950s, China has focused its development efforts on a single priority: heavy industry. Probably influenced by what was happening in the Soviet Union, the government limited the prices of agricultural products, in order to extract more resources to be allocated to the financing of heavy industry. In addition, the government imposed a system of household registration (*hukou*) in order to give stability to the labor supply in the agricultural sector confining people to work in their place of birth. Meanwhile, in urban districts, residents enjoyed easy access to food, housing, education, jobs in state- or collective-owned enterprises.

The development strategy in which the industry was the driving force to the economy, culminated in the Great Leap Forward, which eventually led to the Great Famine in the late 1950s. The inequality between urban and rural areas reached its peak with the Great Famine and then at the end of the Cultural Revolution (1966-1976). This strategy led to nearly three decades of economic stagnation. Fearing that it could bring to a new and more terrible famine because of the meager performance achieved in agricultural production with the system of collective agriculture, at the end of the 1970s the central government moved the strategy development towards more labor-intensive sectors: initially agriculture and then rural industries exports-oriented. The rural reform guaranteed farmers the right to cultivate the land and make their own independent production decisions. The reform stimulated an increase in agricultural production and farmers' incomes. Labor productivity increased, thus creating a surplus of labor in the agricultural

sector. Moreover, the increase in household income in rural areas led to an increase in the demand of manufactured goods. In turn, this led to new development opportunities for the labor intensive Town-Village Enterprises (TVEs).

In the 1980s, China decided that the opening to the rest of the world is its own development strategy. In this way, the competitive advantage of coastal areas began to increase. The coastal areas benefited extensively and from the very beginning of the opening strategy undertaken by China because of their proximity to international markets and to the more advanced economies. In less than twenty years, China has become the largest recipient of FDIs among developing countries. As a consequence of this, the coastal regions have shown to experience rapid growth that has led to the increase of the gap between coastal and inner areas.

In those years, China also started its transformation from a planned economy to a market economy. A number of policies were introduced in order to regulate the migration of people thus trying to solve the labor surplus in rural areas. This, however, caused a massive migration to urban areas where job opportunities were greater. Controls on prices became more and more relaxed until the mid-1990s when prices and quantities of most of the products were determined by the market. The government then carried out massive investments for the construction of roads and railways in order to reduce transportation costs. These investments, however, did not facilitate the reduction of regional disparities between rural and urban areas, which remained unchanged, while the disparities between the coast and inland areas increased (Fan et al., 2011). In order to provide additional incentives to local governments with the aim of developing local economies, the central government launched a tax reform that tied spending to local revenue. The fiscal decentralization increased competition among counties, promoting economic growth. Moreover, in this way, local governments could decide autonomously the territorial redistribution.

At the end of the 1990s, to give a response to the financial crisis that hit Asian countries, the government launched the development plan for Western China, in order to fight the crisis and reduce inequality. In this phase numerous investments in infrastructure were promoted. Over the past decade the central government

abolished some taxes (on agriculture, education, etc.) in rural areas and provided subsidies to farmers to support agricultural production and the income of peasants.

China is now a country that is gaining more and more weight in the international context (just think that in 2010 the IMF and the World Bank increased the voting power of developing countries such as China). The Chinese process of change, of industrial development and growth, is still ongoing. After three decades of continuous and uninterrupted growth, in 2008, following the blast of the global financial crisis, China experienced the first slight slowdown. Compared to other developed countries China felt the crisis in a different way - the GDP growth rate decreased very little with respect to the previous year (Figure 2.2). Chu (2010) suggests that this is due mainly to the institutional legacy of three decades of reforms and policies. The reforms that have characterized the Chinese model have been the reason why this system did not experience the threat of the global crisis. Furthermore, the stimulus given to the aggregate demand by finding a balance between the goal of constant employment level and fiscal debt level gave further stability to the economy.

Figure 2.2. GDP Growth rates (annual %)
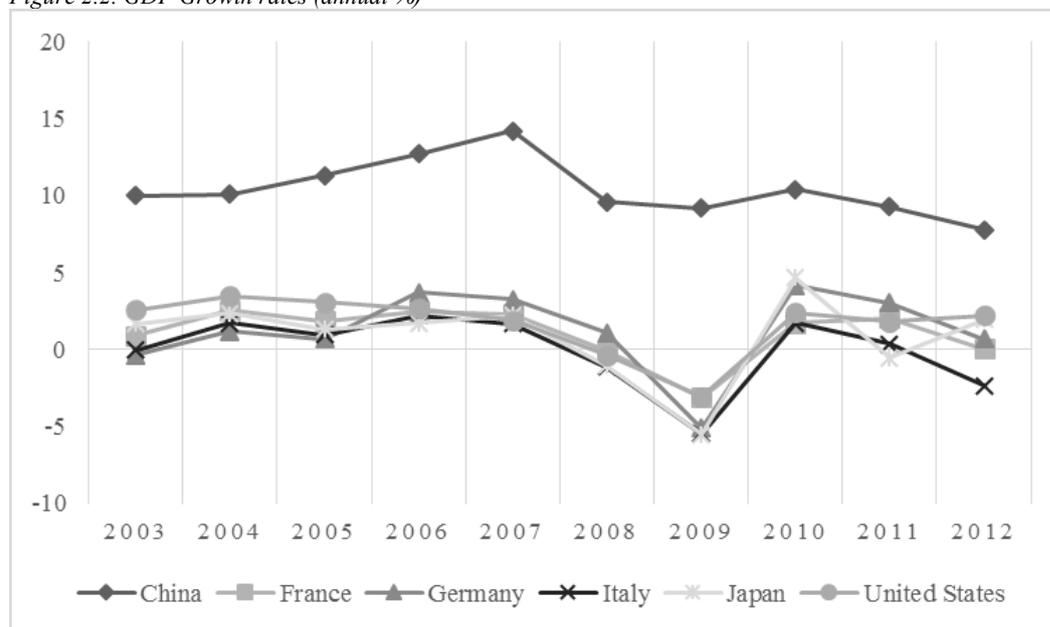
Source: Author's elaboration on World Bank data

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On the other hand, due to the 2008 global financial crisis, the Chinese government has realized for the first time the existence of weaknesses in a system strongly dependent on foreign demand. For this reason, China launched the so-called *Go Domestic* policies which are aimed at encouraging the development of domestic companies (Di Tommaso et al., 2012). This policy, combined with the previous go-global policies, would also enlarge the potentialities of development of China in the long term.

Despite its unrestrainable and unprecedented economic growth, China has been facing the challenge of increasing unbalances that have emerged in economic, political, social and environmental fields. Deng Xiaoping's strategy of «let some people get rich first» has resulted in a society full of inequalities. The Gini Index went from 0.29 in the early 1980s to 0.43 in 2009 (World Bank, 2013). The great attention paid to the achievement of continuous and sound economic growth turned into an improvement of some areas while living standards have remained the same or even worsen in others (Biggeri, 2003; Biggeri & Hirsch, 2008; Stiglitz, 2008; Zhang & Sun, 2012). Promoting policies aimed at openness and industrialization was originally meant to allow some territories to make "controlled leaps forward" in which rules of capitalism have been applied, that were later progressively widened and gradually multiplied; territories of economic (and social) innovation in which capitalism was first experimented; territories that drove the industrialization and growth of the country. Places that after successful experimentations were allowed progressively to infect other areas and spread the intervention of policy. This is a process that is still ongoing and that has lasted for the past three decades in which the accelerated industrialization, structural change, and then the gradual process of technological upgrading has continued to live with the worsening of strong differences between regions (Di Tommaso e al., 2013; Di Tommaso et al., 2012; Rubini et al., 2013).

Thus, the industrialization process fueled dualisms and inequalities involving the territories with different intensities and at different times. Studies demonstrate (Li & Fang, 2013) that industrialization is the most important cause of Chinese regional inequality at the county level and rural-urban and coastal-inland inequalities have increased (Biggeri, 2008). This is one of the most common criticisms that are made

against the Chinese industrialization model (Fan, 1995; Kanbur & Zhang, 1999; Wei & Fan, 2000, Wang, 2007). Such a model would risk collapse if unable to reconcile territorial differences increasingly evident and increasingly socially unsustainable. Thus, in recent years, the policy debate in China has started to show strong concern on the increasing inequalities (UNDP, 1999; Zhang & Kanbur, 2009).

As a communist regime, China must necessarily deal with the problem of inequalities in the name of social justice and of the "harmonious society". Furthermore, growing inequalities in different fields (health, education, rural-urban, coastal-inland, etc.) are blamed to be the reason of growing social discontent and of slow poverty reduction (Zhang & Kanbur, 2009). These unbalances have, in fact, caused discontent among the population which in turn has generated concern in the government. The risk is a deep fragmentation of the territory if the government does not promptly solve this issue. Furthermore the Chinese Communist Party risks to lose its legitimacy since the uneven wealth distribution is against the political ideology of Communism (Zhang & Sun, 2012).

Stiglitz (2008) suggests that now is the time to make some changes to the Chinese model since circumstances have changed and policies now in place are not effective anymore. The pragmatism that characterized the Chinese success needs to be replaced with a new economic model.

Thus, policies in favor of territorial rebalancing are more and more an integral part of the overall design of Chinese growth. Already in the past few years policies were launched with the aim of reducing situations of excessive congestion of productive activity in some areas, or on the contrary, with the aim of reducing underdevelopment in zones that had remained in the margins of the processes of industrial growth (Di Tommaso et al., 2013; Di Tommaso et al., 2012; Rubini et al., 2013).

Now, the goal is to let the whole population enjoy the benefits of growth without differences between territories, social class or ethnicity. The true challenge is to address these problems while maintaining high growth rates and increasing development (Di Tommaso, 2012; Chu, 2010; Zhang & Sun, 2012).

The Chinese government already started making some changes since 2005. A healthy population can have positive externalities on the entire society thank to the reduction in the transmission of infectious diseases (Paci & Schweitzer, 2006). Thus, the government has started to focus attention on health care policies aimed, in particular, at the population of the poor rural areas. In 2009, health care insurance had already covered about 90% of the rural population.

Supporting measures were taken also in favor of agriculture and employment of young graduates, rural migrant workers, and other unemployed (Zhang & Sun, 2012).

China is now moving away from export-led growth and supporting some other measures of development that favor the decrease in inequalities that, in turn, will be advantageous for the entire economy. Firstly, a reduction of the level of inequalities would cause an increase in consumption that would, in turn, bring benefits to small businesses that suffer from the lack of access to credit (Stiglitz, 2008).

Hence, the Chinese government has started to pay attention to goals that differ from the mere industrialization and growth. In its planning and policy strategy the government is starting to promote the wellbeing of the population. In the 11th five-year plan (referring to the period 2006-2010), the Chinese government intended to shift its goals from the pursuit of economic growth in the name of the statement "getting people rich first" to "putting people first" (Fan, 2006). Thus the harmonious society has become one of the priorities reached through employment, social security poverty reduction, education, health care, environmental protection, and safety. In this new strategy framework Chinese leaders seem to continue to emphasize economic growth and industrialization as absolute priorities accompanied by a more harmonious distribution of the benefits (Fan, 2006). For the first time, the plan recognizes the existence of problems occurred during the rapid and massive economic growth such as environmental pollution and the rise of deep inequalities. Thus, emerges a distinction between economic growth and development.

From the 11th Five-Year Plan onwards the policy targets are mainly related to conservation of resources, reduction of pollution, and the increase of human wellbeing. Specific targets for birth control, urbanization, social protection, and education have been identified. Furthermore, the issue of intra- and inter-regional inequalities has come to the attention of the five year plan. For this reason the 11th Five-Year Plan includes a focus on the promotion of "coordinated development among regions" with the aim of reducing inequalities and strengthening the development of slow-growth territories (Fan, 2006).

It must be pointed out that inequalities in China refer not only to the mere distribution of income in different regions or provinces. They are also concerned with the substantial differences within and between urban areas. As demonstrated (Fang, Zhang & Fan, 2002), urban poverty declined from 1992 to 1995, but increased from 1996 to 1998, when major urban reforms were launched. They also state that rapid economic growth has been the major force behind reduction in urban poverty, but the poverty reduction impact would have been even greater if worsening income distribution had been avoided.

The reforms implemented by the Chinese government on the one hand reduced workers' lifetime welfare ties to their employers, thus providing them with a higher degree of freedom to change jobs and achieve higher earning potential. The reforms allowed market forces to determine workers' pay according to their ability. The efficiency gains from urban reform are highlighted by a dramatic increase in per capita urban income with an annual growth rate of about 6% in the 1990s (Fang, Zhang & Fan, 2002).

On the other hand, however, urban reforms and severe competition from other sectors have resulted in soaring financial losses of SOEs and collective-owned enterprises, and an increasing number of urban workers have been laid off. The two opposite forces of urban reforms may have contributed to the deterioration of urban income distribution from 1992 to 1998.

Hence, in brief, urban reforms have released workers' potential and increased efficiency as evidenced by the rapid income growth rate. But while many have benefited from new economic opportunities as a result of urban reforms, some

groups are facing new risk and vulnerability (Fang, Zhang & Fan, 2002). Furthermore, a poor welfare system has caused a rapid increase in expenditures on education, healthcare, and housing. This makes the poor more vulnerable to shocks and malnutrition and less likely to develop human capital, reducing their ability to catch up. Social inequality might cause people to live in a social setting in which they care about their relative positions in a society. High social inequality is often related to low happiness. In addition, large social inequality often leads to more crimes and social instability which, in turn, contribute negatively to investment environment and economic growth. Finally, the increasing gap of social development will reduce the effect of economic growth on poverty reduction. Thus, social inequality is as important as income inequality (Zhang & Kanbur, 2005).

In the era of market reforms the old system of education and healthcare provision was cancelled. First, the increasing fiscal decentralization has reduced the central government's redistributive power. Many local governments, in particular those in poor regions with insufficient revenues, have largely withdrawn from their role in investing in human development. Second, increasing competition has condemned SOEs as it is difficult to serve well the dual task of profit maximizing and welfare provision. As a result, a large number of SOEs have laid off employees and reduced welfare benefits. Third, weak governance at the village level made it difficult to finance public infrastructure in rural areas. Fourth, government could not mobilize vast manpower in public works as they did in the planned era because labor must be adequately compensated in the market economy.

Zhang & Kanbur (2005) examined the spatial patterns of social development indicators. The changing distribution in outcome of education and public health has reflected the evolution of underlying institutions in the process of economic transformation. Social inequalities in rural, urban, inland, and coastal areas have increased since the economic reforms. In particular, the rural–urban gap in infant mortality rate is increasing and the gender gap in literacy is still large.

Investments in education and research sectors together with the enhancement of knowledge diffusion are found to be key factors of the Chinese economic growth (Biggeri, 2003). A well-educated labor force is a key factor to ensuring China's

success in incorporating the challenges of the market economy. In addition, increasing social inequality may increase social instability which in turn affects economic growth (Zhang & Kanbur, 2005).

2.4 FINAL REMARKS

China differs from traditional models of development. It has applied specific strategic policies to specific strategic industries, with the aim of accelerating economic growth and fostering industrialization. This has been pursued through long term planning that has given priority to growth, leaving aside other crucial issues. In the last few years in China it has become clear that the massive, continuous economic growth has produced side costs that cannot be tolerated in the long run. Thus, recently the government has started to focus on the solution of problems such as pollution and inequalities. In this work, I am going to focus on this last issue, territorial inequalities, since I believe that the solution of this topic could assure to China a stable and continuous growth in the future. This topic will be studied for the case of the whole China and then of Guangdong, since this province can be considered as a concentration of all the elements that characterize China, including inequalities.

3 TERRITORIAL UNBALANCES IN CHINA

3.1 OBJECTIVE OF THE ANALYSIS: ASSESSMENT OF TERRITORIAL UNBALANCES IN CHINA

For more than three decades, since 1978, China has experienced extremely high growth rates. This growth has been mainly based on industrialization rather than other factors. As mentioned in the previous paragraphs, Chinese policies have been mainly oriented to reach strategic economic objectives. The focus of the debate has recently moved to the way in which economic growth has involved most of the Chinese territory.

In other words, policy makers and scholars are trying to assess if Chinese economic growth has been territorially balanced and industrialization has been spread uniformly all over the Chinese territory.

Furthermore, it is central in the debate to understand which provinces have benefited the most from industrialization and which areas have experienced higher levels of growth than others. Also investigated is the ability of provinces to improve their situation moving from low-performance to high-performance level or vice versa, to worsen their situation moving from high to low-performance.

Finally, considered the long path of growth that China has been following for more than three decades, there is little information about the trend of territorial unbalances. A decrease or intensification of territorial inequalities could give a clear view of the actual situation of Chinese industrial growth and could suggest future steps for policy agenda.

This chapter tries to address these questions going through different stages of analysis. Firstly, there is the need to consider the Chinese growth in the last three decades. Although in literature there is already wide evidence of the Chinese economic growth, in this case the evidence will be brought through the use of an

alternative indicator that replaces the usual indicators of growth (e.g. gross domestic product). The idea is to give comprehensive information of economic growth through the use of several economic dimensions which represent industrialization, labor, export capacity, and population income.

This will be the starting point for the subsequent step of assessing the existence of inequalities over the Chinese territory. It will be investigated by several means and at different levels. At first, it is important to assess the trend of performances in terms of heterogeneity from 1998 until 2010. In this way, it will be clearer if China has been experiencing a growth or decrease of territorial unbalances over the decade considered.

Then, attention will be focused on the geographical distribution of performances in order to understand where higher performances concentrate. Literature suggests that the Chinese territory can be divided into four areas according to their level of economic performances[4] (Fan, 1995; NBS, 2011; Barone et al., 2013). In this phase it is important to understand the path of provinces during the decade considered. In other words, it is interesting to find out which provinces have led growth for the whole period, which have been lagging behind and which have gradually improved in recent years.

Finally the analysis will be concluded with the assessment of similarities among the areas previously defined. The aim in this phase is to understand if groups of provinces (selected according to different geographic characteristics and according to literature of reference) are similar in terms of distribution of performances. A negative answer to this question would confirm the thesis of a territory marked by great and widely diffused differences.

Accordingly, from a statistical point of view, the work is developed in the following steps:

1. Identification and calculation of the variables at national level and at province level from 1998 until 2010;

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[4] Further details on the areas will be given in the following paragraph (par. 3.6).

2. Calculation for the Index of Performance at national level. In order to do so, it is firstly appropriate to normalize all the variables and test each variable for normality distribution and subsequently, to apply the Liptak combining function for synthetizing the information of the variable obtaining the National Index of Performance for each year from 1998 to 2010;

3. Calculation of the Index of Performance at provincial level and classification of provinces in four categories according to the value of the index. Quartiles of the distributions of the 31 provinces are used as threshold values;

4. Calculation of the Gini's Index of heterogeneity normalized with respect to the values of 1998;

5. Grouping of provinces according to their geographical location in 4 areas and maps elaboration;

6. Calculation of the Index of similarity among provinces.

3.2 DESCRIPTION OF DATASETS

The data used in this analysis were collected from China Statistical Yearbooks of several years from 1999 until 2011.

Two datasets have been used for this analysis. Data refer to both the national and the provincial administrative level. At national level the units of analysis are 13 (years, 1998-2013). At the provincial level the units of analysis are 31 (provinces) and the period considered goes from 1998 to 2010. In both datasets the variables considered are five for each year[5]:

- **Gross industrial output value** which is the total volume of final industrial products produced and industrial services provided during a given period in

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[5] In 2004 and 2006 two variables were missing at provincial level. Specifically, the variable Gross Industrial Output for 2004 and the variable employment for 2006 could not be found in the statistical yearbooks. Hence, the values for these variables in these two years were obtained through the interpolation of the values of the most adjacent years for each province.

monetary terms. It reflects the total achievements and overall scale of industrial production during a given period[6];

- **Exports** refer to the real value for each province of commodities exported across the border of China. They include the actual exports through foreign trade, exported goods under the processing and assembling trades and materials, exported commodities processed with imported materials, exported commodities and articles for public use of the Sino-foreign joint ventures, cooperative enterprises and ventures with sole foreign investment[7];

- **Density of enterprises** identifies the number of enterprises above designated size per square kilometer in each province;

- **Per capita GDP** refers to the value of the final products at market prices produced by each resident unit in the country (or province) during a certain period of time[8];

- **Employment** refers to persons aged 16 and over who are engaged in gainful employment and thus receive remuneration payment or earn business income. It includes all the persons working in government agencies of various levels, political and party organizations, social organizations, enterprises and institutions[9];

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[6] Definition taken from "Explanatory Notes on main statistical indicators" in China Statistical Yearbook (2011), chap. 14.
[7] Definition taken from "Explanatory Notes on main statistical indicators" in China Statistical Yearbook (2011), chap. 6.
[8] Definition taken from "Explanatory Notes on main statistical indicators" in China Statistical Yearbook (2011), chap. 2.
[9] Definition taken from "Explanatory Notes on main statistical indicators" in China Statistical Yearbook (2011), chap. 4.

3.3 INDEX OF PERFORMANCE AT NATIONAL LEVEL

The Index of Performance calculated using data at national level aims at providing a picture of the trend of the Chinese growth over the considered years.

In this case, the Index of Performance is calculated using Liptak's combining function. The choice of this function derives from the fact that in this case the units of analysis are years, rather than administrative units. Fisher's combining function rewards units that excel even only in one or few dimensions. Liptak's combining function is ideal in this case because the aim is not to reward units (in this case years) that excel only in one or few dimensions, but rather to obtain an indicator that shows good performances when all the variables take large values. Furthermore, Liptak's combining function does not assume a linear relationship between the composite index and the single variables, as other functions or statistical techniques do (e.g. principal component analysis, factor analysis, etc.).

Before proceeding with the calculation of the index, some tests for normality distribution were performed. Since the method is based on a non-parametric combination, it is usually not necessary to test for normality. Nevertheless, when normality is plausible the use of Liptak's combination is even more justifiable.

Thus, each variable has been tested with Shapiro-Wilk test (Shapiro & Wilk, 1965). At the significance level $\alpha=0.01$, the results (Table 3.1) show that for all the variables the hypothesis of normality cannot be rejected. These results are also confirmed by the normal probability plots (Figure 3.1).

Table 3.1. Results of the Shapiro-Wilk Test for Normal Data

SHAPIRO-WILK W TEST FOR NORMAL DATA			
Variable	**Observations**	**z**	**Prob>z**
Employment	13	0.445	0.32808
Export	13	1.327	0.09228
Per capita GDP	13	1.296	0.09740
Industrial Output	13	1.585	0.05646
Density of enterprises	13	1.847	0.03241

Source: Author's elaboration

Figure 3.1. Normal Probability plot for Performance variables (1998-2010)
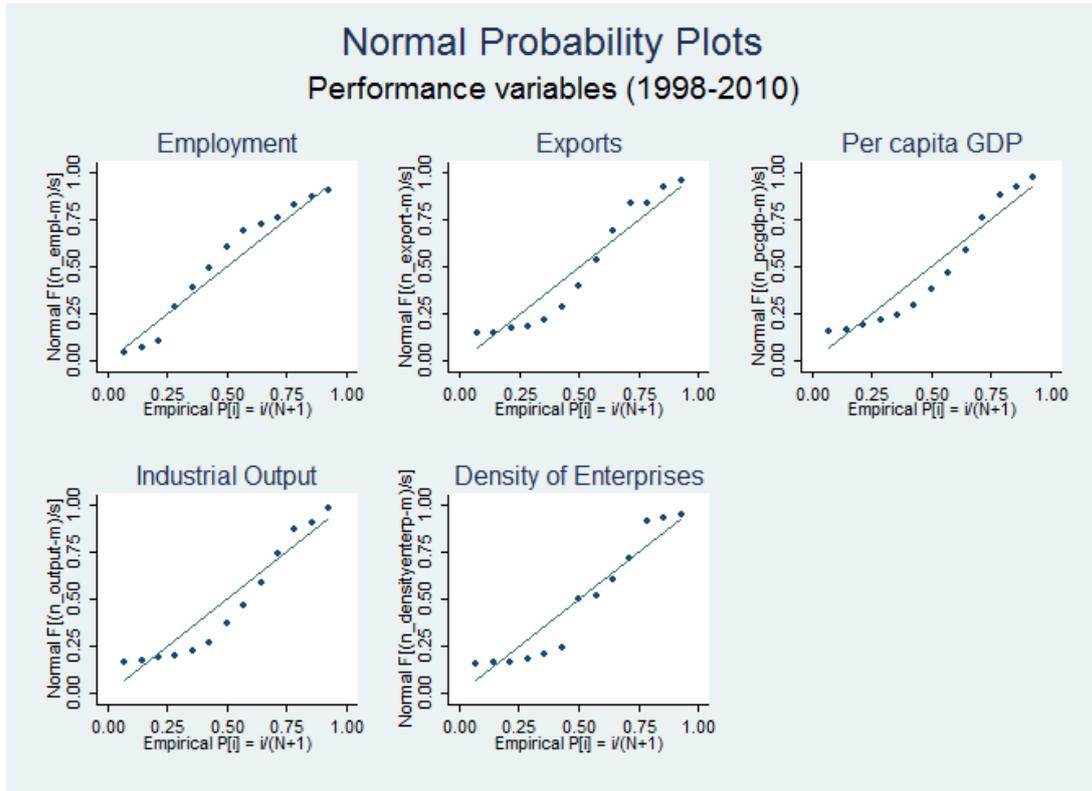
In order to create the Indices of Performance, it is firstly necessary to normalize the variables.

Variables are indicated as X_{vj} where:

v = variable (with $v = 1, ..., 5$)

j = year (with $j = 1, ...,13$)

Each variable was normalized according to the following rule with respect to years:

$$\lambda_{vj} = \frac{X_{vj} - min_j(X_{vj}) + \frac{1}{13}}{max_j(X_{vj}) - min_j(X_{vj}) + \frac{2}{13}}$$

where:

- λ_{vj} is the v-th normalized variable in the year j.
- X_{vj} is the v-th original variable in the year j.
- $min_j(X_{vj})$ and $max_j(X_{vj})$ are respectively the minimum and maximum values taken by the v-th variable in the year j.

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The result of the normalization is an indicator that takes values strictly included in the interval between 0 and 1. In order to avoid that the normalized variable takes the value 0 or 1, in the formula 1/13 and 2/13 were added to the numerator and denominator respectively because 13 is the number of observations (years) for each variable. In this way it is avoided the risk of getting forms of indeterminacy and infinite values that would have occurred in the case of numerators equal to zero or with the argument of the logarithmic function equal to zero $(\log(0) = \infty)$.

Once the variables were normalized with respect to years, it became possible to apply the combining function of Liptak which can be formalized as:

$$CHN\_IPerf_j = \sum_{v=1}^{5} w_v \Phi^{-1}(\lambda_{vj})$$

where:

- CHN_IPerf_j is the National Performance Index for the year j
- w_v is a weight (degree of importance) given to the v-th normalized variable. In this case it is assumed that each variable has equal weight, hence $w_v = 1/5$ for each v.
- Φ is the standard normal cumulative distribution function.

Liptak's combining function combines values between 0 (zero) and 1 and it returns values included in the line of Real numbers ($\mathbb{R}$). Low performances correspond to negative values, while high performances correspond to positive values. The interval of admissible values is (-∞, +∞).

The resulting National Indices of Performance have been plotted in the graph (Figure 3.2) in order to have a full picture of the national trend growth over the period 1998-2010.

The graph shows an increase in industrial performances over the years, thus confirming the main literature on the topic and providing the base for the following analysis on inequalities. Furthermore, in 2010 the value of the index almost doubles that of 1998.

China has constantly increased its industrial performances over the last decades. As already pointed out in the previous chapter, according to the main literature the massive growth has been mainly due to the great process of reform implemented by the Chinese government. Furthermore, policies were particularly addressed to the achievement of high standards of industrialization. Thus, attention was focused on the development of industry and, in particular, of specific strategic sectors. Policies left out other objectives such as the equal distribution of the benefits of industrial development. The deliberate strategy of testing policies in few areas before expanding them to the whole country has exacerbated unbalances. Consequently, the concern over the unbalanced distribution of industrialization has recently started to increase.

The following paragraphs are dedicated to the analysis of the uneven distribution of industrial performances.

Figure 3.2. China Index of Performance (1998-2010)
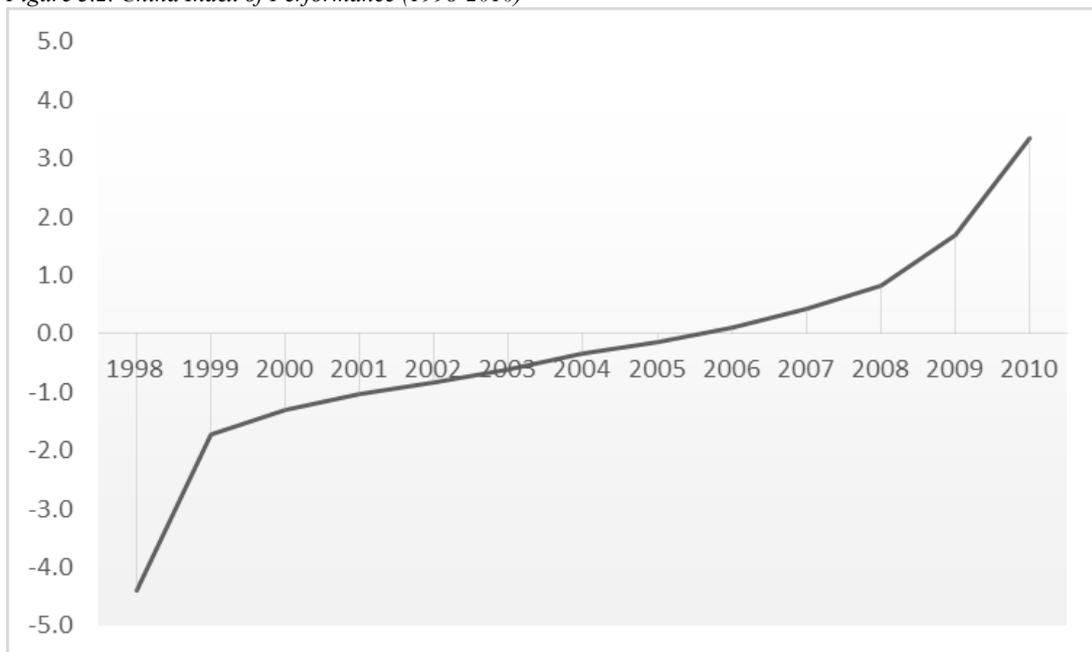
Source: Author's elaboration

Table 3.2. National Index of Performance (1998-2010)

	CHINA INDEX OF PERFORMANCE	CHINA INDEX OF PERFORMANCE NORMALIZED
1998	-4.3939	0.0098
1999	-1.7202	0.3488
2000	-1.3033	0.4017
2001	-1.0357	0.4356
2002	-0.8459	0.4597
2003	-0.6189	0.4885
2004	-0.3406	0.5237
2005	-0.1348	0.5498
2006	0.1050	0.5802
2007	0.4242	0.6207
2008	0.8134	0.6701
2009	1.6786	0.7798
2010	3.3382	0.9902

Source: Author's elaboration

3.4 INDEX OF PERFORMANCE AT PROVINCIAL LEVEL

One of the ways in which it is possible to assess unbalances in the distribution of economic performances is to look at the provincial data.

Before proceeding with the calculation of the Provincial Index of Performance (*ProvIPerf*) variables have been first carefully identified and selected for the years 1998-2010. They were fully described in the paragraph 3.2.

Firstly, the variables need to be normalized. Variables are indicated with Y_{vpj} where:

v = variable (with $v = 1, ... ,5$)

p = province (with $c = 1, ... ,31$)

j = year (with $j = 1, ... , 13$)

1.   Each of the variables was normalized according to the following rule:

$$\gamma_{vpj} = \frac{Y_{vpj} - \min_p(Y_{vpj}) + \frac{1}{31}}{\max_p(Y_{vpj}) - \min_p(X_{vpj}) + \frac{2}{31}}$$

where:

- γ_{vpj} is the normalized variable v in the province p in the year j.

- Y_{vpj} is the variable v in the province p in the year j.

- $\min_p(Y_{vpj})$ and $\max_p(Y_{vpj})$ are respectively the minimum and maximum values taken by the variable v in the province p in the year j.

Once this step was completed, the Provincial Index of Performance was calculated. The preselected variables were combined using Fisher's combining function:

$$ProvIPerf_{pj} = -\sum_{v=1}^{k} w_v \ln(1 - \gamma_{vpj})$$

where:

- $ProvIPerf_{pj}$ is the Provincial Index of Performance in the province p in the year j.

- γ_{vpj} is the normalized variable v in the province p in the year j.

- $_Y w_v$ indicates the weight that is given to each variable. It is assumed that each variable has equal weight.

2. Once *ProvIPerf* was calculated, it has been normalized, in order to obtain for each county/district a value between 0 and 1 (excluded):

$$\gamma'_{pj} = \frac{ProvIPerf_{pj} - \min_p(ProvIPerf_{pj}) + \frac{1}{31}}{\max_p(ProvIPerf_{pj}) - \min_p(ProvIPerf_{pj}) + \frac{2}{31}}$$

where:

- γ'_{pj} is the normalized value of the Provincial Index of Performance in the province p in the year j.

- $ProvIPerf_{pj}$ is the Provincial Index of Performance in the province p in the year j.

- $min_p(ProvIPerf_{pj})$ and $\max_p(ProvIPerf_{pj})$ are respectively the minimum and maximum values taken by the Index in the province p in the year j.

An index very close to one indicates a high intensity of performance for a given county/district with respect to all the others; while if the index value is very close to 0, this means that the intensity of the performance is low.

The use of Indices in this analysis brings some advantages that can be summarized as:

- They are the synthesis of multivariate information,
- The normalization facilitates the interpretation of the results,
- They are non-parametric, thus their calculation do not require the assumptions of linearity and normality,
- They are robust and flexible,
- Their calculation is possible even in case of multivariate mixed variables (specifically, in the case of categorical and/or numerical variables),
- Fisher's transformation, due to the logarithmic transformation, rewards counties that excel even in only one variable
- This method allows to give different weights (w_v) to the variables of interest.

3.5 GINI'S INDEX OF HETEROGENEITY

Once the Provincial Index of Performance were calculated the observations have been divided in classes (A = low performance; B = medium-low performances; C = medium-high performance; D = high performance) with respect to quartiles of the index of performance of 1998.

In order to assess how performances have involved the national territory over time the normalized Gini's index of heterogeneity was calculated. The formula used can be formalized as:

$$ProvHetI_j = \frac{\sum_{k=1}^{4}(\frac{f_{kj}}{n})(1 - \frac{f_{kj}}{n})}{3/4}$$

where:

- $ProvHetI_j$ is the normalized Gini's Heterogeneity Index in the year j.
- k are the categories in which the performances of provinces have been divided and classified as A, B, C, D.
- $\frac{f_{kj}}{n}$ is the relative frequency, hence the number of provinces classified as k in the year j divided by the number of observations n.
- 3/4 is the case of maximum heterogeneity of the Gini's Index.

Once the index of heterogeneity for each year was calculated, it was normalized with respect to 1998 (which is the first year considered in the analysis) according to the following formula:

$$NormProvHetI_j = \frac{ProvHetI_j}{ProvHetI_1}$$

where

- $NormProvHetI_j$ is the normalized value of the Gini's Index of Heterogeneity in the year j;
- $ProvHetI_j$ is the value of the Gini's Index of Heterogeneity in the year j;
- $ProvHetI_1$ is the value of the Gini's Index of Heterogeneity in 1998 which is the first year of the dataset.

The indices plotted show a slight decrease in heterogeneity over time since 1998 (Figure 3.3). Thus, China is slowly going in the direction of performances distributed homogeneously over the territory.

At this point of the analysis, the yearly considered indices do not measure an absolute heterogeneity because, by construction[10], the heterogeneity in 1998 is maximum and in the following years it is relative to that of 1998. This graph only aims at showing a trend in the distribution of performances in China. Nonetheless, it is possible to state that since 1978 heterogeneity in China has been at its highest levels and the situation seems to have remained unchanged over the years despite the heavy industrialization (Fan, 1995; Kanbur & Zhang, 1999; Wang, 2007; Fan & Sun, 2008; Fan et al., 2009; Barone et al., 2013).

Figure 3.3. Gini's Index of heterogeneity normalized with respect to 1998
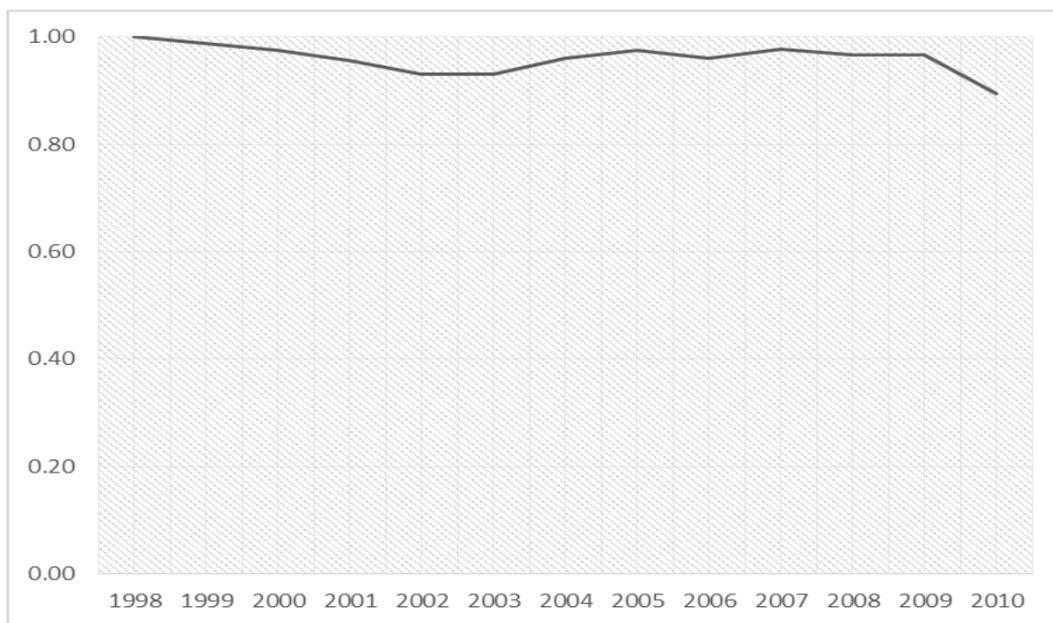
Thus, now it is clear how heterogeneity has changed over time, but yet the extent of heterogeneity is unknown. At this stage of the analysis the aim is to assess the trend of heterogeneity understanding if it increases or decreases with respect to 1998.

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[10] The use of quartiles as threshold values in 1998 generates maximally heterogeneous groups.

3.6 GEOGRAPHICAL DISTRIBUTION OF PERFORMANCES

At this point of the analysis the 31 provinces have been divided into four groups according to geographic characteristics: Eastern Coastal (10 provinces), Northern East (7) Western (7) Central (7)[11]. The elaboration of maps gives the possibility to show the distribution of the indices of performances in each area and for each year.

The level of performance in each area seems to stay approximately unchanged for the whole period considered. In particular, the coastal area has most of its provinces in the highest category of performances while western area has the lowest level.

Figure 3.4. Geographical distribution of performances in 1998
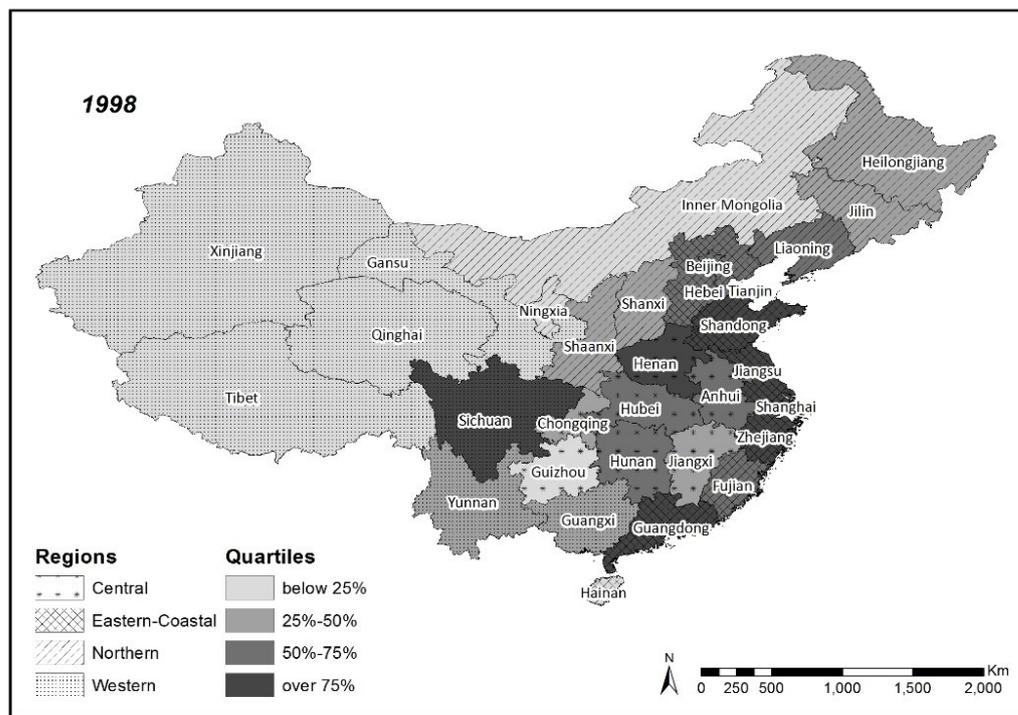
Source: Author's elaboration

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[11] The provinces included in the Eastern Coastal region are: Beijing, Tianjin, Hebei Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan; the Central area includes: Anhui, Jiangxi, Henan, Hubei, Hunan, Guizhou, Chongqing; the provinces included in the Northern area are: Liaoning, Jilin, Heilongjiang, Inner Mongolia, Ningxia, Shaanxi, Shanxi; Western provinces are: Guangxi, Yunnan, Sichuan, Tibet, Gansu, Qinghai, Xinjiang.

Figure 3.5. Geographical distribution of performances in 1999
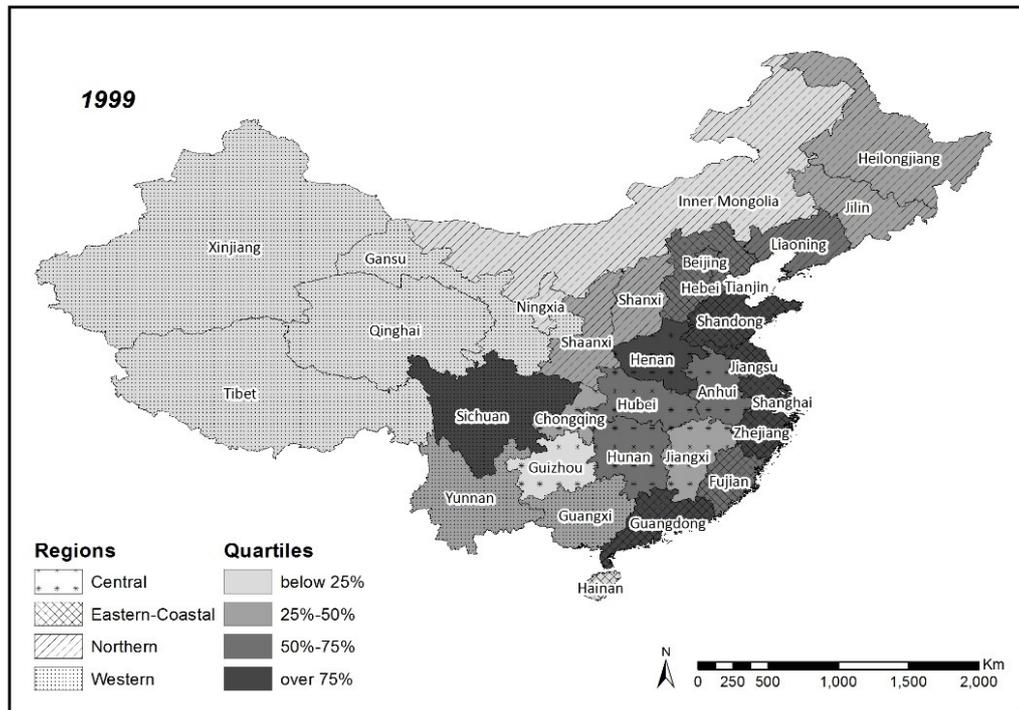
Source: Author's elaboration

Figure 3.6. Geographical distribution of performances in 2000
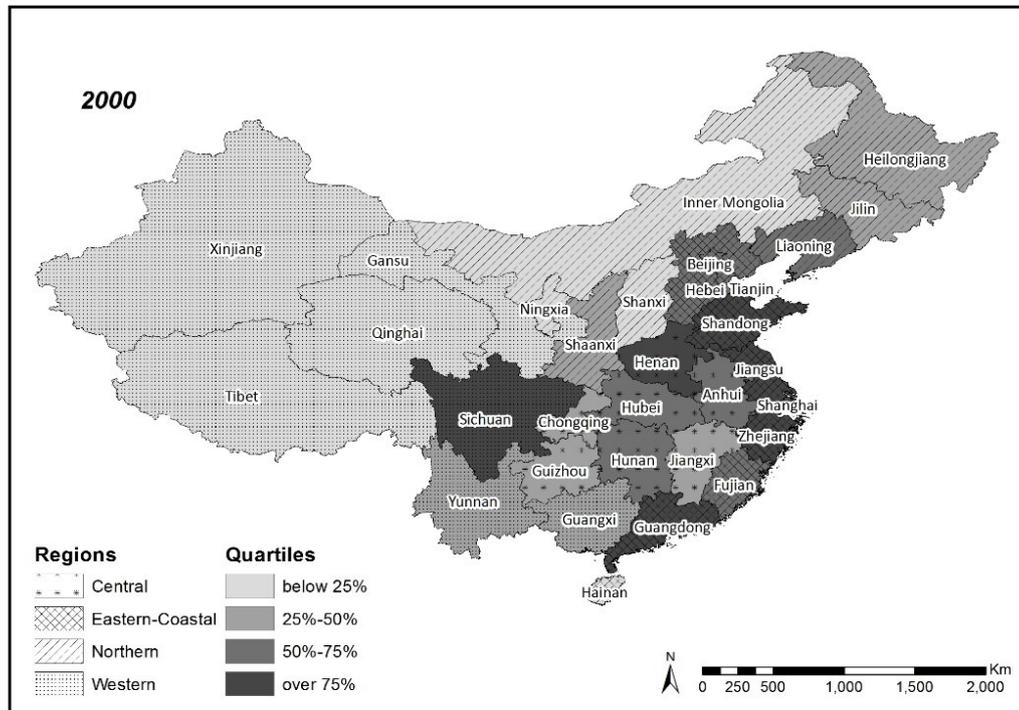
Source: Author's elaboration

Figure 3.7. Geographical distribution of performances in 2001
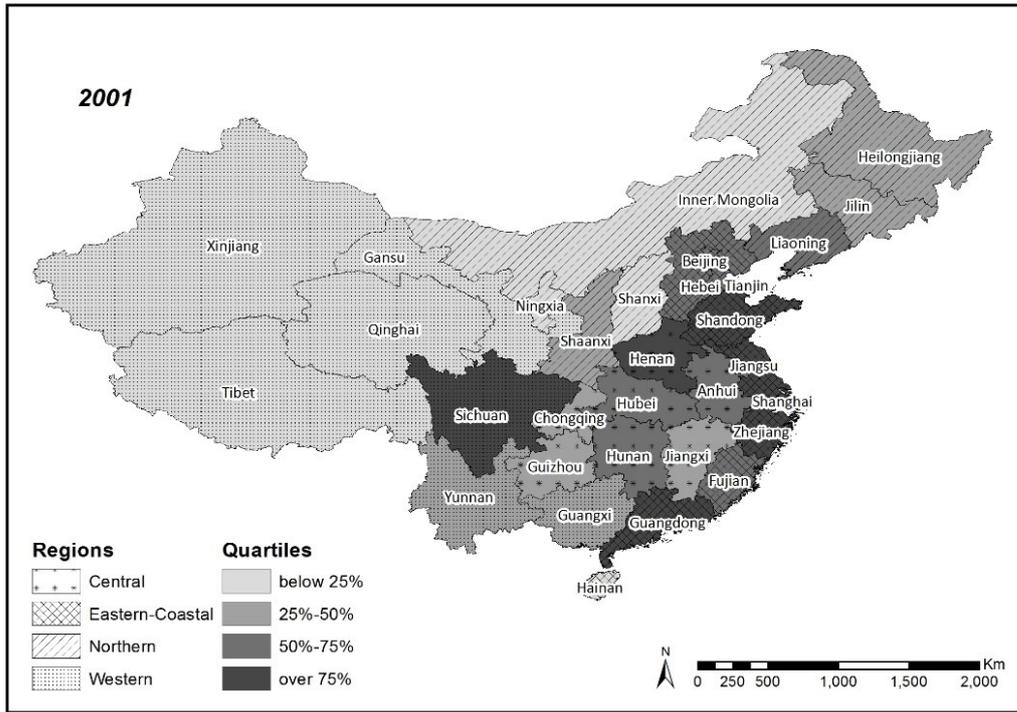
Source: Author's elaboration

Figure 3.8. Geographical distribution of performances in 2002

Source: Author's elaboration

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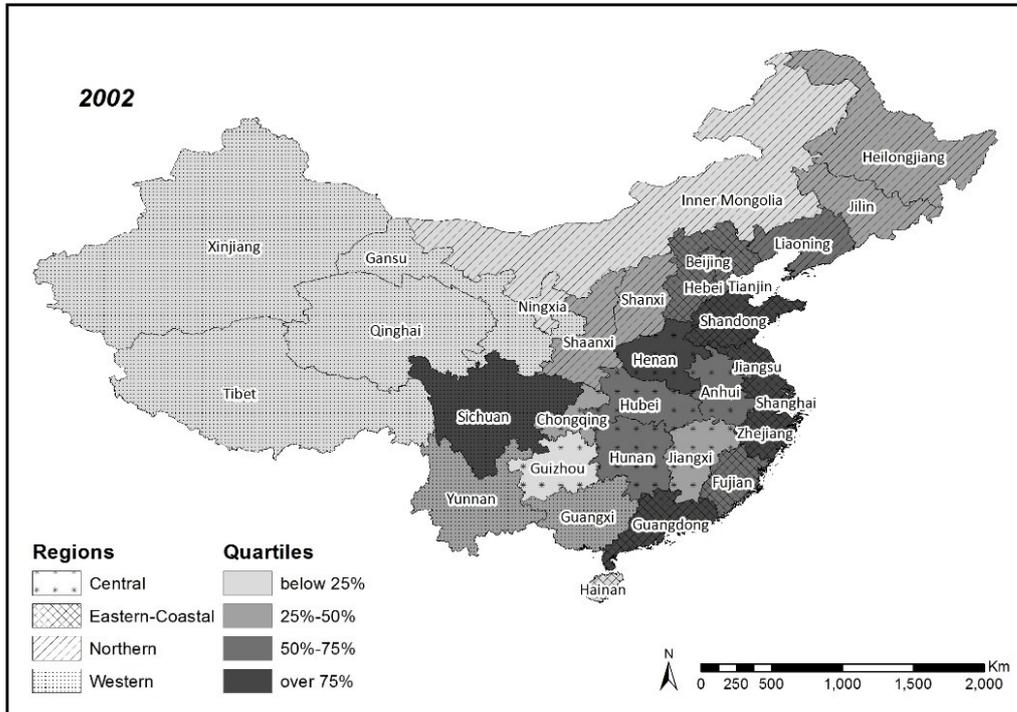
Figure 3.9. Geographical distribution of performances in 2003
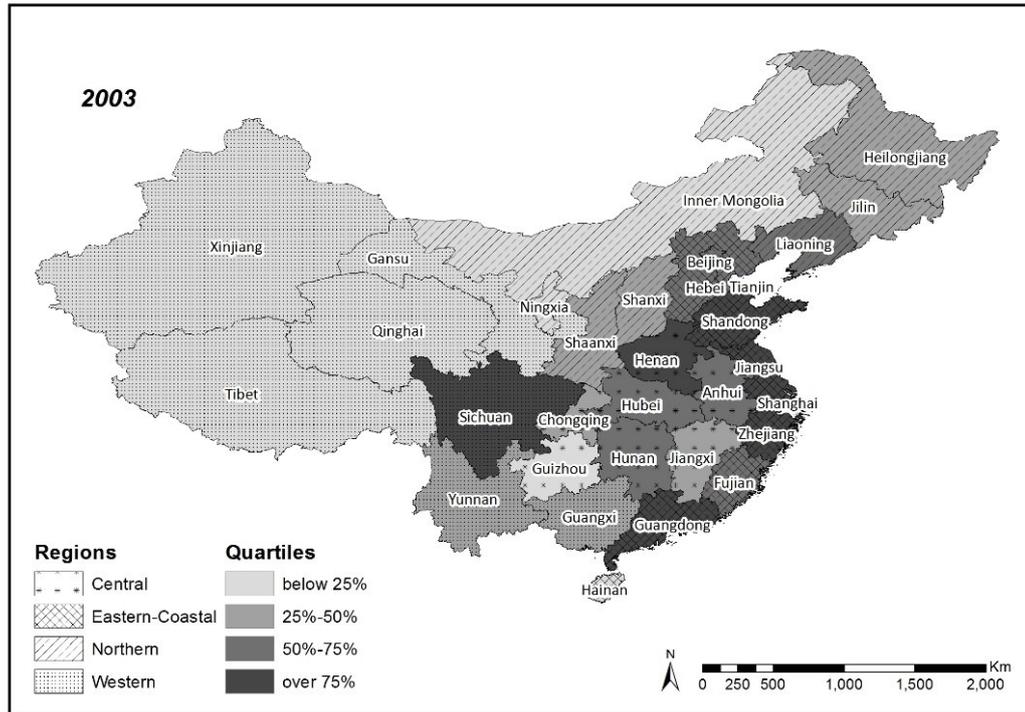
Source: Author's elaboration

Figure 3.10. Geographical distribution of performances in 2004
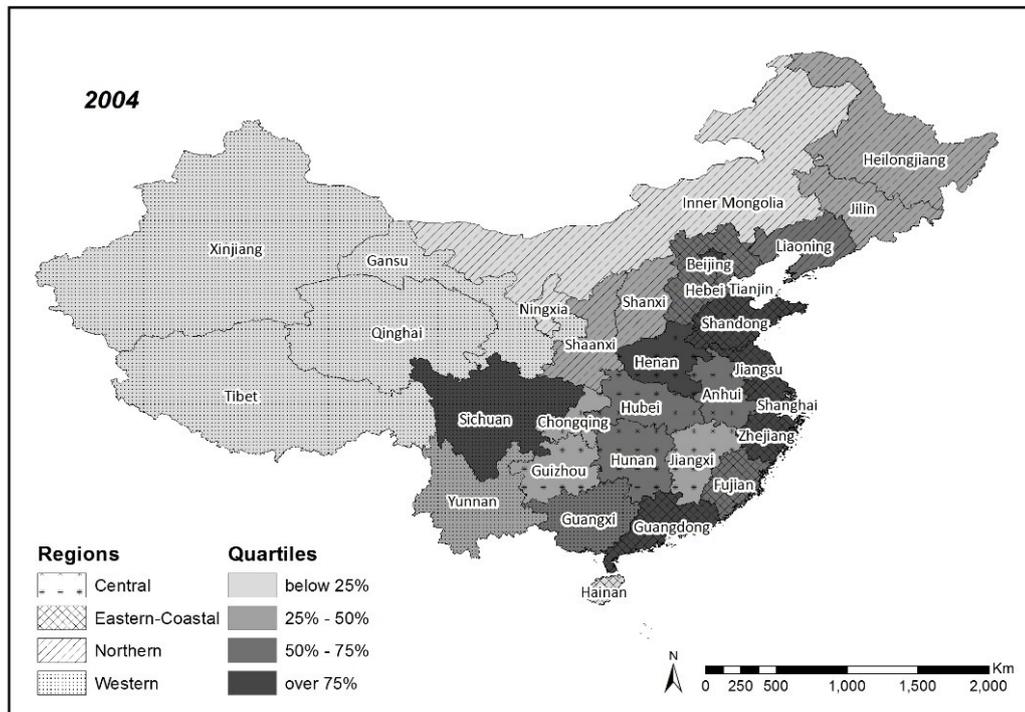
Source: Author's elaboration

Figure 3.11. Geographical distribution of performances in 2005
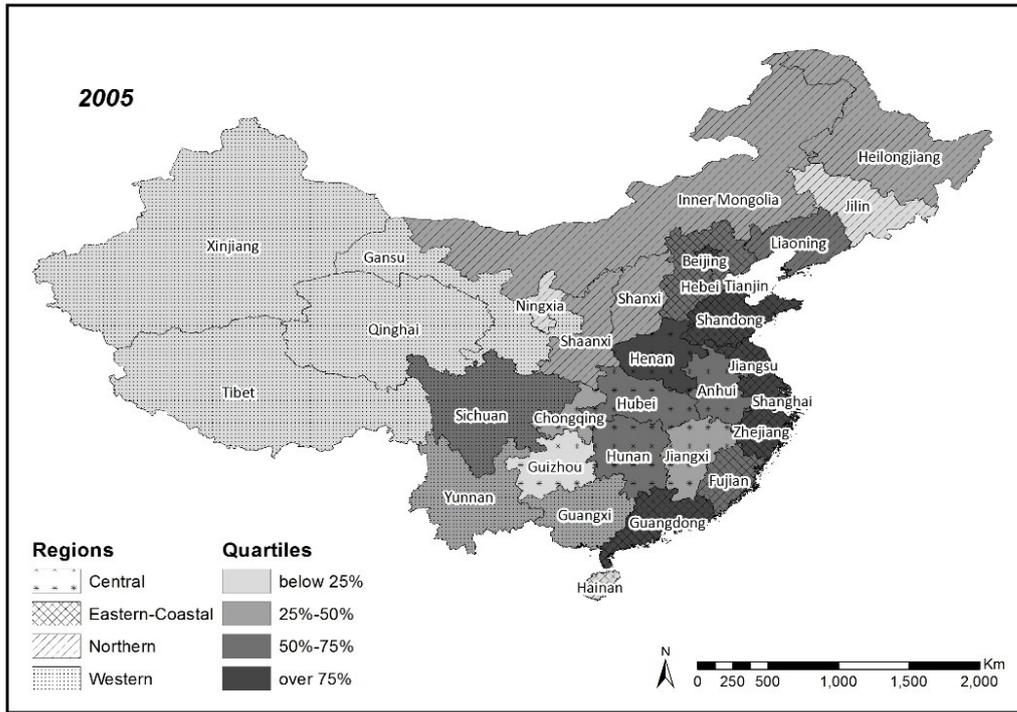
Source: Author's elaboration

Figure 3.12. Geographical distribution of performances in 2006
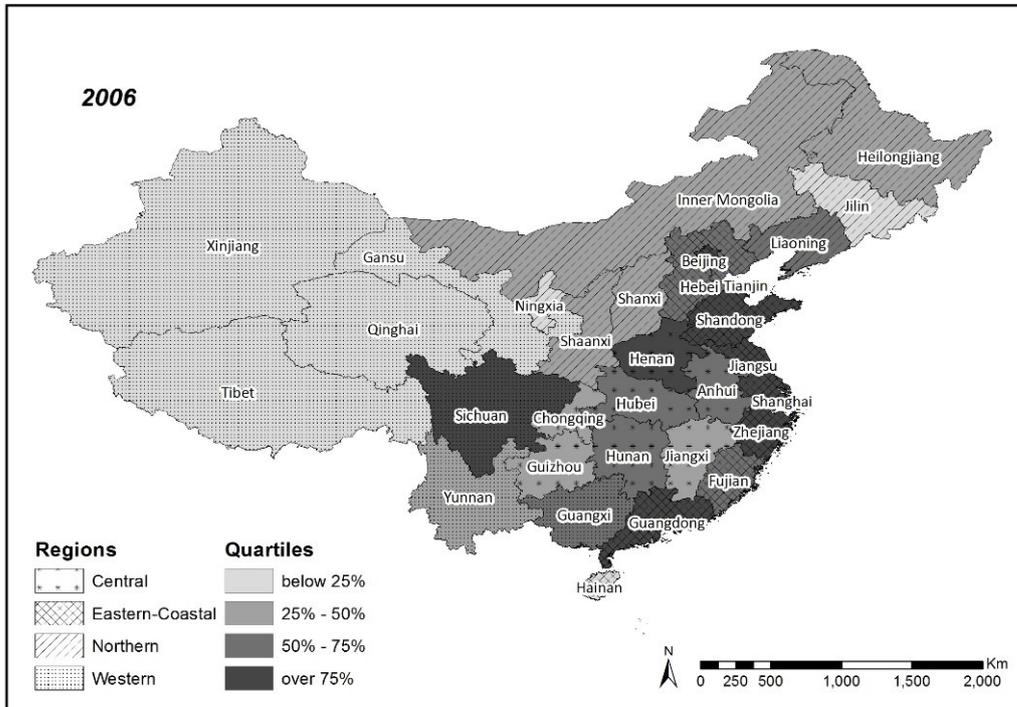
Source: Author's elaboration

Figure 3.13. Geographical distribution of performances in 2007
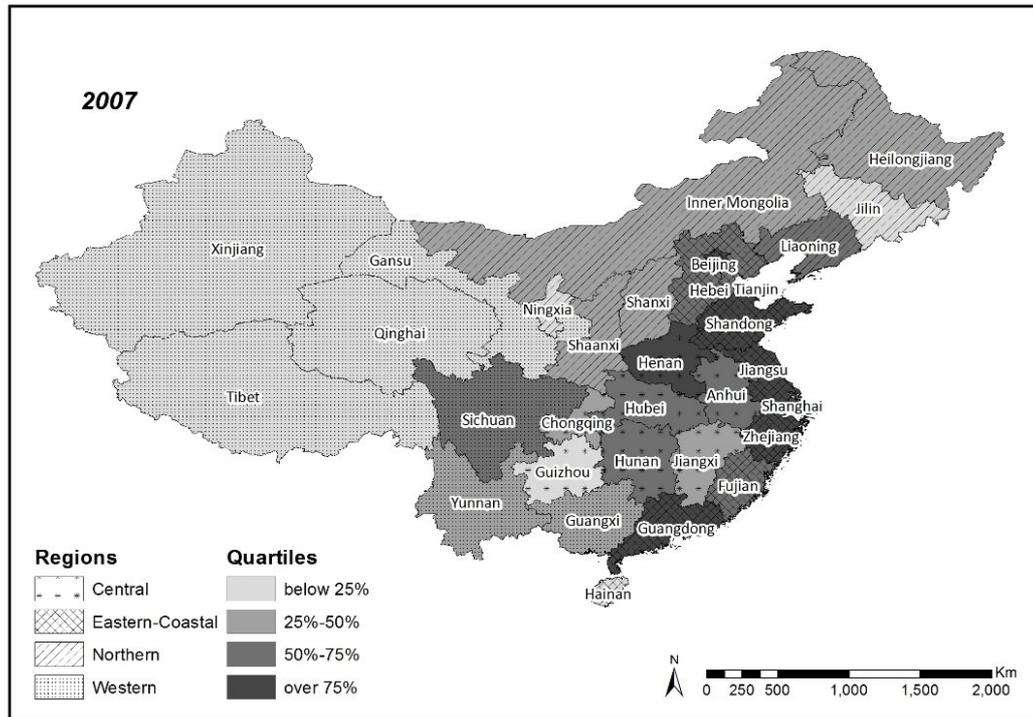
Source: Author's elaboration

Figure 3.14. Geographical distribution of performances in 2008
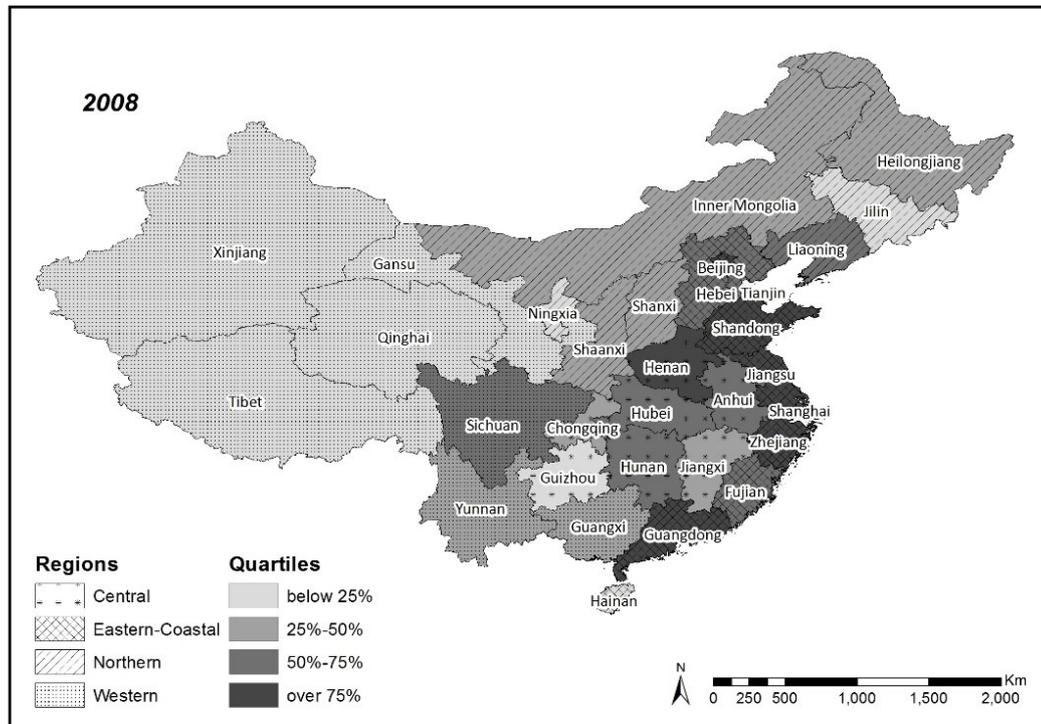
Source: Author's elaboration

Figure 3.15. Geographical distribution of performances in 2009
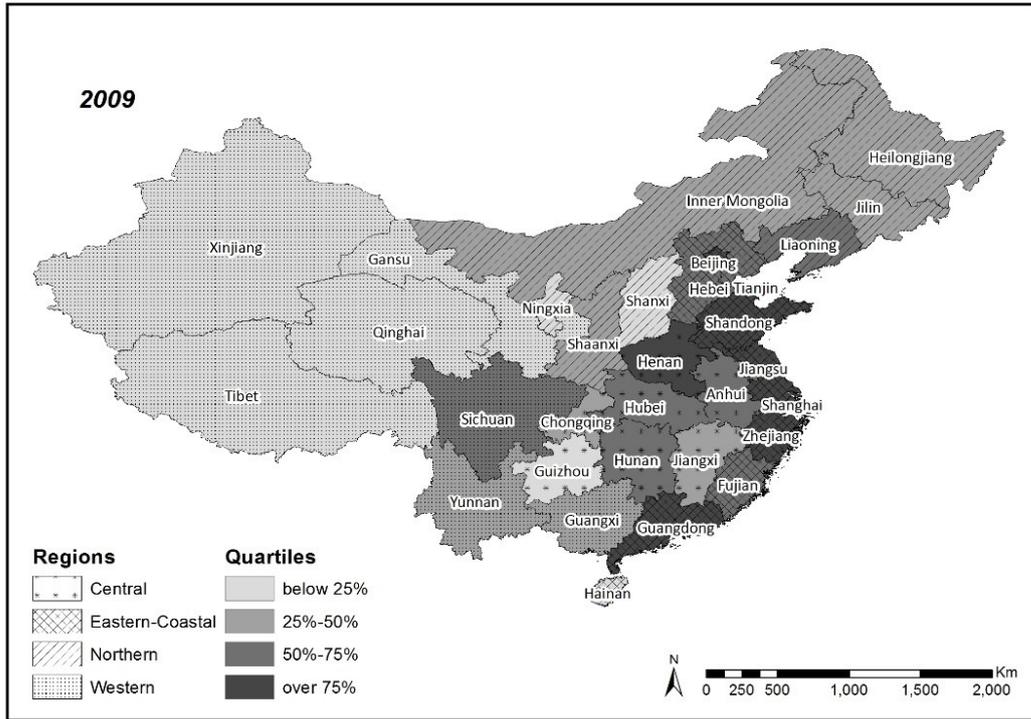
Source: Author's elaboration

Figure 3.16. Geographical distribution of performances in 2010
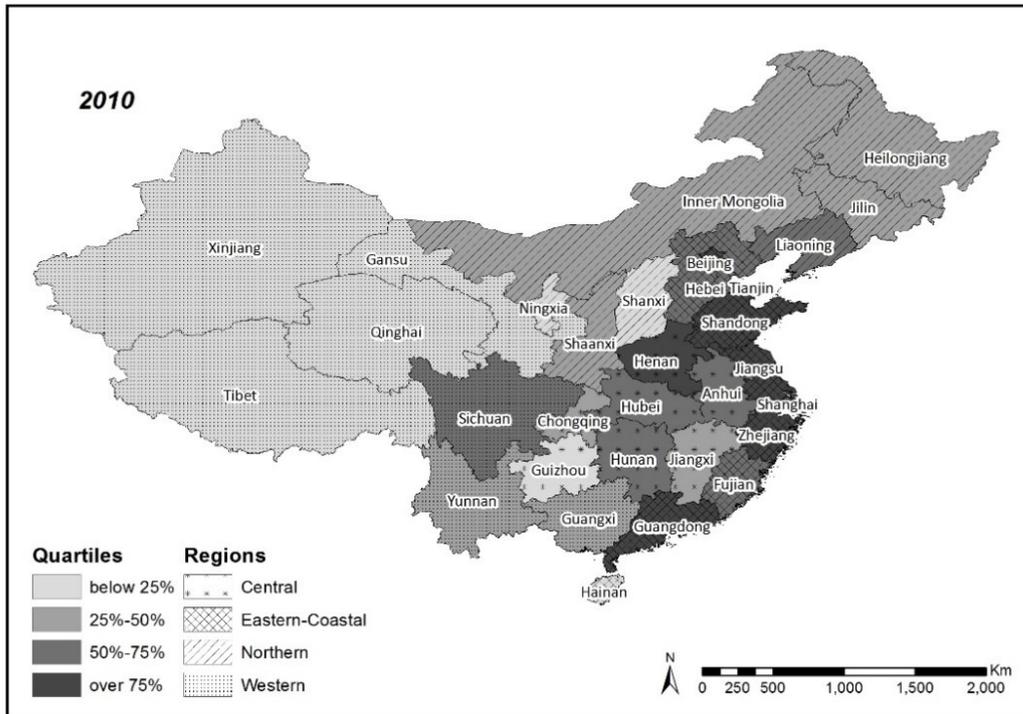
Source: Author's elaboration

This descriptive analysis given by the maps does not fully describe inequalities on the Chinese territory for the period 1998-2010. It is necessary to conduct further analysis aimed at showing the unbalances among areas taking into account the level of performance. This analysis should take into account the findings reached so far: growing performances and a slowly decreasing heterogeneity in China over time. Maps show that economic performances seem to be higher in the coastal area and lower in the inner provinces.

Nonetheless, in this phase it is not clear how provinces differ from each other in terms of economic performances and how performances distribute in each area (Western-Coastal, Central, Northern, Western areas).

The values of the Provincial Indices of Performance for each year from 1998 to 2010 have been plotted in the graph (Figure 3.17) in order to show trends and dispersion in distribution.

Figure 3.17. Dot-plot of Index of Performance at provincial level by year
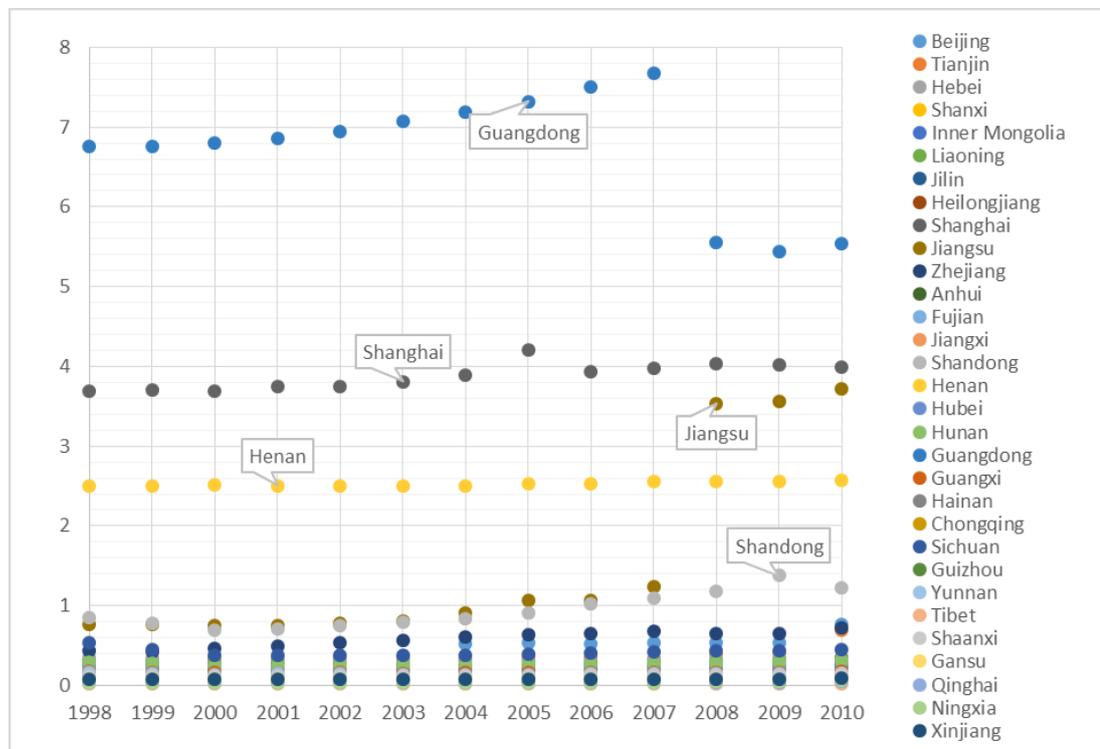
Source: Author's elaboration

The dot-plot shows a great concentration of provinces with very low performances. Most of the dots are in fact concentrated in the lowest part of the chart. Thus, most of the provinces show low performances for the entire period considered.

Furthermore, there does not seem to be a great mobility from lower to upper level. Only in recent years, though, there seem to be a growing trend in performances for a few provinces (namely Shandong and Jiangsu). Guangdong province is the province that holds for the entire period the highest level of performance. However, from 2008 its performances have consistently decreased. On the contrary, Xinjiang has the lowest performance for the whole period. Shanghai and Henan are included in the top-five provinces in terms of performances. They show high level of economic performances for the whole period.

The graph in Figure 3.18 shows the persistence of each province in the same category of performance for the whole period 1998-2010. It was obtained calculating the Gini index of heterogeneity for each province with respect to years. A value of the index equal to zero indicates a persistency in the same category for the entire period.

The result is that most of the provinces remain in the same category for the whole period. Thus, they do not improve (or worsen) their level of performance. Only a few provinces seem to change category during the period considered. Tianjin and Sichuan show a low value of the index which nonetheless might indicate a change of category only for a short time.

These findings confirm the hypothesis of provinces that have experienced different degrees of growth. Furthermore, provinces do no to seem to have substantially changed their situation in a positive or negative way. Provinces have showed the same level of performances for the entire period without improvements in economic performances.

The resulting picture gives the idea of a territory marked by unbalances that have remained unchanged for the whole period.

In the last phase of the analysis, the idea is to show that, not only the mobility of provinces from one category to the other is practically null, but also that the

differences among the four areas indicated by the literature seem to persist for the decade 1998-2010.

Figure 3.18. Persistence of provinces in the same category for the whole period 1998-2010
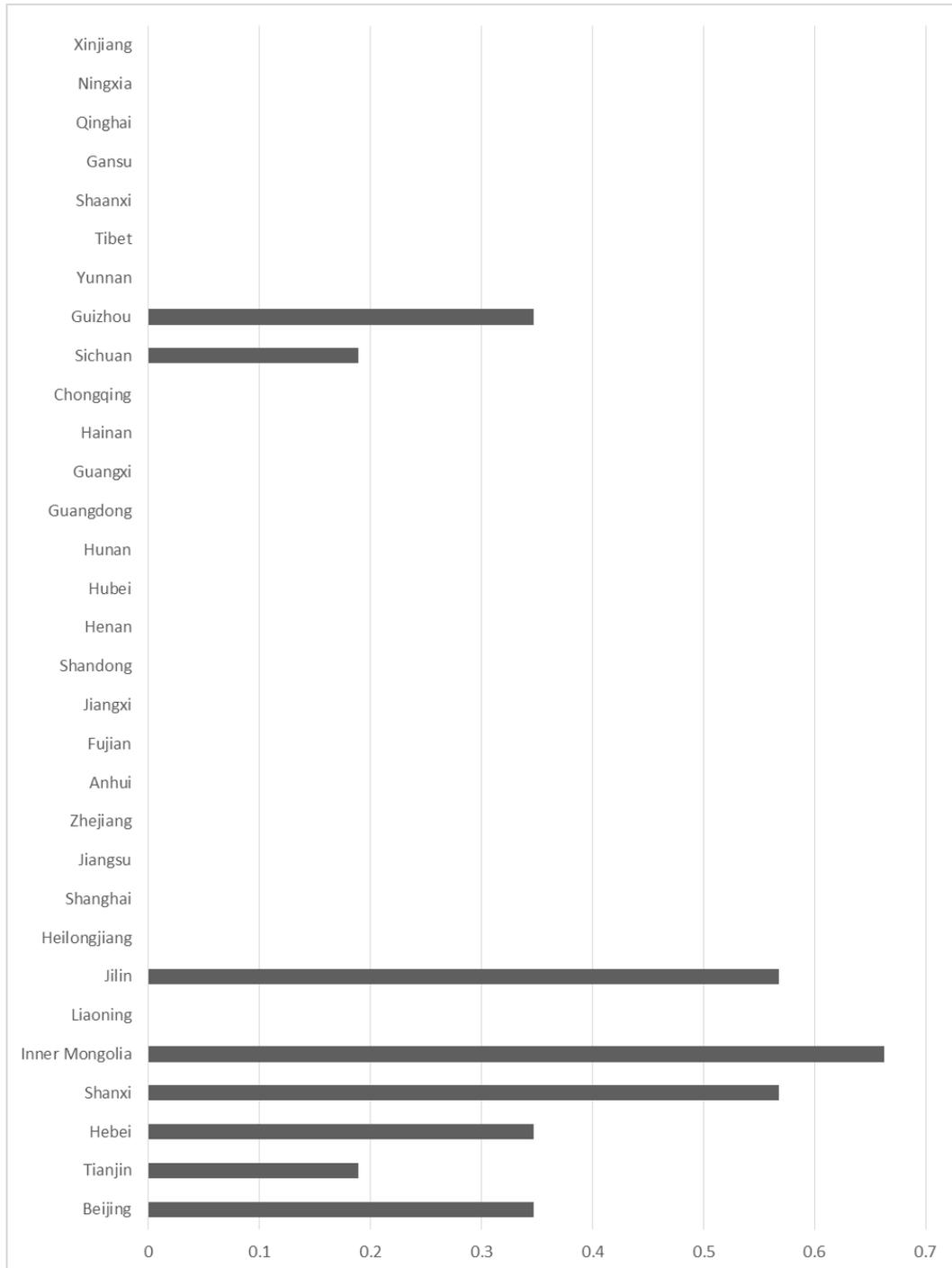
Source: Author's elaboration

3.7 INDICES OF SIMILARITY AMONG PROVINCES

As a last phase of the analysis, the aim in this paragraph is to assess the existence of four areas in China, that in the last decade have experienced different levels of performances. Furthermore, the idea is to show that these areas have remained different in terms of distribution of performances for the entire period.

In order to compare distributions among areas, multi-sample permutation tests are performed. The resulting p-values are used as Index of Similarity that show how much the distributions of the categories of performance (A, B, C, and D) in each area are similar.

It can be formalized as:

IS_j = p-value of the multivariate test for performance comparisons, where

$$H_0: ProvIPerf_{Cj} \overset{d}{=} ProvIPerf_{ECj} \overset{d}{=} ProvIPerf_{Nj} \overset{d}{=} ProvIPerf_{Wj}$$

and

$H_1: H_0$ is not true.

IS_j is the Index of Similarity in the year j and $ProvIPerf$ is the Provincial Index of Performance in the year j in the areas named Central (C), Eastern Coastal (EC), North (N), and Western (W).

The p-values do not show similarities among areas in terms of distribution of performances. The values of the Indices of Similarity are all below 0.018, thus below the level of significance $\alpha=0.10$.

This result can be interpreted as a lack of substantial similarities among areas. Thus, China shows to have great differences in terms of performances that persist without changes in the period 1998-2010. Chinese territories are different from each other and performances are not similarly distributed.

This situation does not seem to change over time and differences seem to persist for the whole period. The distribution of performances is still heavily different among the areas considered.

Only in 2006, a little change in the Index of Similarity goes in the direction of decreasing differences among territories.

These results complete the framework of the analysis of territorial unbalances in China.

Figure 3.19. Index of Similarity among areas
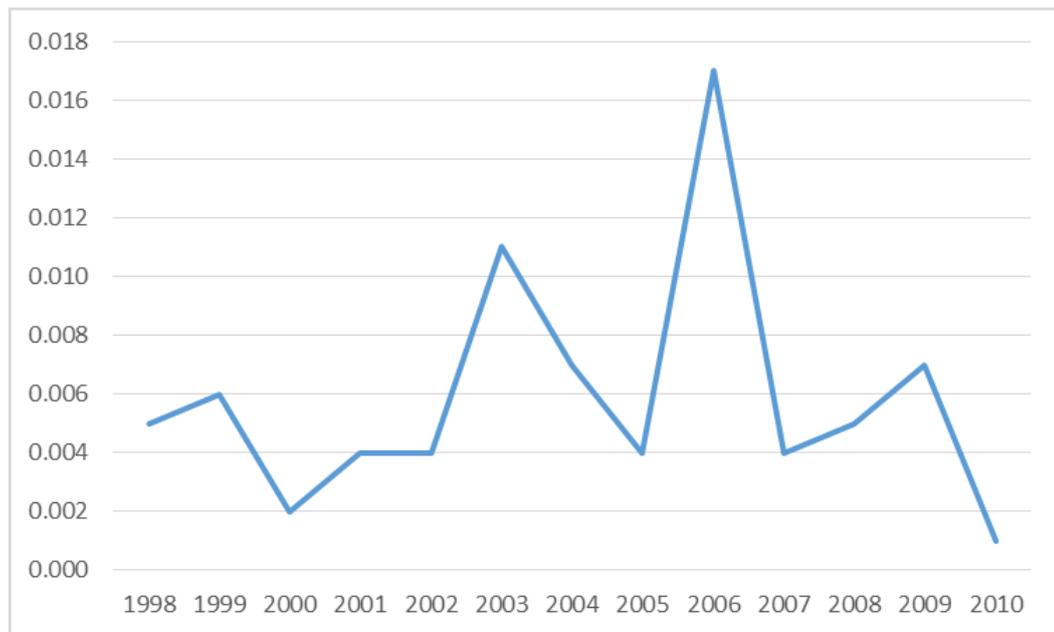
3.8 FINAL REMARKS

This chapter has highlighted the structure of distribution of economic performances in China.

Considered the massive industrialization that China has experienced in the last three decades, the aim here was to analyze the distribution of economic performances. What emerged from the analysis is that China has actually had a great economic growth in the period considered (1998-2010). Nevertheless, this growth has been accompanied by inequalities among Chinese provinces that have persisted almost unchanged for the whole period. In the period 1998-2010, a little decrease in heterogeneity has been observed especially until 2002 and from 2009.

Furthermore, from the analysis it emerged that most of the provinces have low performances for the whole period. Only few of them have experienced high levels of industrial performances and Guangdong province, in particular, is the province with the highest level of performances for the entire period.

Finally, the groups of provinces, compared to each other, do not show similarities in terms of distribution, thus confirming the hypothesis of four areas that grow at different speeds.

In short, the analysis confirms a massive increase in economic performances in China in the last decade. Nonetheless, signs of great inequalities that persist over time have been observed. The following chapter will focus attention on the province that has showed the highest index of industrial performances for the entire period. The idea is to continue the analysis on inequalities considering the case of the best performing province in terms of industrial growth in China, Guangdong, and assess its internal territorial unbalances.

PART II
Industrialization and Unbalances in China: the case of Guangdong Province

4 DEVELOPMENT PROCESS AND POLICIES IN GUANGDONG

4.1 INTRODUCTION

Guangdong province is located in the south-eastern part of China (Figure 4.1), close to Hong Kong and Macao, the two special administrative regions (SARs), respectively controlled by the United Kingdom (up until 1997), and by Portugal (up until 1999). It borders Guangxi province to the west, Hunan, Jiangxi and Fujian provinces to the east, and the South Sea of China to the south. Up until 1988, Hainan was also part of Guangdong province, then becoming an independent province.

The particular geographic location of Guangdong has represented one of the main reasons driving the central government's decision to choose the province as one of the first locations for experimentation of policies for the market economy. The proximity to Hong Kong and Macao, which represented two pillars of Western capitalism, has over the years favored diffusion throughout the whole province of a widespread entrepreneurial spirit and of knowhow coming from 'the West' (Di Tommaso, Rubini & Barbieri, 2013).

With a total area of 177,901 square kilometers, Guangdong province represents 1.87% of the entire People's Republic of China (PRC) and 60% of its territory is mountainous (Huikang, 2002; Liang et al., 2008).

Guangdong has four administrative levels (for which it is possible to obtain official statistics): the province level, the prefecture level, the county level, and the municipality level. The province is divided into 21 prefectures which in turn are divided into counties and districts (88 counties and districts in total). Out of the 21

Guangdong prefectures, 19 also have a third administrative level and are further divided into 23 city-counties, 41 counties, 3 autonomous counties and 54 districts (see table in the Appendix). The remaining two prefectures, Dongguan and Zhongshan, have a different structure since they have no county-level division. The most developed part of Guangdong is the central area, the so-called Pearl River Delta (PRD).

Figure 4.1. Guangdong location

Source: Author's elaboration
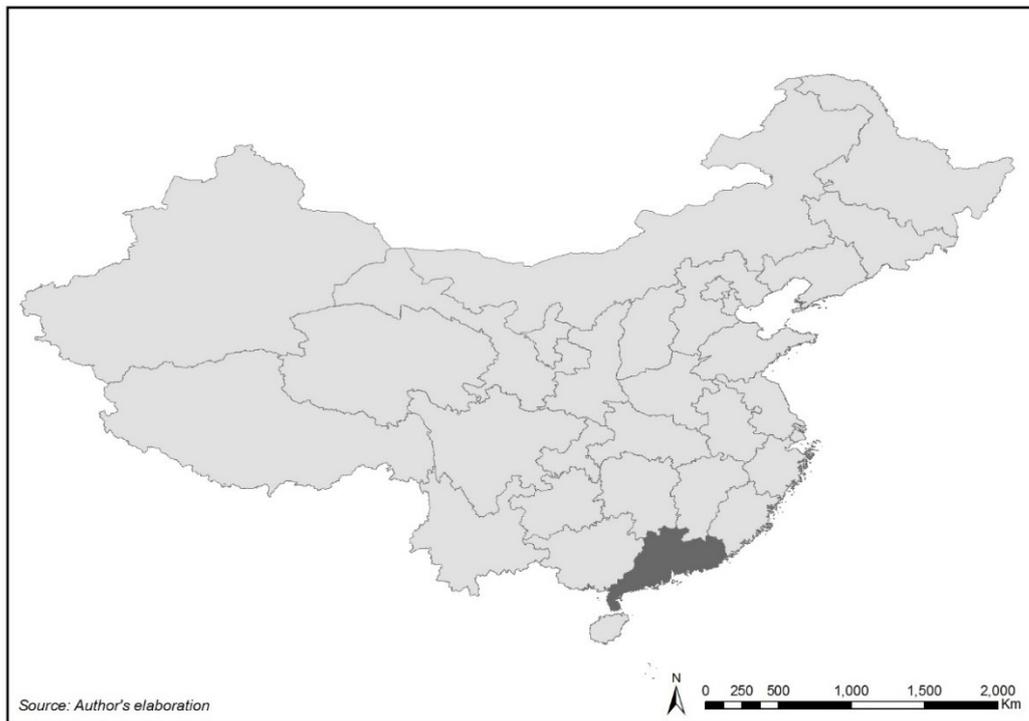
Until the reform of 1978, Guangdong's economy had a very high level of government centralization. Such a system had been successful during the first years of the People's Republic of China (PRC) because it allowed the government to concentrate its resources in particular areas in order to overcome the lack of investments and savings that characterized the country's economy. In the early years after the founding of the PRC the country enjoyed a brief period of rapid growth which was followed by another around the 1960s, when the growth rates declined.

The province of Guangdong had a period of remarkable growth after the First Five-Year Plan (1953-1957) during which the central government imposed a socialist economy trying to solve the confusion that dominated the entire nation during the early years following the founding of the Republic. In these period great importance

was given to agriculture and light industry. This was due to the tropical climate particularly favorable for certain types of crops and the particular closeness to Hong Kong and Macao. Heavy industry also showed signs of significant growth mainly due to mining sector.

In 1958-1962 the Second Five-Year Plan was introduced and Guangdong's economy suffered a setback mainly due to the policy of the "big push". This caused a reduction of consumption which was offset by a boost in investments especially in heavy industry (mainly in steel industry). As a result, the production in the light industry sector slowed down, inflation increased, and the economy of Guangdong suffered greatly.

In subsequent years (1963-1965), the central government tried to repair the failures of previous years through measures aimed at recovering agricultural production, stabilizing the prices of consumer goods, and restoring the balance between the branches of industry while reducing of importance the heavy industry. Soon, the focus went back to heavy industry following the introduction of the Third (1966-1970) and Fourth Five-Year Plans (1971-1975) (Yeung & Chu, 1998). These plans were intended to control consumption and give a slight boost to agricultural production and light industry but did not take into account the actual demand for such goods. Moreover these plans increased investments in heavy industry while a much smaller amount was assigned to light industry and agriculture. Once again, the economic growth of Guangdong suffered a setback.

Therefore, prior to 1978, Guangdong's economy had a remarkable growth especially in the first years after the founding of the PRC. In particular, agriculture and light industry sector lead the province's economy. The policy choices made later, however, favored heavy industry at the expense of other sectors of the economy and caused the setback. In the long run, economic performances of Guangdong were below its real potential because of the fear of the central government that the geographical location of the province could favor military invasions from enemies.

Starting from 1978, a new era began for the economy of Guangdong and the whole of China. In December of that year, Deng Xiaoping returned to the political scenario of China. He encouraged reforms, particularly in some areas of China in order to recover from the economic stagnation and promoted the development of the provinces of Guangdong and Fujian in order to create a favorable environment for trade relations with neighboring Hong Kong, Taiwan, and Macao. The central government then instituted a series of reforms and a new policy of openness. With regard to Guangdong, Deng Xiaoping redefined the relationship of the province with the central government, giving greater autonomy to the province in the main economic fields: the definition of plans for socio-economic development, the approval of foreign investment projects and the creation of Special Economic Zones (SEZ) in Shenzhen, Zhuhai and Shantou, privileges and autonomy in the financial sector, the establishment of financial companies and more privacy on international loans, autonomy in managing the level of prices of local products (Cheung P. T., 1998).

The market economy in some areas of the economy was replaced by planned economy (a few years after the reform, most prices in China were determined by the market). Guangdong initially, was given ample space to promote growth of light industry with a focus on textiles, electronics, toys and footwear. Soon Guangdong's economy shifted from agricultural to highly industrialized (Maruya T., 1998).

The proximity to Hong Kong contributed to the success of Guangdong in the years following the reforms of 1978. The proximity benefit was not only territorial but also cultural and linguistic. For centuries Hong Kong represented for Guangdong and for the whole China a route to the rest of the world. Hong Kong presented for foreign firms a strong incentive to establish their businesses in Guangdong and Hong Kong companies themselves believed it advantageous to invest in Guangdong. Many investors in Hong Kong, in fact, moved their plants to Guangdong to take advantage of the abundance of factors of production in the area. The geographical location and cultural affinity were crucial elements for the province of Guangdong in creating an economic link also with Macao and Taiwan, which in order to take

advantage of the abundance of factors of production (as for Hong Kong), moved their production facilities to the Chinese province (Maruya, 1998).

Soon, however, Guangdong was in the middle of the Chinese political debate in which were opposed two major parties, the reformist leaders, liberal and market-oriented, versus the conservative leaders. The first favored the process of reform and openness that was taking place in the province, accepting most of the requirements of the local government. Conservatives instead, demonstrated a degree of skepticism, especially for the speed at which the reforms were taking place and the continued demand for more power by the local government of Guangdong (Cheung, 1998). While trying to establish a balance between the two political orientations, Deng Xiaoping embraced more and more the reformists thought ensuring an ever greater autonomy to the province. A document issued in 1981 strengthened the idea of continuing with the reforms with the process of opening to the outside and to grant greater autonomy and more powers to the province.

In the early 1980s, after repeated warnings from the central government, some of the powers granted to the Guangdong were scaled back, because of the detection of trafficking and crimes related to the purchase of goods with favorable exchange rates in the SEZ and the resale on the market with high profits. Despite this, Guangdong did not seem to suffer any crisis thanks to the support of the reformists. Deng Xiaoping, in fact, during his visit to Guangdong in 1984, found that in the SEZs and coastal areas it was necessary to continue the reform process. Therefore he decided to open fourteen more coastal cities which were granted the status of SEZs, thus inciting further reforms. With a document issued in 1985 Guangdong Province was granted greater autonomy and powers and freedom in special policies for a further five years.

In the early 1980s one of the main objectives of the development of Guangdong was the improvement of infrastructures. A great amount of resources were therefore invested for the construction of highways, subways, railways, power stations, etc. The province quickly become extremely advanced in terms of infrastructure thanks to the use of the latest technologies. As an example, the infrastructure created for

mobile phones networks represented a further advantage for investors (Maruya, 1998).

In 1988, a package of reforms concerning ten areas was launched: finance, foreign trade, labor market, taxation, business, education, science and technology, housing privatization, greater autonomy of Guangdong granted by the central government, and a limited "democratization" of the process of policy-making (Cheung, 1998). It was a wide reform and therefore difficult to be implemented. The only province that seemed to be able to succeed was Guangdong, but the political and economic difficulties of the entire nation by the end of 1988 made problematic the effective implementation of these reforms. Guangdong succeeded in extending the economic opening to a wider area of Pearl River Delta, which included twenty-eight cities and counties, and instituted the opening of new areas in other zones to the West and to the East of the province. The reforms that were actually implemented were only the liberalization of the housing market and the creation of a regional bank.

The incident in Tiananmen Square in June 1989 shook the whole of China and exacerbated the already existing tensions between the central government and the province of Guangdong. The massive process of reform carried out until that moment gradually slowed because of funding cuts and a reduction in the autonomy of the province. The central government was at this point dominated by the conservative party that slowly abandoned the process of reform and the opening-up. In this way, the government tried to move the management and coordination of the activities undertaken locally by the provinces at central level and to control experiments. Guangdong was soon eradicated its special status and never fully implemented the document containing the reform package of 1988.

In 1992, Deng Xiaoping went back to Guangdong with the idea to resume the process of reform and opening-up. Among the interventions, the government invested in urban infrastructure and initially financed, in particular, transport infrastructure and energy that were used to promote the activities of the SEZs. In the second stage, it funded investments for the construction of houses in cities, commercial districts, and logistics facilities. In this way, the PRD was creating an environment more and more favorable to economic development. In subsequent

years, Guangdong's economy was increasingly growing so as to suggest to the leaders of the central government to extend the policy of opening-up to other Chinese regions (Yusuf, 2007).

In 2001, the Northeast region of Guangdong showed difficulties that could lead to social and political consequences. State-owned enterprises had become increasingly less competitive, low-profit, and also showed a diminishing importance in trade with foreign countries. (Yusuf, 2007). In the last few years, the Chinese government launched a new strategy aimed at favoring the establishment of a flow of Chinese investments abroad - the Going Global strategy. This decision was mainly due to the need of entering new markets because of the excessive production, unemployed labor supply, high domestic saving rates, global financial imbalance, and need of resources (Hess, 2006, Lee et al., 2011, Di Tommaso et al, 2013). Most of the Chinese investments go to Asian countries (in 2010, 65% of China's total outward direct investments), but recently the amount of investments going to European countries has dramatically increased. Only in the initial phase of the Going Global Strategy, China's favored destinations, such as African and Asian countries, as main destinations of outward direct investments. Guangdong province in 2010 was the fourth region in term outward foreign direct investments in China (Di Tommaso et al., 2013).

4.2 ECONOMIC FACTS

Since the moment in which China launched the opening policy and the reform process, Guangdong Province began a phase of strong growth outpacing other Chinese provinces. In 1978, Guangdong was ranked sixteenth place in terms of per capita GDP among the Chinese provinces and the local GDP accounted for 5.1% of the national total. Already in 1995, the high GDP growth led Guangdong to the fifth position of the same ranking and to have a local GDP amounting to 9.8% of the national total (Naughton, 2002).

Until the start of the reform process Guangdong province had often had performances that were below the national average. In a few years, the province managed to considerably grow in terms of GDP which grew on average in the period 1978-1994 by 14.2 %, while in the same period the national average GDP grew by 9.8%. In 1989, Guangdong was the province with the highest GDP (Maruya T., 1998). Other macroeconomic indicators behaved in the same way making the province jump to the first positions in terms of growth. Guangdong was the first province in terms of the amount of foreign capital used, exports, investment in fixed assets, and retail sales of goods. It was also strong for industrial and agricultural production (Figure 4.2).

Table 4.1. Main economic indicators

	GUANGDONG					CHINA				
	1978	**1990**	**2000**	**2010**	**2012**	**1978**	**1990**	**2000**	**2010**	**2012**
Population (10000 persons)	5064	6246	7499	10441	8636	96259	114333	126743	134091	135391
Area (sq.km)			179813					9596961		
GDP (100 million RMB, constant prices)	186	1559	10741	46013	57068	3645	18668	99215	401202	519322
Per capita GDP (current prices)	370	2484	12736	44736	54095	381	1644	7858	29992	38449
Number employed	2276	3118	3989	5752	5966	40152	64749	72085	76105	-
Agricultural Output (100 million RMB, current prices)	86	601	1701	3755	4657	1397	7662	24916	69320	-
Industrial Output (100 million RMB, current prices)	207	1902	16904	93463	105050	4237	23924	162885	698591	-
Exports (100 million US$)	14	222	919	4532	5741	98	621	2492	15778	20489
Retail prices Index (1978=100) (%)	100	255	417	472	507	100	208	354	406	-
Average wages (RMB)	615	2929	13823	40358	50577	615	2140	9371	36539	-

Source: Author's elaboration on Guangdong Statistical Yearbook (2013) and China Statistical Yearbook (2012)

At the beginning of the reform process Guangdong's economy was based mainly on the primary sector which constituted about 30% of GDP and on the secondary sector for 46.4%. Since the second half of the 1980s, there was a change in the trend accompanied by new policies undertaken by the government. Guangdong became more and more important in the industrial sector gaining about 49% of the total GDP of the province. Light industry in particular had an important role since it produced on average about 60% of total industrial output and grew by 10% in the early 1990s. At the same time, the heavy industry sector grew at high rates and in the first half of the 1980s had tripled the gross value of output with respect to 1978.

The local government pushed the growth of agriculture and light industry. In the early 1980s, light industry had an average growth rate of 18.1%, while at the end of the 1980s it had reached 24.5%. The agricultural sector instead had an average growth rate of 7.5% between 1978 and in 1984 constituted about 22% of GDP (Maruya T., 1998).

The industrial structure of Guangdong is also reflected in its employment structure. During the period of reforms the industrial sector followed by that of the services showed a huge capacity to absorb labor force (Maruya T., 1998). The agricultural sector however, not only seemed to be unable to absorb the supply of labor, but the number of workers employed in that sector in absolute terms declined. In fact, in 1978, 74% of the workforce was employed in the agricultural sector, while in 1994 people employed in this sector went down to 42%. On the other hand, the industrial sector and services increased the number of employees respectively of 19 and 12 percentage points.

Comparing the structure of employment in Guangdong with that of the whole of China, it is possible to notice some differences both in the entity and the direction of change. In Guangdong the change was more intense and the sectors affected by the migration of surplus of labor from the agricultural sector were different from those involved considering the whole of China. In Guangdong the industrial sector absorbed more workforce than the service sector, while at the national level the service sector absorbed more labor force. There were also differences in the relationship between the speed of growth and the changes in the employment

structure. In Guangdong, major changes occurred towards the end of the period of reform, that is, when economic growth was sustained. The opposite happened at the national level (Maruya T., 1998).

In the early 1980s the economy of the province was driven by investments and exports (Maruya T., 1998). Investments in fixed assets increased on average by 36 % between 1980 and 1984 and then, in the late 1980s, the growth slowed down. The amount of fixed capital until 1980 was 15% of GDP. It increased to almost 30% in 1984 and exceeded 50% in 1994. It therefore grew at high average rates which reached 12.9% between 1991 and 1994.

Another important factor that contributed to the overwhelming growth of Guangdong was the rapid increase in exports. Between 1979 and 1994, exports grew by 38%, constituting 39% of the total value of Chinese exports. Therefore, the share of exports in GDP increased from 13% in 1978 to 95% in 1994. The annual rate of growth of exports from the beginning of the 1980s, the late 1980s and early 1990s were respectively 6%, 29% and 35%. Furthermore, it is relevant to note that in Guangdong exports were much greater than imports, and created a large trade surplus. Trade surplus during the 1980s was 7-11% of GDP, while in the 1990s increased to 16-35%. The contribution of exports to economic growth, in fact, became higher by the end of the 1980s.

Looking at China's trade balance, however, things did not go exactly as in Guangdong. Although China's trade increased during the 1980s and early 1990s, the trade balance was continually in deficit. At the end of the 1980s, the deficit became higher and slowed economic growth. It diminished when the Guangdong model of development was extended to other regions of China. This was due in part to the policy of openness that initially only covered the prefectures of Shenzhen, Shantou and Zhuhai.

Before the launch of the reform process of 1978, the Chinese government controlled most of the output of the country. In 1978, about 87% of government revenue came from public enterprises and about 78 % of the workforce was employed in SOEs. Private companies and foreign companies were almost non-existent. The purpose of this control was to make China's economy self-sufficient. Foreign trade was

allowed only for a limited number of commodities that could not be produced in the country.

With the reform process, the way in which public enterprises were operating in the area began to change. That was when the central government began to allow farmers to sell part of their crops on the open market and when the SEZs were instituted with the aim of attracting foreign capital and invigorate the export and import of high-tech products and knowledge.

In 2010, Guangdong produced 13.4% of China's industrial production. In 2012, Guangdong's exports accounted for 28.7% of national total while GDP constituted 11% of the national total.

As shown in the table (Table 4.2) Guangdong over time has gained more and more importance in the national context even though it is a small region when compared to others. Guangdong is the Chinese province that in 2010 had the greatest GDP, equal to 11.5% of the national total.

Guangdong's GDP in 2012 grew by 8.2% over the previous year and in the last thirty years it has grown at an average rate of 13.5% (Table 4.2). Also the industrial output shows a remarkable growth in recent years. In 2012 it increased by about 11% and for the entire period 1980-2012 it had an average growth rate of 14%.

Table 4.2. Guangdong's GDP and Gross Output Value in various years

	GDP (100 million RMB)	Per Capita GDP (RMB)	Gross Industrial output Value (100 million RMB)	Annual GDP growth rate (%)	Annual per capita GDP growth rate (%)	Annual growth rate of Gross Industrial Output (%)
1980	250	481	249	16.6	14.8	0.5
1985	577	1026	535	18.0	16.2	6.0
1990	1559	2484	1902	11.6	9.1	18.0
1995	5933	8129	9721	15.6	12.0	17.6
2000	10741	12736	16904	11.5	7.1	18.4
2005	22557	24647	41662	14.1	12.7	19.2
2010	46013	44736	93463	12.4	9.5	21.9
2012	57068	54095	105050	8.2	7.4	10.8
				Average growth rates (%) (1980 - 2012)		
				13.5	11.1	14.1

Source: Author's elaboration on Guangdong Statistical Yearbook (2013)

As already mentioned, for a long time the GDP was reinforced by the secondary sector and to a lesser extent from the primary sector. In the mid-1980s a change in trend has brought a significant decrease in the importance of the primary sector. The services sector has slowly replaced the primary sector, growing at very high rates. Around 2001-2002 the tertiary industry exceeded the secondary sector in the composition of GDP. In 2002, about 47% of the GDP came from the service sector (Figure 4.2).

GDP is mainly driven by the secondary sector. In particular, in 2012 the secondary sector contributed for almost 49% of GDP, the service sector at 46% and the primary sector only about 5%. From 1978 to 2012, the importance of the primary sector has decreased, while the tertiary sector has assumed an increasingly important role.

Figure 4.2. Composition of GDP by Industry

Author's elaboration on Guangdong Statistical Yearbook (2013)
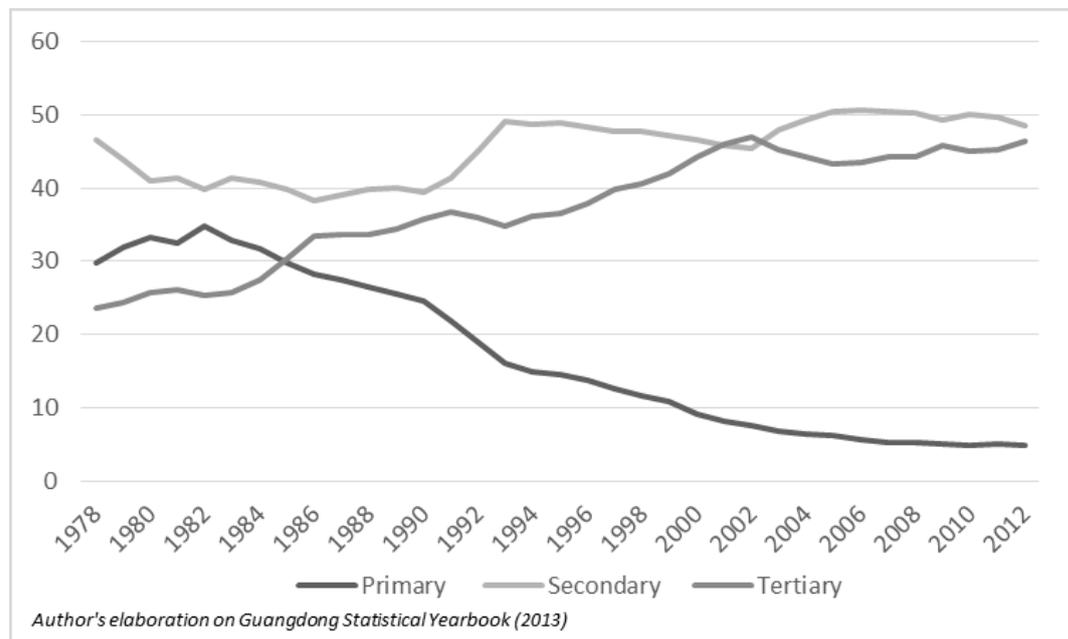
Within the industrial sector, light industry has traditionally had an important role. This role, however, gradually reduced, starting from the second half of the 1990s.

In 2012, light industry produced 37% of the total industrial output of enterprises above designated size (ADS)[12] (Figure 4.3).

Figure 4.3. Composition of Gross Output Value of Industrial Enterprises Above Designated Size

Author's elaboration on Guangdong Statistical Yearbook (2013)
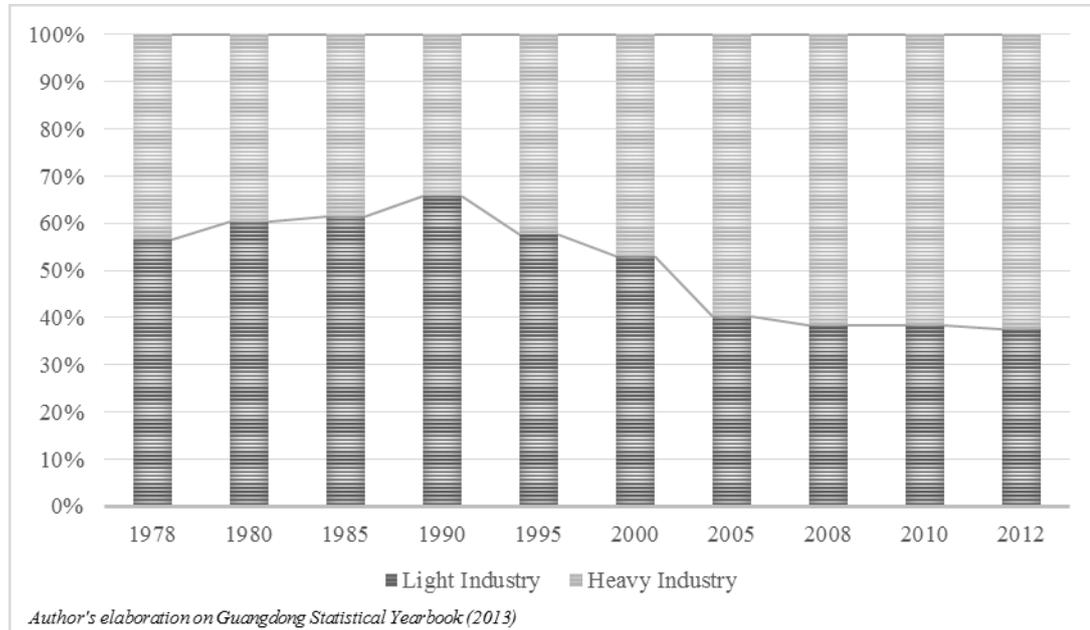
Guangdong can be considered as the manufacturer of China. In particular, the sectors which in 2010 provided a major contribution to the output are the sectors of communication equipment, computers, and other electronic materials (Table 4.3). Guangdong is also a great producer of plastic products, furniture, and electrical machinery and equipment. It is also a major producer of refrigerators at the national level and also, aquatic products, bicycles and microcomputer.

Table 4.3. Industrial Output by sector of enterprises Above Designated Size (2010, 100 million RMB)

	CHINA	GUANGDONG	%
Textile	28507.92	2623.69	9.20
Leather, Fur, Feather and Related Products	7897.50	1543.69	19.55
Furniture	4414.81	1098.51	24.88
Plastics	13872.22	3310.21	23.86
Paper and Paper Products	10434.06	1656.31	15.87
Printing, Reproduction of Recording Media	3562.91	837.56	23.51
Electrical Machinery and Equipment	43344.41	9353.08	21.58
Communication Equipment, Computers and Other Electronic Equipment	54970.67	19228.34	34.98
Textile Wearing Apparel, Footwear, Caps	12331.24	2304.28	18.69

Source: Author's elaboration on Guangdong Statistical Yearbook (2011) and China Statistical Yearbook (2011)

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[12] Firms Above Designated Size (ADS) have a turnover that exceeds 5 million RMB. Official Chinese Statistics mainly provide data for firms ADS rather that the total.

The province of Guangdong exports a high percentage of its production. In 2012, the value of exported goods was 574 billion dollars (Table 4.4). Approximately 28% of China's exports are undertaken in Guangdong, while imports are 22.5% of the national total. Guangdong's total value of imports and exports is the highest in China, even higher than that of the provinces of Jiangsu and Shanghai. In 2012 this value was equal to 984 billion dollars.

Foreign trade in Guangdong grew in the period 1990-2008 to an average annual rate of 17.2%. Until 1999, before China became part of the WTO (World Trade Organization), Guangdong exported at an average annual rate of 15%. Between 2000 and 2008, however the average annual rate was 19.5%. Exports in particular have grown at very high rates starting after 2001, with rates almost always above 20%. In 2008, however, exports have grown over the previous year by only 9.5% with a deep decline in 2009, when exports decreased by 11.5 percentage points. This is of course due to the financial crisis that affected also the economies strongly connected to the US and Europe.

In fact, excluding the Asian countries to which 60.6% of Guangdong' exports are directed (Hong Kong receives 38.3% of the total exports), Guangdong's favorite exports destinations are European countries (13.6%) and the United States (15.9%). Though it seems that after 2008, Guangdong province is gradually increasing the share of exports directed to Asia at the expenses of Europe and the United States. Only in 2008, the share of exports directed to Asia, Europe, and USA was respectively 53.4, 15.9, and 19.1.

With regard to imports, these have grown considerably until 2008. The average rate of growth between 1990 and 1999 was 14.1%, while from 2001 to 2008 the average annual growth rate was of 18.4%. Also in this case, imports suffered a drop of -9.7% in 2009. About 75% of imports of Guangdong come from Asian countries, especially from Taiwan, Japan, Korea and the ASEAN[13] countries. Relatively small percentages of goods are imported from the European Union (8%) and the USA (4%).

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[13] Association of South East Asian Nations, whose members are: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

Table 4.4. Foreign trade in Guangdong, 1990-2012 (100 million US$)

	Total Imports and Exports	Exports	Imports	Annual Growth rate (%)		
				Total Imports and Exports	Exports	Imports
1990	418.98	222.21	196.77	17.8	22.7	12.7
1995	1039.72	565.92	473.8	7.6	12.7	2.0
2000	1701.06	919.19	781.87	21.2	18.3	24.8
2001	1764.87	954.21	810.66	3.8	3.8	3.7
2002	2210.92	1184.58	1026.34	25.3	24.1	26.6
2003	2835.22	1528.48	1306.74	28.2	29.0	27.3
2004	3571.29	1915.69	1655.6	26.0	25.3	26.7
2005	4280.02	2381.71	1898.31	19.8	24.3	14.7
2006	5272.07	3019.48	2252.59	23.2	26.8	18.7
2007	6340.35	3692.39	2647.96	20.3	22.3	17.6
2008	6834.92	4041.88	2793.04	7.8	9.5	5.5
2009	6111.18	3589.56	2521.62	-10.8	-11.5	-9.7
2010	7848.96	4531.91	3317.05	28.4	26.3	31.6
2011	9133.34	5317.93	3815.41	16.4	17.4	15.0
2012	9839.47	5740.59	4098.88	7.7	7.9	7.4
				Average annual growth rate (%) (1990-2012)		
				16.2	17.2	15.0

Source: Author's elaboration on Guangdong Statistical Yearbook (2013)

Guangdong is a major trader of electronics and mechanics and high/new tech products (Table 4.5). In 2012, 68% of the total exports of Guangdong were electrical and mechanical products, 37% of which were electronic products, 17% were machinery and equipment. Also high-tech products and new technologies are extremely relevant in terms of exports. In 2012, 38% of the total exports were in this category. Guangdong is a great importer of new technologies and especially computers (respectively 45 and 15 of the national total).

Table 4.5. Value of Imports and Exports by product type, 2012 (100 million US$)

	Exports	Imports	% of total Exports	% of total Imports
Farm Produce	75	138	1.31	3.37
Mechanical and Electrical Products	3895	2453	67.84	59.85
Metal Products	152	30	2.64	0.72
Machinery and Equipment	1010	460	17.60	11.23
Electric and Electronic Products	2151	1525	37.47	37.21
Transport Equipment	133	73	2.32	1.78
Instruments and Meters	251	337	4.38	8.22
Others	198	28	3.44	0.69
High and New-tech Products	2214	1861	38.56	45.39
Biotechnology	0	1	0.00	0.02
Life Sciences Technology	17	20	0.29	0.49
Photoelectric Technology	153	241	2.66	5.87
Computer and Communication Technology	1693	539	29.49	13.16
Electronic Technology	316	930	5.51	22.70
Computer Integrated Manufacturing Technology	18	64	0.32	1.57
Material Technology	12	23	0.21	0.57
Aerospace Technology	3	40	0.06	0.97
Others	1	2	0.02	0.04

Author's elaboration on Guangdong Statistical Yearbook (2013)

4.3 OPENING TO THE WORLD: POLICY TOOLS

4.3.1 Special Economic Zones

One of the first steps in the opening process of China that began in late 1978 was the establishment of Special Economic Zones (SEZs). The SEZs have played a crucial role throughout the period of reforms.

In the SEZs, the local government was allowed to conduct economic policy in favor of some particular regions, businesses and other stakeholders rather than others (Ge, 1999).

In Guangdong three SEZs were set up, Shenzhen, Zhuhai and Shantou, with the aim of experiencing a market economic system projected into the future and create a window for the province and for the whole country open to the rest of the world. Thus, on the one hand, the national economy could be linked to other countries in the world while, on the other, China did not completely open its economy. The SEZs acted thus as "experiments" where several methods, theories and economic instruments were tested. Once efficiency and success of these measures was reached, their use was then extended, if possible, to the rest of the country. In this way the opening process was made more efficient and gradual. The experiments that were conducted in the SEZs covered various fields: attracting and using foreign capital, purchase of foreign production and highly advanced technology, development of a solid economic structure, promoting foreign trade by competitive advantage, and gaining experience in the reforms of the system moving to a market economy (Ge, 1999).

The SEZs were initially established in Guangdong, Shenzhen, Zhuhai and Shantou, aiming in particular at the achievement of three objectives: follow trends of the world economy, test different policies, acting as a laboratory, acquiring new technologies, and new management methods. The creation of employment, local economic growth, and the development of new towns and villages were considered secondary issues (Chu, 1998).

The SEZs were initially structured in such a way that a series of activities that were far from the traditional economic activities were instead promoted, such as education, research and development, tourism, and culture.

Consistent with the objectives of the SEZs, the industry was put at the center of the economies of the special areas. National enterprises, both public and private, were therefore allowed to interact with companies with foreign capital. Moreover, firms of special areas were encouraged to establish partnerships with other companies in the rest of the country, so as to enhance technology transfer and promote growth.

Originally a series of preferential treatment to investors were offered such as taxes for foreign firms at rate of 15%, about three years of tax-exemption and for heavy investments five years of exemption, repatriation of corporate profits, etc. These

treatments were initially available only in SEZs, but some of them were then extended to other cities and regions in China. This extension made the SEZs attractive to the eyes of foreign investors (Chu, 1998).

When Shenzhen was established as SEZ, it was one of the biggest. Nonetheless the household's income in this area was formed mostly from work in agriculture and fisheries. Industry was poorly developed and manufacturing was concentrated in the production of a small number of articles. Exports were almost equal to zero and the contribution that this area gave to the GDP of the province was very low. Furthermore, infrastructure was almost nonexistent and the number of unskilled and semi-skilled workers was inadequate (Ge, 1999). For this reason, one of the main interventions during the startup phase of the SEZ was the creation and improvement of the infrastructures necessary for the development of this area. For this purpose, a high amount of economic resources was devoted in favour of the SEZ, both by local governments and central government.

Table 4.6. Main Indicators of SEZs

	SHENZHEN	ZHUHAI	SHANTOU
Number of industrial enterprises ADS	5835	927	1880
Gross Output value of industrial enterprises ADS (100 million RMB)	21363.05	3072.56	2111.54
Exports (100 million US$)	2713.56	216.37	61.63
Imports (100 million US$)	1954.47	240.44	26.39
Foreign capital actually utilized (100 million US$)	52.29	14.47	1.31

Source: Author's elaboration on Guangdong Statistical Yearbook (2013)

Shenzhen SEZ is now the best performing of Guangdong and in some respects of all China (Barbieri et al., 2009). Foreign trade accounts for about 47% of the regional total and the amount of foreign capital utilized accounts for 22% of the regional total. Shenzhen also hosts more than 15% of the total number of industrial enterprises above designated size located in Guangdong which produce 22% of the regional industrial output (Table 4.6). Shenzhen is mainly focused in the production of electronic devices, communication equipment and computers, while in Zhuhai there is a great production of electronic and electric devices and Shantou emerges in the production of textiles and plastic products (Di Tommaso et al., 2013).

4.3.2 Development Zones

The origin of the development zones can be found back in time, since the periods of enormous trade, especially made by Venetians and Marseilles. The expression "development zones" began to be used only around the 1970s, when they were defined by the United Nations Industrial Development Organization (UNIDO, 1980) as demarcated areas of a country where, to encourage development, was granted special autonomy from the central government.

Over time, various forms of development zones were developed, each taking a different denomination. But one thing that all the development zones have in common, of whatever kind they may be, are the objectives with which they are established. The development zones generally aim at promoting exports, at encouraging development and the use of new technologies, at creating jobs and at supporting the development of advanced low areas (Wong & Tang, 2005). In order to achieve these objectives in the development zones often there are some forms of incentives to attract foreign investors and to facilitate international trade. It is generally a policy instrument that is not applied throughout the national territory.

In the specific case of China, especially in Guangdong, the concept of development zones was introduced around the end of the 1970s, when the Special Economic Zones were established. In a while, several development zones were established throughout China with different incentives and levels of autonomy (Di Tommaso et al., 2013). They had a high degree of autonomy from the central government, special laws and regulations that allowed the creation of favorable conditions for foreign investors and for the export-oriented production (Wong & Tang, 2005).

Satisfied with the success of the SEZs at the end of the 1980s, the Chinese government decided to expand the open-door policy to other areas (in addition to those which were already present in the SEZs) and in 1991 several development zones were introduced in Guangdong: Free Trade Zones (FTZ), Export Processing Zones (EPZ), Economic and Technological Development Zones (ETDZ) and High-Tech Industrial Development Zones (HIDZ).

The Free Trade Zones and Export Processing Zones are areas in which it is ensured a high degree of freedom in terms of imports and exports of goods and where there

are tax exemptions related to specific goods that are re-exported (Di Tommaso et al., 2009; Zeng, 2011; Di Tommaso et al., 2013).

The Economic and Technological Development Zones are areas that are recognized by the central government and in which are adopted favorable tax regimes, for example, easing the tax burden for foreign investors. The purpose of these areas is, in fact, the attraction of foreign direct investments, consistent with the local industrial environment, thus providing incentives also to local companies for the use and dissemination of new technologies. In contrast to the SEZs, these areas have little autonomy in terms of choice of policies and in terms of administration (Di Tommaso et al., 2009; Zeng, 2011; Di Tommaso et al., 2013).

The High-Tech Industrial Development Zones are areas recognized by the central government. Their main objective is to encourage the use of new technologies by businesses in order to increase the value added. In these areas, the Guangdong government uses specific programs to encourage research in high-tech sectors (Di Tommaso et al., 2009; Zeng, 2011; Di Tommaso et al., 2013).

The incentives in these areas consist mainly of tax relief on profits, turnover, value added, imports, and local taxes. Some of the taxes are reduced, while others are totally eliminated. There are also exemptions for the first few years of business operation and for imports in the case of export-oriented enterprises. There are also facilities for the rent of the land on which the business is established. In the development zones there is also a focus in improving infrastructure and the efficiency of administrative procedures.

In Guangdong, they are mainly located in the area of PRD, especially in the prefectures of Foshan, Guangzhou and Shenzhen (Figure 4.4). This means that different types of development zones can be found in the same area (e.g. Shenzhen has Duty Free Zones, Export Processing Zones and High-Tech Industrial Development Zones).

Figure 4.4. Distribution of Development Zones in Guangdong Province (2008)
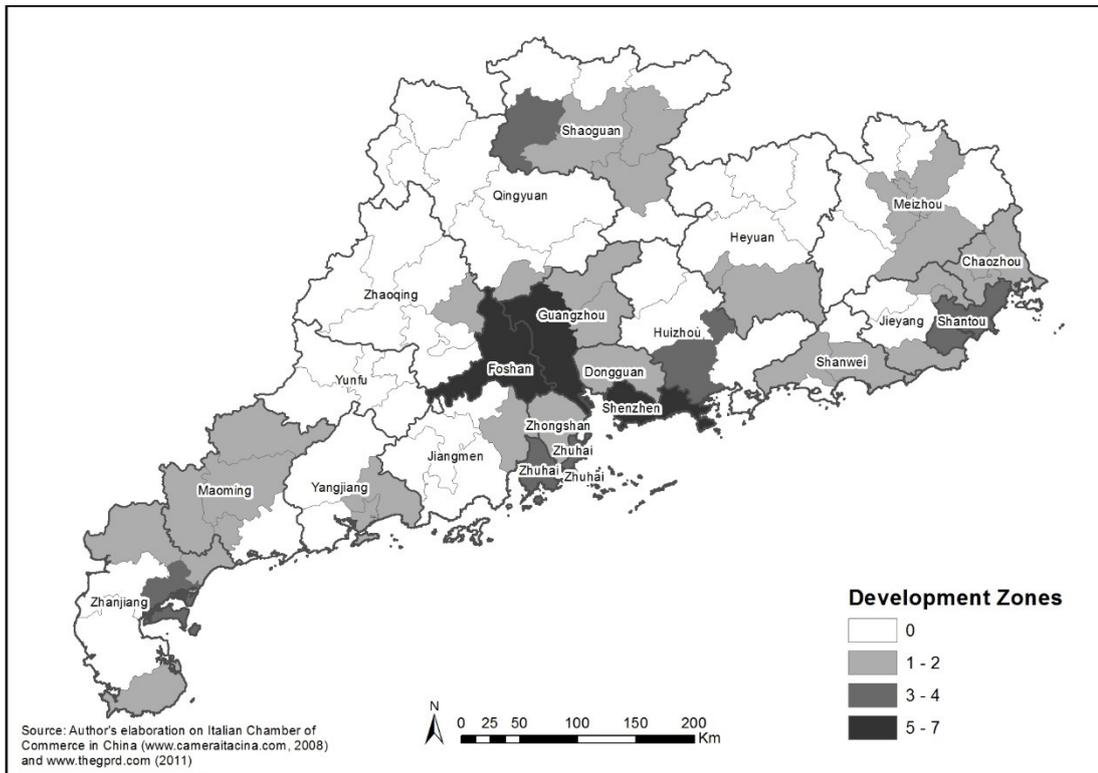
4.4 PEARL RIVER DELTA AS ENGINE FOR DEVELOPMENT

The Pearl River Delta (PRD) is the most economically advanced area of Guangdong Province and one of the most developed of entire China. The region covers an area of 54,733 sq.km which corresponds to about 30% of the entire province. The official definition of PRD includes nine prefectures in Guangdong: Dongguan, Foshan, Guangzhou, Jiangmen Shenzhen, Zhongshan, Zhuhai, part of Zhaoqing (including the urban district of Zhaoqing, the cities of Gaoyao and Sihui) and part of Huizhou (including the urban district of Huizhou, Huyang county and Boluo county). Sometimes it is also used another definition named as the Greater Pearl River Delta, which also includes Hong Kong and Macau (Figure 4.5).

In the Pearl River Delta lives about 53% of the total population of Guangdong. In this area is produced about 76% of the province's GDP. The primary sector produces only 32% of the provincial total, while the secondary and tertiary sectors

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produce respectively 75% and 82% of the provincial total. In the PRD is concentrated 89% of the imports and 88% of exports of the province. Furthermore, the area hosts 82% of the total amount of foreign capital used in Guangdong in 2012 (Guangdong Statistical Yearbook, 2013).

This level of development of the PRD leads to think that the remaining part of Guangdong is much less advanced, and certainly less industrialized. However, the areas east and west of Guangdong and the mountainous areas[14] in the last year have grown in terms of GDP at very high rates, respectively 10.2%, 10% and 8.6%. In these areas the primary sector is particularly developed. The East wing produces about 12% of the provincial total GDP in the primary industry, the west wing accounts for 29% and the mountainous areas for almost 21%. The secondary and tertiary industries, however, also show a significant weight in terms of growth. In 2012, the secondary sector grew by 12.6% in the east wing, by 12.4% in the west and by 9.5% in mountain areas. The tertiary sector however, grew by 7.8% in the eastern area, by 9.9% in the West and by 9% in the mountains (Table 4.7).

Table 4.7. Gross Domestic Product of PRD vs. non-PRD (2012)

	GDP		PRIMARY		SECONDARY		TERTIARY	
	Value (100 million RMB)	Growth rate in 2012 (%)	Value (100 million RMB)	Growth rate in 2012 (%)	Value (100 million RMB)	Growth rate in 2012 (%)	Value (100 million RMB)	Growth rate in 2012 (%)
PRD	43720.86	8.1	924.09	3.3	20952.91	6.7	21843.86	9.7
East Wing	3699.38	10.2	338.42	4.9	1996.11	12.6	1364.85	7.8
West Wing	4212.36	10.0	823.75	4.6	1746.07	12.4	1642.54	9.9
Mountainous Areas	3588.03	8.6	588.60	5.2	1589.38	9.5	1410.05	9.0

Source: Author's elaboration on Guangdong Statistical Yearbook (2013)

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[14] The East Wing includes the provinces of Shantou, Shanwei, Chaozhou and Jieyang; in the West Wing are Zhanjiang, Maoming and Yangjiang; the mountain areas includes Shaoguan, Heyuan, Meizhou, Qingyuan and Yunfu (http://www.gdstats.gov.cn/tjnj/2009/bianzesm_e.htm last time accessed on October 24, 2013).

Figure 4.5. Pearl River Delta
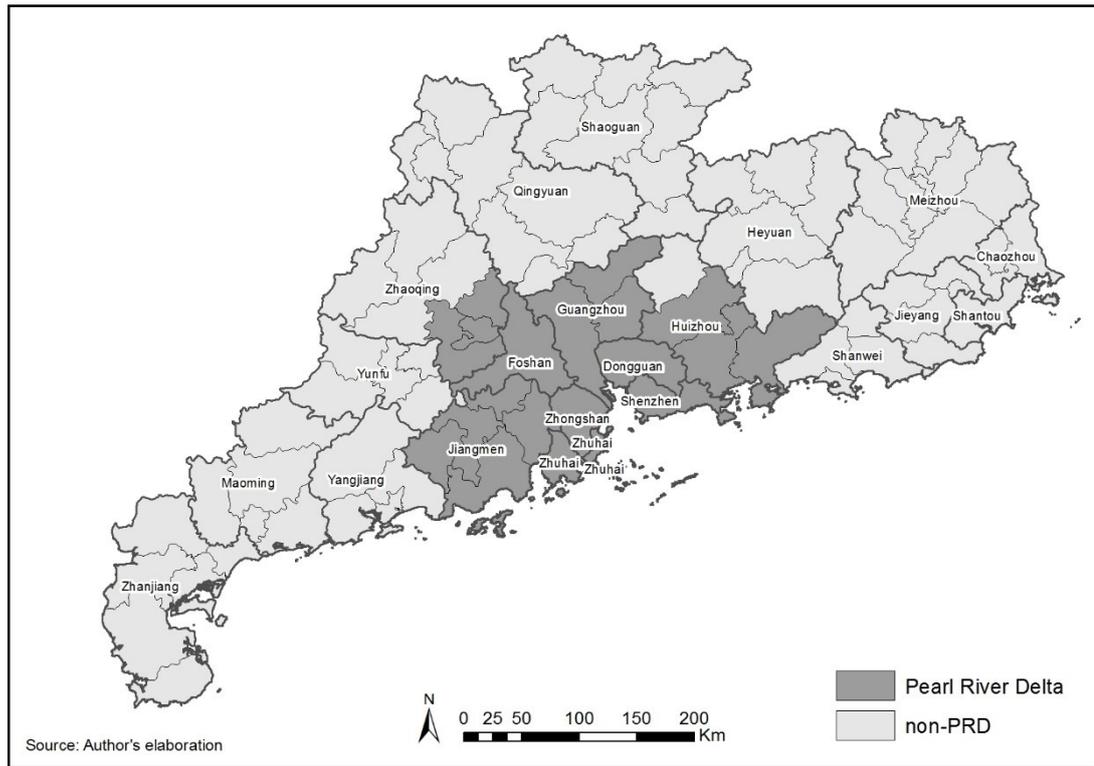
The high economic development that has affected the PRD in recent years is largely due to its proximity to Hong Kong, with who, already before the launch of China's opening policies in 1978, entertained strong strategic ties. Furthermore, as already discussed, some of the areas of PRD have been the areas in which the very first policies of opening-up were implemented. The aim was to use Hong Kong as a bridge connecting China to the external world; southern China would have been the laboratory in which to study the capitalistic approach of Hong Kong and the rest of China would have consequentially absorbed it. The relationship with Hong Kong has, however, been planned to be mutually beneficial and is effectively represented by the popular slogan 'front shop, back factory': the Hong Kong 'shop' had management skills, money and consolidated international relations, while the PRD 'factory' could count on low-cost land and labor coming from inland China (Di Tommaso, Rubini & Barbieri, 2013; Yeung, 2010). After the opening up of the Guangdong economy, Hong Kong firms have increasingly moved their plants to the province and in particular to PRD, thus increasing their dimensions.

The relations between Hong Kong and the PRD do not have only an economic nature. Many Hong Kong residents come from families rooted in Guangdong and this social linkage have caused over the years relevant population flows in both directions. As soon as China opened up to foreign contacts, these cultural relations were coupled with business relations, Hong Kong becoming the global platform for those having economic interests in Guangdong. For this reason, the PRD cannot work without the logistical support of Hong Kong, while the latter exists and flourishes, thanks also to its proximity to Mainland China (Di Tommaso, Rubini & Barbieri, 2013).

In these last few years, the PRD has been facing a greater competition: on one hand new areas are emerging in China, reducing the primacy of the PRD in terms of FDIs and innovation. In particular, the biggest competitor in this sense is the Yangtze River Delta (YRD). On the other hand, emerging countries (such as India and Vietnam) and inland Chinese provinces (such as, among others, Hunan and Guangxi) have surpassed the PRD in terms of low labor costs, which for years was one of the main competitive advantages of the area. The YRD includes Shanghai and the provinces of Zhejiang and Jiangsu. Its economic development started relatively late (in 1984), when the cities of Shanghai, Ningbo and Wenzhou were declared open to foreign investment. Since then, its growth has been rapid and continuous. The advantages of YRD, apart from the closeness to Shanghai, are the availability of a qualified labor force, a widespread entrepreneurial spirit and a coordinated development of the different cities of the region.

As regards the increasing competition from YRD, in 2002 YRD surpassed PRD in terms of FDI attraction and in 2005 in terms of export capacity. The YRD seems to show an increased orientation towards advanced manufacturing technologies and high-tech productions. This undoubtedly represents a concrete threat for the PRD's future development that the government is trying to face with the measures presented in the following section.

With regards to the second type of new PRD competitors, even if a low labor cost is still a key factor of Guangdong province's advantage, there are new areas in inland China (and abroad) that can offer even lower labor costs.

Given the key role played by the PRD in the development of the whole province, in these last few years it has been at the center of several governmental programs. Among these, the 'Outline of the plan for the reform and development of the Pearl River Delta (2008–2020)' (hereafter Outline) and the 'Coordinated plan for cluster development in the Pearl River Delta 2004–2020' of the provincial government (hereinafter, Coordinated Plan).

The Outline confirms the role of the PRD as a pilot area to test specific policies. Great importance is given to the increase in the innovative capacity of the region, especially in the high-tech sectors. This should be accomplished by supporting the circulation of knowledge and the technology transfer processes by means of strengthened linkages between firms and universities/research centers and by favoring the participation of local actors in international co-operation projects on innovation. The aim is to pass from the label 'Guangdong made' to the label 'Guangdong designed' (OECD, 2010; Yeung, 2010).

The Outline identifies specific targets to be reached by the PRD, such as the focus of the PRD on its manufacturing sector in the areas of nuclear and wind power facilities and devices, power transmission and distribution facilities, numerically controlled machine tools and ocean engineering equipment. By 2020, the advanced manufacturing activities should represent 50%of the total industrial value added and high-tech industries should account for 30% of total industrial value added. Furthermore the region is expected to develop ten China-based multinationals with annual sales of 20 billion US$, two or three auto producers of big dimension with output exceeding 100 billion RMB (about 15.7 billion US$) each and to host an extra-large petroleum and chemical industry, with two or three mega refineries and ethylene producers.

The Outline also assigns great importance to the improvement of the social and welfare system and to environmental preservation. By 2012, the pension system should cover 95% of urban workers, 80% of migrants and 60% of rural residents (OECD, 2010; Di Tommaso, Rubini & Barbieri, 2013).

Finally, the Coordinated Plan identifies some main objectives to be reached by the industrial development strategy. Such a strategy has to be based on sectorial support

for the identification of the sectors to which most of the support should be directed; and geographic support, for the identification of the ideal localization of specific industrial sectors.

The economic and industrial development that has interested the PRD for the last three decades, in recent years, seems to slowly spread to the periphery, though with some difficulties and problems.

4.5 THE SPECIALIZED TOWNS PROGRAMME

This paragraph will be focused on one important policy intervention that is the Specialized Towns program. It was launched with the aim of rationalizing the location of businesses in the PRD and in particular to encourage the industrial development of remote areas of the province. In order to achieve these objectives, the local government decided that promoting the agglomeration of firms specialized in certain industry sectors could actually lead to greater industrial development, an increase of competitiveness and innovation allowing faster progress in science and technology.

There is consolidated literature on spatial agglomeration demonstrating the advantages associated with the agglomeration of productive units within a delimited geographic area (Becattini, 1989; Marshall, 1920). Specifically, the benefits related to the agglomeration of firms concern an easier access to specialized resources, an increased ability to create knowledge and technological innovation (Cainelli & De Liso, 2004), a privileged access to specialized local institutions and public goods, and a higher efficiency due to local rivalry (Porter, 1998; Boari et al., 2003; Cainelli, Iacobucci, & Morganti, 2006). Finally, studies show that the location of firms in specialized areas lowers the degrees of vertical integration, thus reducing the opportunistic behaviors. This in turn would induce firms to rely on market transactions and would attract firms engaged in complementary activities (Cainelli & Iacobucci, 2012).

Empirical studies applied to the case of Guangdong show a positive relationship between agglomeration and productivity of an economy that until not long ago was planned by the central government (Fan & Scott, 2003). This positive relationship gained strength also during the period of reforms that took place since the 1980s and that seems to have supported regional economic development.

The territory of Guangdong is characterized by high heterogeneity in the size of cities. There are in fact rural villages, medium-sized cities, but also big cities. The growth of these cities, in some cases, has been driven by the strong need of some major companies to develop specific areas closely related to their field of production. In other cases, the development of spontaneous agglomerations of specialized towns is linked to the privatization of "Township and Village Enterprises" (TVE), or the capacity of the land itself to attract investors (foreign or domestic). In some specialized towns there are in fact a great number of public and private companies, while in other towns, small and medium enterprises cooperate with each other, without the presence of a leader. In few other cases, there are agglomerations of specialized firms that do not cooperate with each other since their localization in certain areas was the result of private initiative and did not derive by collective strategic choices.

The program of specialized towns was launched by the Department of Science and Technology (DST) in Guangdong in 2000 after they realized the existence on the territory of a phenomenon later called "one city, one product". Policy-makers in Guangdong launched new policy strategies that not only contemplated the presence of agglomerations of firms, but also favored growth, development and innovation. Therefore, the program of "specialized towns" was launched in order to promote this phenomenon of agglomeration already naturally present in the territory.

Also, the initial intent of the program was to control and direct the flow of investors that, especially from the 1990s, was invading the province. In a second phase, the program had as its primary objective the promotion of the development of remote areas of Guangdong (around PRD) through the agglomeration and sectorial specialization (Barbieri et al., 2009; Di Tommaso et al., 2013).

The program promoted by the DST is based on some requirements that the towns have to meet in order to be officially recognized the title of "specialized towns" and subsequently to provide support for the development expected by the program itself.

The requirements that a town should meet in order to enter the program and become a "specialized town" are:

- From the administrative point of view, the area needs to be a "town" or a "county" or "urban district";

- 30% of manufacturing output (or employment) must be produced in the town by a single industrial sector;

- The annual value of industrial production must be more than 2 billion RMB.

Once officially recognized, a "specialized town" receives funding from the DST and the local government. These funds should primarily be allocated to the creation of innovation centers which should allow companies to increase the quality and the technological level of products and therefore should lead to an increase in the reputation of the city itself (OECD, 2010; Di Tommaso et al., 2013). The officially recognized specialized towns are entitled to receive a funding of 300,000 RMB provided by the DST.

In short, every specialized town recognized by the government receives financial support and other benefits with the objective of promoting further agglomeration and specialization and improve competitiveness and innovation.

The aim of the government is to foster not only the development of STs per se, but also the collaboration among STs, in order to limit territorial overlapping and intra-provincial competition, to create ad hoc support centers specialized in quality control, to favor the creation of brands at the local level so as to increase the capacity of firms and STs to compete effectively on the international market, and to increase the diffusion of knowledge on the rules for patenting and for the protection of intellectual rights.

The officially recognized STs are one of the main tools used by the local and the provincial government to foster industrial development. To date the number of

officially recognized Specialized Towns that entered the program is 363, though this number is constantly growing [15]. Only in 2003 the total number of specialized towns was equal to 71, about one fifth of the current number.

Figure 4.6. Distribution of Specialized Towns in Guangdong Province in 2003 and 2008
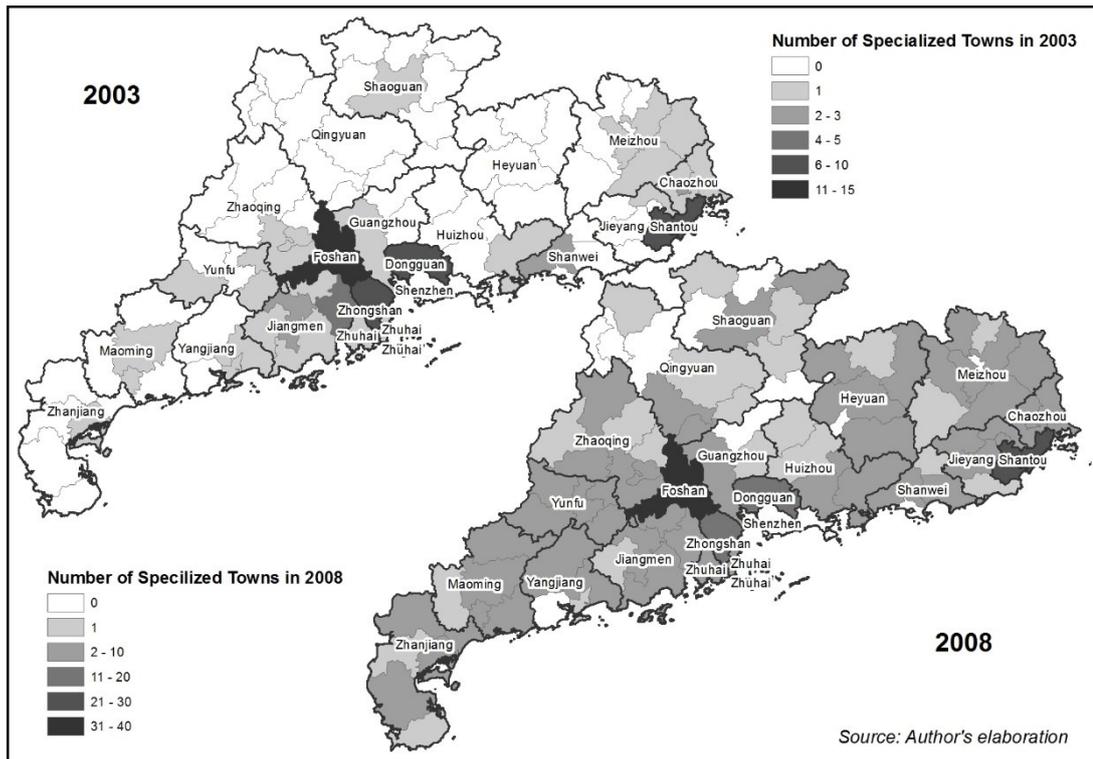
In the early years of the program, the specialized towns were mainly concentrated in the PRD (Figure 4.6). In 2003, 62% of the towns were located in the PRD. In recent years, however, there was a change of trend, and a greater number of recognized specialized towns are recorded in the areas surrounding the PRD. This confirms the fact that the government intends to use this program to encourage agglomeration and industrial development of remote areas of Guangdong.

Observing Figure 4.7, it is possible to note that between 2003 and 2009 the prefectures that recognized a greater number of specialized towns are those located

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[15] Source: http://www.potic.org.cn/client/specialtytown/specialtytown_index.jsp (last time accessed on October 24, 2013)

in remote areas (in particular, Shaoguan, Huizhou, Heyuan, Zhaoqing, Shanwei and Yangjiang).

According to Di Tommaso et al. (2013), the weight of STs on the provincial economy has continuously risen over time. In the time span of only nine years (from 2001 to 2010), STs have increased from representing 3.66%to 28.5% of provincial total GDP, and from 2 per cent to more than 33 per cent of the Guangdong population. The increase is equally impressive in terms of number of firms (from 14,800 in 2001 to more than 950,000 in 2010) and industrial output of the specialized sector (from 42 billion RMB in 2001 to more than 132 billion nine years later).

Figure 4.7. Number of Specialized towns in PRD vs. non-PRD

Source: Author's elaboration
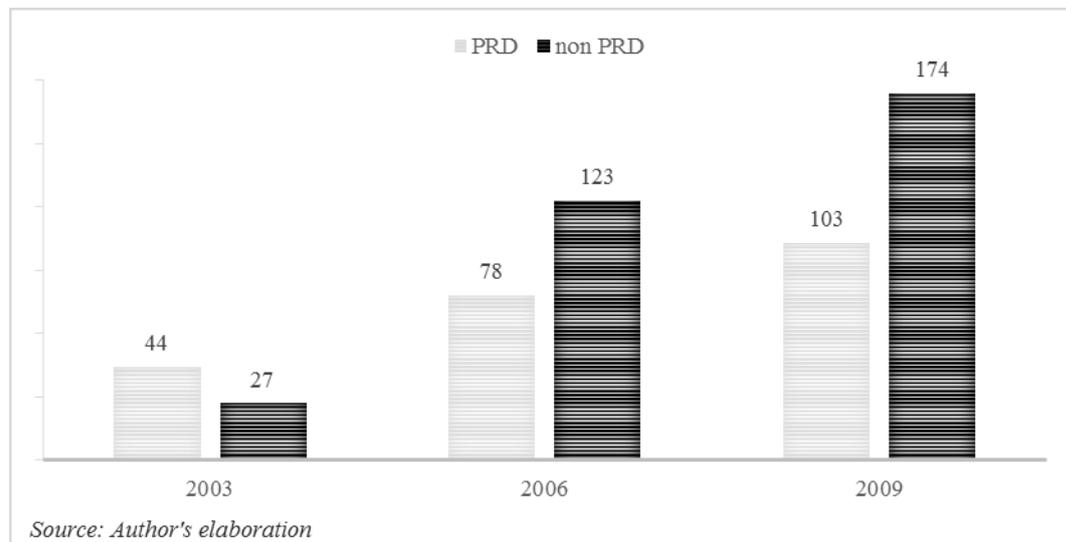
Data indicate that STs have also been affected by the 2008–2009 international crisis, with reductions in 2009 compared to the previous year in terms of weight of STs on provincial GDP (-1.56%), number of industrial firms (-17.2%) and number of firms in the specialization sector (-30.9%). In 2010, however, all figures start to grow again, with a remarkable +25.7% in the value added of the specialized sector (Di Tommaso, Rubini & Barbieri, 2013).

From 2001 to 2009, the number of high-tech firms has increased by more than 2,200 per cent, with a slow but constant growth in their prevalence among the total

number of specialized firms. Furthermore, there has also been an increasing flow of local government funds directed to science and technology and a remarkable increase in the number of accumulated patents, which has jumped from 2,852 in 2001 to almost 154,000 in 2009.

It is also worth looking at the analysis of the structure of the specialized industrial sectors in terms of typologies of firms. There is a large prevalence of private firms, which in 2005 accounted for almost 77 per cent of the total number of firms operating in the specialized sector, for 50.5 per cent of industrial output, for 57.5 per cent of employment and for more than 56 per cent of high-tech staff. In most cases, these private firms are mainly small and medium sized, with a relatively low presence of foreign-funded firms, when compared to the rest of the Guangdong industrial sector (Di Tommaso, Rubini & Barbieri, 2013).

The recent policy strategy of the government is to encourage specialization in high-tech industries and services. The PRD, in recent years, is in fact making a gradual transition. Thanks to the continuous upgrading of enterprises, the PRD is slowly reducing production in low-tech sectors and is increasing medium-tech sectors (Bellandi & Caloffi, 2008).

More than ten years after the launch of the specialized towns program, some problems begin to emerge. The acknowledgment of the "specialized towns" is not enough by itself to stimulate and produce growth in the area. Measures to support businesses become increasingly necessary. In this regard, the DST is following three paths (Barbieri et al., 2009; Di Tommaso et al., 2013).

First, considering that innovation in science and technology can facilitate the development of specialized towns, it is working in the promotion of innovative capability of the traditional sectors. The DST will therefore, on the one hand, create a network of cooperation between firms operating in traditional sectors and on the other wants to increase the skilled labor which is currently primarily low-skilled.

The second path concerns the high-tech industry. The presence of this area in the specialized towns is still low. Furthermore, firms operating in high-tech sector are the result of foreign investments. For this reason, the DST encourages collaboration

between local firms and foreign companies with the aim of increasing the number of domestic firms that operate in the high-tech. A greater number of domestic firms allows greater control of the technological potential of the territory.

Finally, the last strategy on which DST has been focusing in the last few years is the promotion of new towns in rural and mountain areas. The DST is recently started to give priority to industrial development trying to smooth the unbalanced development between the PRD and peripheral areas. For that reason in recent years it has been acknowledged a growing number of specialized towns in rural and mountainous areas.

The program is therefore a tool that is used by DST not only to boost industrial development, but also to balance the regional inequalities, favor specialization in some sectors and improve the performances of traditional industries.

Policy makers are well aware of all the benefits available to firms as a result of their agglomeration, their proximity and cooperation, and their joint action and collective support services.

The formal acknowledgement of STs is, however, not sufficient to obtain the economies and advantages that the international literature traditionally assigns to the agglomeration of firms. It is also necessary to foster and consolidate the establishment of relationships among actors. This is particularly difficult considering that some STs, tend to overcome the administrative boundaries (city, prefecture and town) and become inter-sectorial, increasingly involving actors operating in other fields, with growing linkages among agriculture, industry and services (Di Tommaso, Rubini & Barbieri, 2013).

In these last few years, the provincial government authorities are trying to increase the innovative capacity and to facilitate the technology upgrading of STs. The main policy lines recently followed by the DST are (Barbieri et al., 2009b; Di Tommaso and Rubini, 2005, 2006; OECD, 2010): firstly, support for the innovative capacity of traditional sectors. The aim is to facilitate the cooperation among firms, to improve workforce quality (the target sectors are mainly labor-intensive) and to support firms' technology upgrading.

Secondly, the promotion of high-tech sectors. The number of high-tech STs is still relatively low, and in many cases there is still a prevalence of foreign-funded companies with control over technology. The government is particularly concerned about this situation, especially because recent policy measures pay great attention to the strengthening of the local productive system. Therefore, in the future the government will try to increase the position of STs in order to better control their technological potential. This will be done gradually by starting to encourage the collaboration among local and foreign firms and the promotion of capital sharing initiatives.

Lastly, the promotion of ST establishment in rural and mountainous territories. Recent efforts of the Guangdong government have been dedicated to re-balancing the degree of industrial development among the various prefectures. The DST has already started to pursue this objective by formally acknowledging new STs in rural areas, especially in resource-based and agriculture-related sectors. A second measure moving in the same direction is the promotion of the relocation of high-tech sectors and services to the central PRD area, while moving the low value-added industries towards the external area, as stated in the double relocation policy. This attempt to also re-balance the development of the province by means of STs is confirmed in the previously mentioned "Coordinated plan for cluster development in the PRD, 2004–2020", launched by the Guangdong government to increase the competitiveness of the area by supporting the development of ad hoc clusters. In particular the plan clearly identifies specific industrial priorities to be reached in the next few years in terms of ST promotion.

Even though STs are contributing to industrial growth of Guangdong, this policy has also showed to have some problems (Di Tommaso, Rubini & Barbieri, 2013). Firstly it seems that there is and under-utilization of measures supporting innovation. The formal acknowledgement of a ST is usually followed by the establishment of innovation centers serving all firms that operate in the town. The mere creation of these centers, however, is not a guarantee of their success. In many cases, in fact, these innovation platforms are under-utilized: on one side, large firms have their own internal Research and Development (R&D) resources, and on the other, often small firms do not believe in the utility and safety of external resources to promote

innovation, fearing information leakages and a consequent loss of competitiveness. This fear is also fuelled by the absence of clear regulation on the protection of Intellectual Property Rights (IPRs), delivering insufficient defense both at the national and international level. Furthermore, in some cases the publicly funded innovation centers fail to serve as reference points for the promotion of innovation in STs because they are not properly connected to the local production system and the external world, they do not employ adequately prepared personnel and they are not able to properly inform potential users of the benefits of their support measures (Barbieri et al., 2010).

Secondly, there seems to be insufficient coordination in ST promotion. The intensive growth of STs, together with a severe antagonism among Guangdong towns, has caused the multiplication of 'overlapping' towns in the provincial area (Qian and Stiglitz, 1996). Many of them are directly competing with one another because they concentrate on similar productions. In some cases, the situation is even worse and STs operate not only in the same field, but also in the same specific phase of the productive process (Li & Fung, 2006). A strong improvement to the whole ST production system would derive from an increased effort on the part of government authorities in developing vertical specializations. This implies driving each ST towards the gradual concentration in a specific stage of the production process, while at the same time facilitating the establishment of vertical relationships among STs (supplier–customer and not competitor–competitor relationships). The result of this action would possibly be a reinforced industrial system at the provincial level and the reduction of internal competition among Guangdong ST, which would in turn bring to relationships between towns. These relationships have resulted in the creation of a complex furniture production system that has increased its overall competitive capacity, capable of selling furniture items all over the world.

Finally, there are problems related to the impact of fast industrial development: the use of the ST promotion tool has undoubtedly been among the factors allowing for rapid development in Guangdong province (and in particular in the PRD). On the other side, there has been amazing increase in problems such as air, water and land pollution, resource scarcity, increased labor costs, decrease in the overall quality of

life and so on. For this reason, many ST governments are now designing sets of policies specifically aimed at fostering a harmonious development in the area and at decreasing the 'side effects' of rapid industrial growth.

The local government has always been involved in the development of the Specialized Towns programme. After the launch of the 'one city, one product' policy, the Department of Science and Technology of Guangdong province strongly encouraged the local governments of STs to increase their role in local development.

This became possible following the 1994 fiscal reform of the tax-sharing system, allowing local governments to share part of the tax revenue with the central government. This change has strongly stimulated local governments to play an active role in the development of the local economic system (Wang and Yue, 2010). In particular, the DST has identified specific goals for local town government actions (Barbieri et al., 2009b; Di Tommaso and Rubini, 2005; Bellandi and Di Tommaso, 2005; OECD, 2010; Di Tommaso, Rubini & Barbieri, 2013): to facilitate the creation of support institutions providing services for all firms in the town; to promote R&D, coherently with the national focus on industrial technological enhancement; to favor the diffusion of knowledge within the town, facilitating the flow of specific and reliable information on market scenarios, new technologies, local and international competitors and so on, to single firms. This measure is strategic in STs where there is a prevalence of small and medium-sized firms, for which access to the aforementioned strategic information is more difficult and more expensive to reach; to design and implement sector-specific professional training programmes. Once again, this indication is coherent with the overall priority set by the national and provincial governments in improving the quality and skills of the People's Republic of China's workforce as a way to raise the innovative capacity and the competitiveness of Chinese enterprises; to favor the diffusion of technology by supporting the relationships between firms and universities/research centers. The Chinese government works at reinforcing the university–industry connection (Barbieri et al., 2010); to increase the international visibility of towns by means of national and international events. In accordance with this, many towns have organized sectorial-specific trade fairs, attracting companies not only from China, but from all over the world.

Local governments seem to have followed the indications coming from the DST and have strongly supported the growth of their STs, implementing a wide variety of support actions, ranging from vocational training courses to branding policies at the town level and from the construction of town-level exhibition centers to the organization of big events at the national and international levels.

A common feature of all these interventions is the intent of the local government to avoid supporting specific groups of firms, instead fostering the development of the town as a whole and, as was explicitly argued by one of the interviewed policy makers, maintaining a stable environment that can favor the social and economic development of the town.

In order to facilitate the first application and subsequent diffusion of best practices among STs, there is a plan to select one 'pilot ST' to test the implementation of a sustainable urbanization process, integrated with and supported by technology upgrading, and sustainable growth both at the regional and national levels. Furthermore, policy makers are now trying to promote the evolution of the ST system in order to reach the so-called 'one city, one policy' objective, through the following objectives:

- To simplify the political administration of STs by further decentralizing the town's economic management to local authorities,
- To optimize and strengthen the industrial structure of STs and to manage urban development,
- To restore public accounts to good order in order to have the resources for the renewal of old infrastructures and the construction of new ones,
- To promote quality enhancement, especially in traditional industries,
- To help STs increase their GDP, their innovation potential and, more generally, their competitive capacity.

4.6 NEW POLICY PATHS: REDUCTION OF REGIONAL DISPARITIES

After the opening of China, Guangdong province focused policy intervention mainly in some territories, used as labs for experimentation. Following these interventions, industrial development grew rapidly, while the gap between peripheral areas and the urban developed areas widened. Therefore, in recent years, the government announced that industrial policy measures would be redistributed in the area, trying to favor inner areas, not coastal and outside the PRD, in order to redress inequalities among regions.

Since the late 1990s, Guangdong started to show problems of polarization, which tried to solve by promoting regional integration between PRD and the periphery through the "Mountain Area Development Program" and later with "the Anti-Poverty Development for Rural Guangdong". Since 2005, under the administration of the new governor of Guangdong, the provincial government initiated the "dual-track policy transformation" in order to further promote the upgrading of the PRD and promote more equitable development through the relocation of low-tech production from the PRD to the more peripheral areas.

In general, the rapid economic growth of China has provided a greater emphasis on the topic of regional disparities in transition economies. The literature on China has reached a broad consensus that there is a growing gap between the coastal provinces and the inner regions, mainly due to the fact that the coastal provinces have greatly experienced the reforms of liberalization. Some researchers have focused on the effectiveness of policies such as the "Go West", arguing that the inland provinces are facing more difficulties because they have been much more affected by the effects of globalization. Another part of the literature also argues that China has adopted a gradual approach to reforms, therefore the evolution and importance of regional inequalities are believed to be sensitive to shocks inherent structural reforms as China's accession to the WTO in 2001 (Liao & Wei, 2012; Sakamoto & Islam, 2008; Chen & Fleischer, 1996).

Other authors have made use of spatial analysis to demonstrate that space and geography are not relevant to define the framework of economic inequality in China.

They argue that the evolution of regional inequalities in China is sensitive to the balance between provinces that cannot be simplified with the theories of convergence or divergence (Ke, 2010; Liao & Wei, 2012; Li & Wei, 2010).

Research on Guangdong in particular, has identified a type of center-periphery economy focused on the PRD. Nevertheless, there are various interpretations about the evolution of intra- regional inequalities of Guangdong. Some studies focus on the industrialization of rural areas during the market reform in the 1980s and 1990s and have found a more balanced growth in the PRD (Weng, 1998). Other authors have highlighted the contrary: an increase in the gap between the PRD and the peripheral areas during the reforms of 1980s and 1990s (Gu et al., 2001).

It should be noted a shortage of studies carried out at different levels of administration, except for Fan (1995). Furthermore the literature has focused on the inequalities of the 1980s and 1990s and then does not seem to have updates to the last decade (exception in this case for the work of Liao & Wei, 2012).

Liao and Wei (2012) find a persistent gap between the PRD and the suburbs to which it is added the gap between rural and urban areas. In addition, they argue that only a few counties in the suburbs have benefited from spillover effects from the PRD. This study revealed that the effectiveness of policies aimed at reducing inequality has been limited by geographical barriers and by the effects of agglomeration. The recent efforts to decrease the gap did not achieve the desired effects because the policies used, such as that of "double relocation parks", were directed to specific locations on the borders. They argue that these policies had a low impact on the reduction of overall inequality of Guangdong, and in some cases even worsened the gap between urban and rural areas. The studies proposed in the literature often measure the gap using as indicator per capita GDP or per capita consumption.

Previous studies (World Bank, 2011) showed that a large part of the poor population lives in areas east and west of the region of Guangdong. A small part instead is divided between PRD and the area to the north. It is clear also that the inequalities in Guangdong have geographical reasons. The natural geography of the province is such that the area of the PRD is endowed with a significant advantage over other

areas. The PRD has also benefited from the proximity to Hong Kong and Macao with which it has closer ties that allowed easier access to markets in the rest of the world. Economic activities are then concentrated in the PRD where GDP per capita is much higher than the other areas. This inequality has contributed according to World Bank (2011) to generate the gap between rural and urban areas and in terms of household income.

As already pointed out, in the early 1990s the Chinese model of development has shown the first weaknesses. The rapid industrialization and urbanization in the PRD had concentrated the population and economic activities in urban areas creating significant congestion problems, lack of energy and pollution. For this reason, the government intervened in an attempt to de- congest the PRD and move low and medium tech production to the peripheral areas of the region.

The OECD (2010) describes the intra-provincial disparities in Guangdong and the PRD is depicted as an area not evenly developed because, along with the metropolitan areas of Guangzhou, Foshan and Shenzhen, there are areas much less prosperous as Dongguan and Zhongshan. OECD, however, does not detect phenomena of spillover from the Inner PRD (Guangzhou, Shenzhen, Zhuhai, Foshan, Zhongshan, and Foshan) to the Outer PRD (Huizhou, Jiangmen and Zhaoqing) and very limited growth in peripheral areas outside the Inner PRD.

4.7 FINAL REMARKS

Guangdong province is here considered as an emblematic case. It combines all the characteristics of China: intense and continuous growth, deep industrialization, substantive government's intervention, pursuit of strategic targets, long-term planning. All these elements are also accompanied by the rise of side effects that initially were not taken into account: environmental degradation, rise of inequalities. Guangdong province has for a long time showed several types of inequalities that now the government is trying to address through a re-shaping of planning and policies. In the following chapter, the work proposed tries to statistically define the

territorial unbalances that characterize the region, not only in terms of performances, but also in terms of policy intervention.

5 INDUSTRIALIZATION AND TERRITORIAL UNBALANCES IN GUANGDONG: AN EXPLORATIVE ANALYSIS

5.1 OBJECTIVE OF THE ANALYSIS: ASSESSMENT OF DUALISM IN THE INDUSTRIALIZATION PROCESS

The reference unit chosen for this analysis is the "Province". Specifically, emphasis is on one of the most industrialized, "open", and rich provinces in China: Guangdong (OECD, 2010; World Bank, 2011; Di Tommaso, Rubini, & Barbieri, 2013). In order to increase understanding of the relationship between the industrial growth of this enormous province and all its territories, this analysis is based on a lower administrative level using data referring to prefectures, counties and districts of the province[16]. Economic performances and policy interventions are the two dimensions used in the analysis.

The objective here is to test the hypothesis discussed in the literature (OECD, 2010; World Bank, 2011; Liao & Wei, 2012; Gu et al., 2001; Di Tommaso, Rubini & Barbieri, 2013) relating to a process of industrialization undoubtedly unique (in terms of intensity and speed) but geographically unbalanced. Furthermore it is believed that over time it established a clear dualism between central and remote areas of the province.

With this objective, this study is developed in two phases that in succession aim at a process of analysis that intends to address the characteristics of the sub-regional disparities.

In the first phase the province is divided into two areas that correspond to what can be considered the "center" and "periphery" (Figure 5.1). On the one hand, the central

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[16] Guangdong Province is one of the 22 Chinese provinces. It is further divided into 21 prefectures and 88 counties and districts.

area of the Pearl River Delta (henceforth "PRD") that is divided into 24 counties/districts[17]; on the other hand, the rest of the provincial peripheral territories (from now on "non -PRD") that contain 64 counties/districts[18].

Referring to the two macro-areas, in this first phase of analysis the aim is to study differences in the geographical distribution of economic performance recorded in 2008, the last year for which data are available for all counties. In parallel, the difference in terms of distribution on the territory of policy interventions in 2003-2005 and in 2006-2008[19] is also analyzed.

In order to do so, it was decided to start by comparing PRD and non-PRD through tests of stochastic dominance focusing on the level of performance and on the intensity of policy interventions. Specifically, two hypotheses were empirically tested:

1) The hypothesis that the performance in the PRD in 2008 was greater than in the «non-PRD»;

2) The hypothesis that policy interventions have been more intense in the «non- PRD» than in the PRD (in both periods examined).

The specialized literature on this topic (Gu et al., 2001; OECD, 2010; World Bank, 2011; Liao and Wei, 2012) in fact, emphasizes two issues. First, it seems obvious that the central part of the province («PRD») continues to grow its performance well above the rest of the territories of the province. Second, the authorities of national and provincial governments seem to be engaged in different programs of territorial balance with the goal of relieving congestion in the PRD and promoting industrialization in other areas of the province («the non-PRD»).

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[17] For the purpose of this analysis, the official definition of PRD is not used. Rather a broader definition in which PRD includes all the counties and districts of the prefectures of Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing (24 counties and districts in total) is used.

[18] Non-PRD includes all counties and districts in the remaining prefectures of Shantou, Shaoguan, Heyuan, Meizhou, Shanwei, Yangjiang, Zhanjiang, Maoming, Qingyuan, Chaozhou, Jieyang and Yunfu.

[19] The years used as threshold to define the end of the first period and the start of the second correspond to the end of the Tenth and the start of the Eleventh Five-Year Plan. The Eleventh Five-Year Plan promotes the idea of «socialist harmonious society», which was defined as a society with a low rate of inequalities (Fan & Sun, 2008). This choice attempts to expose possible differences in the distribution and intensity of policy interventions between the two periods.

However, once these hypotheses are tested, this analysis will go further. After classifying all counties and districts of the province according to levels of performance and intensity of policy intervention, this analysis will further study how the two variables (performance and policy) take homogeneous/heterogeneous values within the two macro-areas (PRD and non-PRD). This analysis is also designed to verify the hypothesis found in literature (OECD, 2010; World Bank, 2011) that the performance and policy interventions are distributed more homogeneously in the territory of the PRD than in the non-PRD.

Figure 5.1. Guangdong: PRD and non-PRD
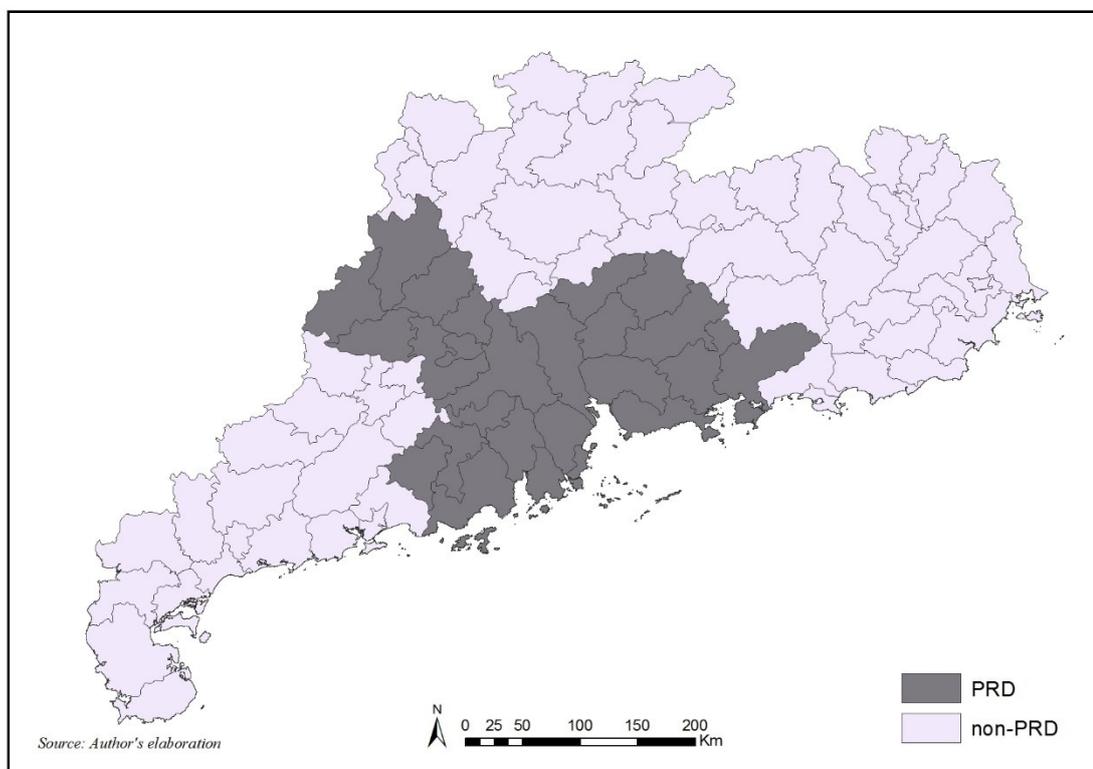
In fact what is being tested at this early stage is likely to confirm the hypothesis of dualism (center vs. periphery, PRD vs. non-PRD) highlighted in the literature even though it is somewhat inaccurate because it underestimates differences within the two macro-areas. That is the reason this analysis goes one step further by proposing a second phase in which the territory of the province is divided into seven sub-areas (Figure 5.2). The PRD will be divided into «Inner PRD» (8 counties/districts) and «Outer PRD» (14 counties/districts). The «non-PRD» will instead be divided into «East Coast» (14 counties/districts), «West Coast» (11 counties/districts), «Middle

Figure 5.2. Guangdong: Seven areas - Inner PRD, Outer PRD, West Coast, Middle West, North, North East, East Coast
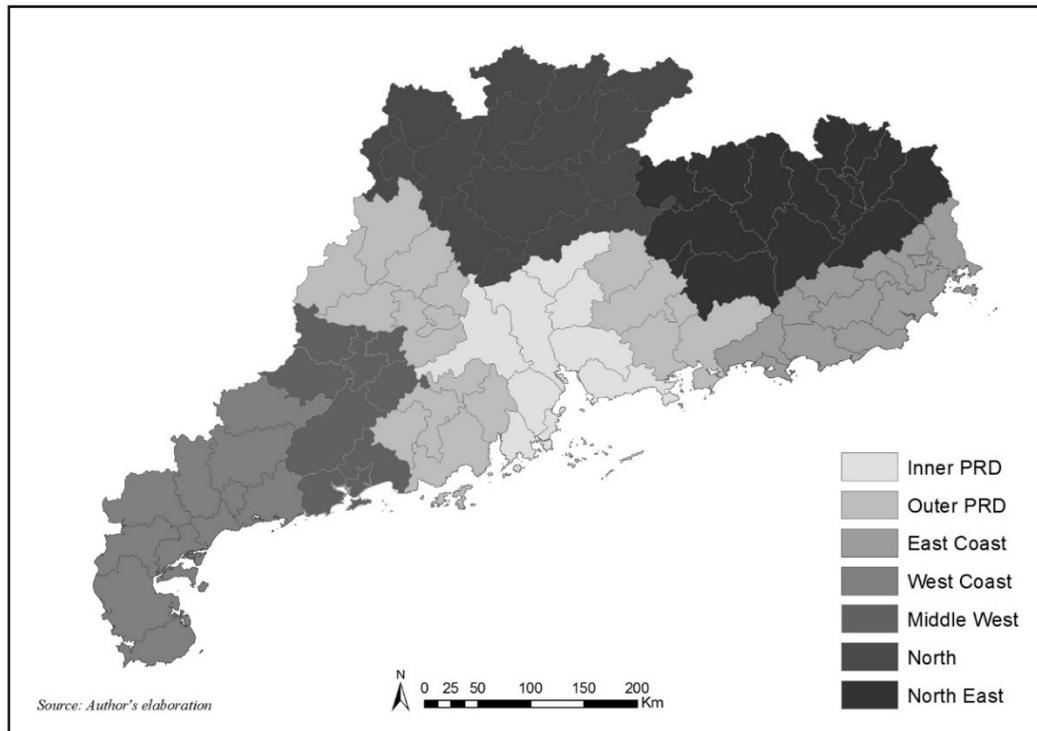
West» (9 counties/districts), «North» (16 counties/districts), «North East» (14 counties/districts)[20]. The objective of the second phase of this analysis is to compare all seven sub-areas defined above for the periods indicated, again in reference to intensity and heterogeneity of performance and policy. As for the previous phase, inferential techniques, such as the two-sample tests of stochastic dominance and of heterogeneity to compare in pairs all sub-areas are used. In this case, however, the analysis consists of an exploratory study to define a ranking concerning the performance (for each of the three-year periods considered) and a ranking concerning the policy of the seven areas, both in terms of intensity and in terms of spatial heterogeneity. These rankings will be constructed by combining the p-values of the directional tests (test of stochastic dominance for the intensity, test of

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[20] Inner PRD includes all the counties and districts of the prefectures of Guangzhou, Shenzhen, Zhuhai, Foshan, Dongguan, Zhongshan; the Outer PRD includes all the counties and districts of the prefectures of Huizhou, Jiangmen, Zhaoqing; the East Coast includes all counties and districts of the prefectures of Jieyang, Chaozhou, Shanwei, Shantou; the West Coast includes all counties and districts of the prefectures of Zhanjiang and Maoming; the Middle West includes all counties and districts of the prefectures of Yunfu and Yangjiang; the North includes all counties and districts of the prefectures of Shaoguan and Qingyuan; the North East includes all counties and districts of the prefectures of Meizhou and Heyuan.

heterogeneity for the spatial heterogeneity) of all pairwise comparisons between sub-areas.

5.2 DESCRIPTION OF DATASET

The data included in the database have different sources. The primary source was the National Bureau of Statistics of China, especially data of Guangzhou Statistical Yearbook of various years, starting from 2001 until 2009. The database includes socio-economic data and is fully described in the following paragraph. The statistical unit corresponds to the administrative level of county/district. For this reason, some of the data were derived from the Statistical Yearbooks of each Prefecture.

Furthermore, the database contains data on Specialized Towns, which were collected from the Department of Science and Technology (DST) and from the Association of Guangdong Province Professional Towns[21]; data on Innovation Centers and Development Zones were collected from DST.

The data refer to 88 counties and districts, and 10 variables have been used to create the indices.

5.3 METHODOLOGY

5.3.1 Indicators of Performance and Indicators of Policy Intervention

In order to create the Indicators of Performance and the Indicators of Policy Intervention the following steps were performed:

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[21] Data and information about Specialized Towns were mainly derived from the website http://www.potic.org.cn/client/specialtytown/specialtytown_index.jsp

1. Identification and calculation of the variables for each county/district. The five variables used for the Index of Performance refer to the year 2008, while the five variables used to calculate the Index of Policy intervention refer to the years from 2003 until 2008.

2. Normalization and combination with respect to variables for each county in each year considered: 2008 for the Index of Performance and from 2003 until 2008 for the Index of Policy Intervention

3. Normalization of all the Indices obtained (both for policy and performance) and combination with respect to years for each county, of the Indices of Policy Intervention for 2003-2004-2005 and for 2006-2007-2008.

4. Normalization of the resulting Indices of Policy Intervention for 2003-2005, for 2006-2008 and for the Index of Performance.

A detailed description of the process applied for the calculation of the Indices of Performance and the Indices of Policy follows:

1. In order to create the Index of intensity of the Policy intervention (*IPol*) the variables thought to be informative in terms of the policy intervention have first been carefully identified and selected for the period 2003-2008.

A brief description of the component variables of the index of policy intervention follows:

- **Specialized Towns** is the variable referring to the number of specialized towns in each county/district for every year from 2003 until 2008.

- **Development Zones** is the variable that identifies the number of development zones in each county/district of the province for every year from 2003 until 2008. As previously mentioned in paragraph 4.3.2, the definition given to development zones is very wide. What unites the development zones is the idea of offering various forms of incentives and benefits to investors. The expression "development zones" means Export Processing Zones, Free Trade Zones, the Economic and Technological Development Zones, and the High-Tech Industrial Development Zones.

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- **Innovation Center** refers to the number of centers of innovation in each county/district in the years from 2003 until 2008. The objective of Innovation Centers is to build a network of technology services available to all users and to also create a driving force to support the technological development of enterprises by developing new systems and mechanisms to achieve scientific, technological and economic breakthroughs.

- **Expenditures Over Revenues** is the relationship between the expenditures and revenues of the local governments calculated for each county/district in every year from 2003 until 2008. The expenditures of local government refers to the distribution and use of funds that the government has raised, in order to meet the needs of economic construction and various other causes. It mainly includes the following items: expenditures for general public services, expenditures for foreign affairs, expenditures for national defense, expenditures for public security, expenditures for education, expenditures for science and technology, expenditures for culture, sport and media, expenditures for social safety net and employment effort, expenditures for medical and health care, expenditures for environment protection, expenditures for urban and rural community affairs, expenditures for agriculture, forestry and water conservancy, expenditures for transportation, expenditures for industry, commerce and banking. Local government revenues refer to governmental income generated by the provision of social products. It includes various tax revenues, such as domestic value added tax (VAT), domestic consumption tax, VAT and consumption tax from imports, VAT and consumption tax rebate for exports, business tax, corporate income tax, individual income tax, resource tax, city maintenance and construction tax, house property tax, stamp tax, urban land use tax, land appreciation tax, tax on vehicles and boat operation, ship tonnage tax, vehicle purchase tax, tariffs, farm land occupation tax, deed tax, and tobacco leaf tax, etc. Local government revenues also include non-tax revenue, such as special program receipts,

charge of administrative and institutional units, penalty receipts, and others non-tax receipts[22].

- **Investment in Innovation** refers to investment in innovation carried out in each county/district in every year form 2003 until 2008. It identifies the investments in the renewal of fixed assets and technological innovation of original facilities by enterprises and institutions[23].

In the construction of the index the variable indicating the presence of Special Economic Zones has deliberately been omitted because this characteristic concerns only three prefectures, and is not a widespread condition of the whole territory.

Variables are indicated as X_{vjtc} where:

v = variable (with $v = 1, \dots, k$)

j = year (with $j = 1, \dots, 6$)

c = county/district (with $c = 1, \dots, 88$)

t = time period (with $t = 1, 2$)

2.   Each of the variables was normalized according to the following rule:

$$\lambda_{vjtc} = \frac{X_{vjtc} - \min_c(X_{vjtc}) + \frac{1}{88}}{\max_c(X_{vjtc}) - min_c(X_{vjtc}) + \frac{2}{88}}$$

where:

- λ_{vjtc} is the normalized variable v in the year j of the time period t in the county/district c.
- X_{vjtc} is the variable v in the year j of the time period t in the county/district c.
- $\min_c(X_{vjtc})$ and $\max_c(X_{vjtc})$ are respectively the minimum and maximum values taken by the variable v in the year j of the time period t in the county/district c.

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[22] Taken from Explanatory Notes on Main Statistical Indicators, Guangdong Statistical Yearbook (2013), http://www.gdstats.gov.cn/tjnj/2013/directory/008/explain.html.
[23] Taken from Explanatory Notes on Main Statistical Indicators, Guangdong Statistical Yearbook (2009), http://www.gdstats.gov.cn/tjnj/2009/table/6/e6_zbjx.htm.

The result of the normalization is an indicator that takes values strictly included in the interval between 0 and 1. In order to avoid the normalized variable taking the value 0 or 1, in the formula, 1/88 and 2/88 were added to the numerator and denominator respectively. 88 is the number of observations for each variable. In this way the risk of getting forms of indeterminacy and infinite values that would have occurred in the case of numerators equal to zero or with the argument of the logarithmic function equal to zero $(\log(0) = \infty)$ is avoided.

Once this step was completed, attention focused on construction of the index of intensity of the policy intervention. Selected variables were combined using Fisher's combining function[24]:

$$IPol_{jtc} = -\sum_{v=1}^{k} {}_X w_v \ln(1 - \lambda_{vjtc})$$

where:

- $IPol_{jtc}$ is the Index of Policy intervention in the year j of the time period t in the county/district c.
- λ_{vjtc} is the normalized variable v in the year j of the time period t in the county/district c.
- $v = 1, 2, ..., k$ denotes the variable (with $k = 5$);
- ${}_X w_v$ indicates the weight given to each variable. For simplicity of interpretation, the sum of the weights of all the variables has been set equal to 1. Giving more weight to a variable, means that this variable has a relatively greater importance than the others. In the analysis, it is assumed that each variable has equal weight. In this way, it is possible to avoid the risks deriving from giving a priori greater importance to one variable over another.

3. Once *IPol* is calculated, it is normalized, in order to obtain for each county/district a value between 0 and 1 (excluded):

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[24] For an analogous application of the function, see Barbieri et al. (2012).

$$\lambda'_{jtc} = \frac{IPol_{jtc} - \min_c(IPol_{jtc}) + \frac{1}{88}}{\max_c(IPol_{jtc}) - min_c(IPol_{jtc}) + \frac{2}{88}}$$

where:

- λ'_{jtc} is the normalized value of the Index of Policy in the year j of the time period t in the county/district c.

- $IPol_{jtc}$ is the Index of Policy intervention in the year j of the time period t in the county/district c.

- $min_c(IPol_{jtc})$ and $\max_c(IPol_{jtc})$ are respectively the minimum and maximum values taken by the Index in the year j of the time period t in the county/district c.

An index very close to one indicates a high intensity of policy intervention for a given county/district with respect to all the others; while if the index value is very close to 0, this means that the intensity of the intervention policy is rather low.

The procedure described here was applied to six years, from 2003 to 2008. All databases contain the same number of observations and the same variables.

Fisher's combining function was then applied again on the six Indices of Policy referring to the years 2003 to 2008 in order to obtain two Indices: one for the period 2003-2005 and the other for the period 2006-2008.

$$IPol'_{tc} = -\sum_{j \in t} {}_t w_j \ln(1 - \lambda'_{jtc})$$

where:

- $IPol'_{tc}$ is the Index of Policy intervention for the time period t in the county/district c.

- ${}_t w_j$ indicates the weight that is given to each year j for the time period t. It is assumed that each year has equal weight.

- λ'_{jtc} is the normalized value of the Index of Policy in the year j of the time period t in the county/district c.

4. Finally the Index obtained is normalized again in order to obtain values between 1 and 0:

$$\lambda''_{tc} = \frac{IPol'_{tc} - \min_c(IPol'_{tc}) + \frac{1}{88}}{\max_c(IPol'_{tc}) - \min_c(IPol'_{tc}) + \frac{2}{88}}$$

where:

- λ''_{tc} is the normalized value of the Index of Policy in the time period t in the county/district c.

- $IPol'_{tc}$ is the Index of Policy intervention in the time period t in the county/district c.

- $\min_c(IPol'_{tc})$ and $\max_c(IPol'_{tc})$ are respectively the minimum and maximum values taken by the Index in the time period t in the county/district c.

As for the Index of Policy, the Index of economic Performance has been calculated through the following steps:

1. In order to create the Index of Performance (*IPerf*) the variables thought to be informative in terms of the economic performance have been first carefully identified and selected for the year 2008.

A brief description of the component variables of the index performance follows:

- **Density of Enterprises** represents the density of industrial enterprises per square kilometer in each county district in the year 2008. The enterprises considered are only those classified by the statistical source as above designated size.

- **Exports** is the real value of commodities (both trade and non-trade) exported across the border of China in each county/district in 2008. It mainly includes actual exports through foreign trade, exported goods in the categories of processing and assembling of customer's materials, compensation trade, exported commodities and articles for public use of Sino-foreign joint ventures,

and cooperative enterprises and ventures with sole foreign investment. Also included are export of samples and advertising articles[25].

- **Industrial Output** refers to the total volume of industrial products sold or available for sale in monetary terms during a given period, which reflects the total achievements and overall scale of industrial production in each county/district during 2008. It includes the value of the finished products in the enterprises, which are not to be further processed and have been inspected, packed and put in storage (where applicable), the income from external processing and the value gain of semi-finished products at the end of the reference period over the beginning[26].

- **Per Capita GDP** refers to value of final products at market prices produced by all resident units per capita in each county/district during 2008.

- **Employment** is the number of persons who have work posts, work in and receive payment from units of state ownership, collective ownership, joint ownership, shareholding ownership, foreign ownership, and ownership by entrepreneurs from Hong Kong, Macao and Taiwan, and other types of ownership and their affiliated units[27] in each county/district in 2008.

They are indicated with Y_{vc} where:

v = variable (with $v = 1, ..., k$)

c = county/district (with $c = 1, ..., 88$)

2.   Each of the variables was normalized according to the following rule:

$$\gamma_{vc} = \frac{Y_{vc} - \min_c(Y_{vc}) + \frac{1}{88}}{\max_c(Y_{vc}) - min_c(X_{vc}) + \frac{2}{88}}$$

where:

- γ_{vc} is the normalized variable v in the county/district c.

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[25] Taken from Explanatory Notes on Main Statistical Indicators, Guangdong Statistical Yearbook (2009), http://www.gdstats.gov.cn/tjnj/2009/table/16/e16_zbjx.htm.
[26] Taken from Explanatory Notes on Main Statistical Indicators, Guangdong Statistical Yearbook (2009), http://www.gdstats.gov.cn/tjnj/2009/table/12/e12_zbjx.htm.
[27] Taken from Explanatory Notes on Main Statistical Indicators, Guangdong Statistical Yearbook (2009), http://www.gdstats.gov.cn/tjnj/2009/table/5/e5_zbjx.htm.

- Y_{vc} is the variable v in the county/district c.
- $\min_c(Y_{vc})$ and $\max_c(Y_{vc})$ are respectively the minimum and maximum values taken by the variable v in the county/district c.

Once this step was completed, the index of performance was calculated. Selected variables were combined using Fisher's combining function:

$$IPerf_c = -\sum_{v=1}^{k} {}_Y w_v \ln(1 - \gamma_{vc})$$

where:

- $IPerf_c$ is the Index of Performance in the county/district c.
- γ_{vc} is the normalized variable v in the county/district c.
- ${}_Y w_v$ indicates the weight that is given to each variable. It is assumed that each variable has equal weight.

3. Once *IPerf* was calculated, it has been normalized, in order to obtain for each county/district a value between 0 and 1 (excluded):

$$\gamma'_c = \frac{IPerf_c - \min_c(IPerf_c) + \frac{1}{88}}{\max_c(IPerf_c) - \min_c(IPerf_c) + \frac{2}{88}}$$

where:

- γ'_c is the normalized value of the Index of Performance in the county/district c.
- $IPerf_c$ is the Index of Performance in the county/district c.
- $\min_c(IPerf_c)$ and $\max_c(IPerf_c)$ are respectively the minimum and maximum values taken by the Index in the county/district c.

An index very close to one indicates a high intensity of performance for a given county/district with respect to all the others; while an index value is very close to 0 means that the intensity of the performance is low.

5.3.2 Classification of Counties and Districts on the basis of the Indices

In order to address the preliminary analysis two indices are used as variables of interest: the index of regional economic performance (*IPerf*) and the index of intensity of the policy intervention (*IPol*).

For the purpose of this analysis the Performance Index only in reference to 2008 is used. As a reminder, the index is composed of the value of exports, the density of enterprises per square kilometer, the value of industrial output, per capita GDP, and the number of employed staff and workers.

The index of intensity of the policy intervention was built using the variables in relation to each relevant year (2003-2008). This index is the result of the combination of: the number of Development Zones, the number of innovation centers, the number of Specialized Towns, the ratio of local government expenditures and revenues, and the value of investment in innovation. Once the annual indices were obtained, they were combined again in order to get a single composite index for the period 2003-2005 and one for the period 2006-2008[28].

The counties and districts were then divided into four categories based on the value of the index, using the quartiles of the distribution of the total of 88 counties/districts such as threshold values. Thus "low" intensity corresponds to values below the first quartile, "medium-low" to a value between the first quartile and the median, "medium-high" correspond to values between the median and the third quartile and "high" corresponds to values above the third quartile. Therefore, the categorical variable follows, by definition, a uniform distribution (hence it is maximally heterogeneous) because each category is observed with a percentage equal to 25%.

It is worth noting that the analysis of the intensity and heterogeneity of phenomena within the PRD and non-PRD (or in the seven sub-areas on which the analysis will focus in the second phase) will therefore be carried out in relative terms. For example any great homogeneity in some regions shall be interpreted as low heterogeneity in comparative terms with respect to the heterogeneity that

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[28] See note 19 for a detailed explanation on the choice of the years.

characterizes the entire Guangdong Province, which is the maximum possible (by definition).

5.3.3 Stochastic Dominance Test

Once the four categories (for performance and for policy) were created and the areas in which the territory has been divided were defined, the analysis proceeded with the elaboration of stochastic dominance tests. They were applied both to compare PRD and non-PRD in the first phase of the study, and to make pairwise comparisons of the sub-areas of the second phase. The test considers the statistical units of the problem that are two areas and one observable ordinal variable. X_1 and X_2 denote random variables that represent the phenomenon under analysis in territory 1 and territory 2. Assuming that X_1 and X_2 can assume one of the four ordered categories A_1, A_2, A_3 and A_4 (corresponding to increasing intensity of the phenomenon under analysis), denote with $Pr\{X_j = A_k\} = p_{jk}, j = 1, 2, k = 1, ..., 4$, the probabilities of the two distributions. Obviously $\sum_k p_{1k} = \sum_k p_{2k} = 1$. The test of stochastic dominance of X_1 on X_2 tests the null hypothesis

$$H_0: X_1 \overset{d}{=} X_2 \text{ (equality in distribution)}$$

against the alternative hypothesis

$$H_1: X_1 \overset{d}{>} X_2 \text{ (stochastic dominance)}$$

In other words, the test verifies whether the phenomenon tends to occur with greater intensity in the area 1 than in area 2 or if X_1 is distributed on categories corresponding to greater intensity than X_2, and then $\sum_{k=1}^{s} p_{1k} \leq \sum_{k=1}^{s} p_{2k}$ per $s = $ *1, 2, 3* and at least in one case the strict inequality holds. Thus a p-value lower than the significance level of the test will lead to rejection of the null hypothesis in favor of the alternative hypothesis of stochastic dominance. Generally, as p-values

assume smaller values, the more likely it is that the empirical evidence favors the hypothesis of stochastic dominance.

Given the limitations of procedures known in the literature based on the likelihood relationship, a permutation test for ordered categorical data based on the Anderson-Darling test statistic (Pesarin, 2001) is performed.

5.3.4 Heterogeneity Test

As previously described, in addition to the stochastic dominance, tests of heterogeneity were performed in order to compare the intensity of performance and policy in two areas. They were applied to compare PRD and non-PRD in the first phase of the study, and the seven sub-areas of the second phase as pairwise comparisons. Consider again the two areas and some observable ordinal variable on a given number of sub-areas which are the statistical units of the problem. As before X_1 and X_2 denote random variables that represent the phenomenon in the analysis in area 1 and area 2, with $\{X_j = A_k\} = p_{jk}, j = 1, 2, k = 1, ..., 4,$, the probabilities of the two distributions.

As known, $X_j (j = 1, 2)$ is said to be maximally homogeneous or minimally heterogeneous when its distribution is degenerate, in other words, when in sub-areas of the j area only one category is observed with probability 1 and all the other with probability zero. In contrast, $X_j (j = 1, 2)$ is defined minimally homogeneous or maximally heterogeneous when p_k = 1/4 with k = 1, ..., 4.

In this analysis the index of heterogeneity[29] of Renyi normalized[30] was used where index values close to 1 indicate a lack of homogeneity in the distribution of

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[29] The concept of heterogeneity can be associated with the concept of concentration and that of diversity: namely, the attitude of the qualitative variable to assume different modes. See for more information: Arboretti et al., 2007; Arboretti et al., 2009.

[30] The index of Rényi of infinite order, used in the field of information theory, and that, for the area j, is calculated as:

$$R_\infty = \lim_{\alpha \to \infty} \left[\frac{1}{1-\alpha} \log \left(\sum_{k=1}^{K} f_k^\alpha \right) \right] = - \log \left[\max_{1 \leq k \leq K} (f_k) \right]$$

In this analysis it is used a normalized version of the index of heterogeneity of Renyi that is obtained with $R_\infty^* = R_\infty / -\log\left(\frac{1}{4}\right)$.

performance and/or policy in the territory (and vice versa if the index is close to zero).

For this type of test in two samples, given the distributions of X_1 and X_2, let us denote by $Het(X_j)$ the degree of heterogeneity of X_j. The test then verifies the null hypothesis:

$$H_0: Het(X_1) = Het(X_2)$$

against the alternative hypothesis

$$H_1: Het(X_1) > Het(X_2).$$

The test statistic is based on the difference of the sampling indices of heterogeneity, hence those calculated on the observed relative frequencies f_{jk} that estimate the unknown probabilities p_{jk}. For this test the index of Rényi of infinite order (see note 30) is taken into account.

The test statistic is then given by

$$R_{\infty 1} - R_{\infty 2} = \log(max_k f_{2k}) - \log(max_k f_{1k})$$

Also in this case, small values of the p-value provide empirical evidence in favor of the hypothesis of greater heterogeneity (reduced homogeneity) in the distribution of X_1. The procedure used is based on the permutation tests proposed by Arboretti et al. (2009).

5.3.5 Indices for Relative Performance and Policy and Comparative Homogeneity Indices

For the comparative analysis of the second phase of the study, the seven sub-areas in which the territory of Guangdong has been divided were compared for both the intensity of performance and policy and the heterogeneity, by performing all possible one-tailed test comparisons pairwise.

For example, indicating with λ_{ij} the p-value of the test of stochastic dominance relative to the hypothesis $H_1: X_i \overset{d}{>} X_j$, with $i, j = 1, ..., 7$, for both the performance

and the policy, a 7×7 matrix of the p-values Λ=[λ$_{ij}$] has been built. Interpreting the p-value as indices of similarity it is then calculated, for each sub-area, the indices of relative performance and relative policy combining the p-values for each row of the matrix, using the formula of Fisher and normalizing the values between 0 and 1. Formally

$$Index(i\text{th } area) = -\sum_{j \neq i} \log(\lambda_{ij})$$

and the normalized version is given by the transformation

$$\frac{Index(i\text{th } area) - min_j[Index(j\text{th } area)]}{max_j[Index(j\text{th } area)] - min_j[Index(j\text{th } area)]}$$

Similarly the comparative index of homogeneity was calculated, which assumes high values in correspondence with the sub-areas that have less heterogeneity and consequently greater homogeneity. Formally

$$CompHomo(i\text{th } area) = -\sum_{j \neq i} \log(1 - \lambda_{ij}),$$

where λ_{ij} is the p-value of the test that verifies $H_1: Het(X_i) > Het(X_j)$. The normalization of this index follows the rule already explained for the indices of relative performance and relative policy.

5.4 RESULTS

5.4.1 Phase 1: PRD vs. non-PRD

Starting from the performance of 2008, the tests of stochastic dominance with a significance level of 0.10 show that the PRD has a higher performance than the non-PRD (p-value = 0.0002). The comparison of the indices of heterogeneity indicate that there is a greater heterogeneity for the group non-PRD (Table 5.1). The tests for heterogeneity show that performances are distributed more homogeneously in the PRD compared to non-PRD (p-value = 0.0334). It can therefore be said that the PRD and non-PRD have inequalities that are worth highlighting. The PRD is an

area where the performance is higher and more homogeneously distributed, whereas in the non-PRD, there are disparities in the distribution of performance, which tend to be lower compared to the PRD.

Table 5.1. Renyi's indices of heterogeneity normalized

	PRD	non-PRD
Performance 2008	0,5000	0,8390
Policy 2003-2005	0,3888	0,8390
Policy 2006-2008	0,3888	0,8390

Source: author's elaboration

With regard to policy interventions, both in the 2003-2005 period and in the period 2006-2008, it seems that the PRD has been the recipient of a lower level of intervention with respect to the non-PRD (respectively p-value = 0.0039 and p-value = 0.0169). The index of heterogeneity of Renyi in both periods shows a greater heterogeneity within the non-PRD (Table 5.1). From the tests of heterogeneity, results show that the non-PRD has a less homogeneous distribution of the interventions compared to the PRD (respectively p-value = 0.0095 and p-value = 0.0035). In both periods considered, the PRD, despite having received less intervention, it was distributed within the territory in a more homogeneous way. The non-PRD instead has enjoyed a greater number of interventions which, however, were not homogeneously distributed throughout the territory.

5.4.2 Phase 2: Seven Groups
In this second phase, as planned, the territory of the province is divided into 7 areas. The PRD: in Inner PRD (I-PRD) and Outer PRD (O-PRD); the non-PRD: North (N), North East (NE), Mid-West (MW), West Coast (WC) and East Coast (EC).

In 2008, the Inner PRD shows a level of performance higher than all other areas (Table 5.2), while the Outer PRD and the East Coast show higher performance only when compared to North and North East. Finally, the Middle West has higher

performance than North East (p-value = 0.0911). The tests of stochastic dominance do not reveal significance in all other cases.

Table 5.2. Matrix of the p-values of the stochastic dominance test (row vs. column) on pairwise comparisons of the sub-areas: Performance 2008

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,0008	0,0004	0,0006	0,0001	0,0002	0,0007
OPRD	0,9992	0	0,1236	0,2394	0,0261	0,0092	0,2877
WC	0,9996	0,8764	0	0,7258	0,3120	0,1937	0,7419
MW	0,9994	0,7606	0,2742	0	0,1425	0,0912	0,5493
N	0,9999	0,9739	0,6880	0,8575	0	0,4573	0,9193
NE	0,9998	0,9908	0,8063	0,9088	0,5427	0	0,9466
EC	0,9993	0,7123	0,2581	0,4507	0,0807	0,0534	0

Source: Author's elaboration

Therefore, a ranking of the seven areas in terms of performance, through the use of the p-value resulting from the test has been developed. The result is that the Inner PRD is the area in which the performance is higher compared to the other areas. The remaining areas in rank order are: Outer PRD, East Coast, Midwest, West Coast, North and North East. This highlights a persistent dominance in terms of performance of the entire PRD on the other areas. The areas North and North East show lower performance compared to all other areas.

The tests for heterogeneity in this second phase study the distribution of the variable by county within each macro-area. These tests show that the performance of 2008 of the Inner PRD is distributed more evenly over the territory than the other six areas (Table 5.3). Also in North East performances are more homogenous, but only with respect to the East Coast (p-value = 0.0613). In all other cases, no significance was found. Observing the comparative index of homogeneity obtained by the combination of the p-value resulting from the tests, the Inner PRD is the area in which the performances are distributed more homogeneously. The remaining areas in rank order are: North East, Outer PRD, North, Midwest, West Coast and East Coast.

The scatter diagram (Figure 5.3) shows that the Inner PRD is the area with the highest performance and at the same time the area with the performance most homogeneously distributed across the territory. The area North East, on the contrary,

has the lowest performance and a higher degree of homogeneity compared to the other areas. East Coast is instead an area in which the performances are among the highest (after Inner PRD and Outer PRD), but are distributed unequally in the area.

Table 5.3. Matrix of the p-values of the directional test of heterogeneity (line vs. column) on the pairwise comparisons of sub-areas: Performance in 2008

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,9956	0,9941	0,9951	0,9941	0,9956	0,9996
OPRD	0,0044	0	0,6642	0,4950	0,4856	0,5289	0,8988
WC	0,0059	0,3358	0	0,3677	0,3208	0,2754	0,6237
MW	0,0049	0,5050	0,6323	0	0,5290	0,4805	0,8588
N	0,0059	0,5144	0,6792	0,4710	0	0,5034	0,8928
NE	0,0044	0,4711	0,7246	0,5195	0,4966	0	0,9387
EC	0,0004	0,1012	0,3763	0,1412	0,1072	0,0613	0

Source: Author's elaboration

In the 2003-2005 period, it is possible to observe that the Outer PRD has an intensity of the policy intervention greater than all other six areas of Guangdong (Table 5.4). The Middle West area instead shows an intensity of interventions higher than the Inner PRD, the West Coast, the North East and the East Coast. Finally, the North area presents levels of policy interventions greater than Inner-PRD, West Coast and North East. From the ranking derived from the combination of the p-values of the test of stochastic dominance, the predominance of the Outer PRD compared to the rest of the region is further highlighted. The Outer PRD seems in fact to have a very marked policy intervention. The remaining areas ranked in order are: Middle West, North, East Coast, Inner PRD, West Coast and North East.

Table 5.4. Matrix of the p-value of the test of stochastic dominance (row vs. column) on the pairwise comparisons of sub-areas: Policy 2003-2005

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,9995	0,6268	0,9808	0,9375	0,5073	0,7927
OPRD	0,0005	0	0,0002	0,0522	0,0027	0,0001	0,0006
WC	0,3732	0,9998	0	0,9959	0,9531	0,4076	0,7337
MW	0,0192	0,9478	0,0041	0	0,1151	0,0047	0,0373
N	0,0625	0,9973	0,0469	0,8849	0	0,0283	0,2375
NE	0,4927	0,9999	0,5924	0,9953	0,9717	0	0,8533
EC	0,2073	0,9994	0,2663	0,9627	0,7625	0,1467	0

Source: Author's elaboration

Figure 5.3. 2008 performance: relative intensity vs. comparative homogeneity
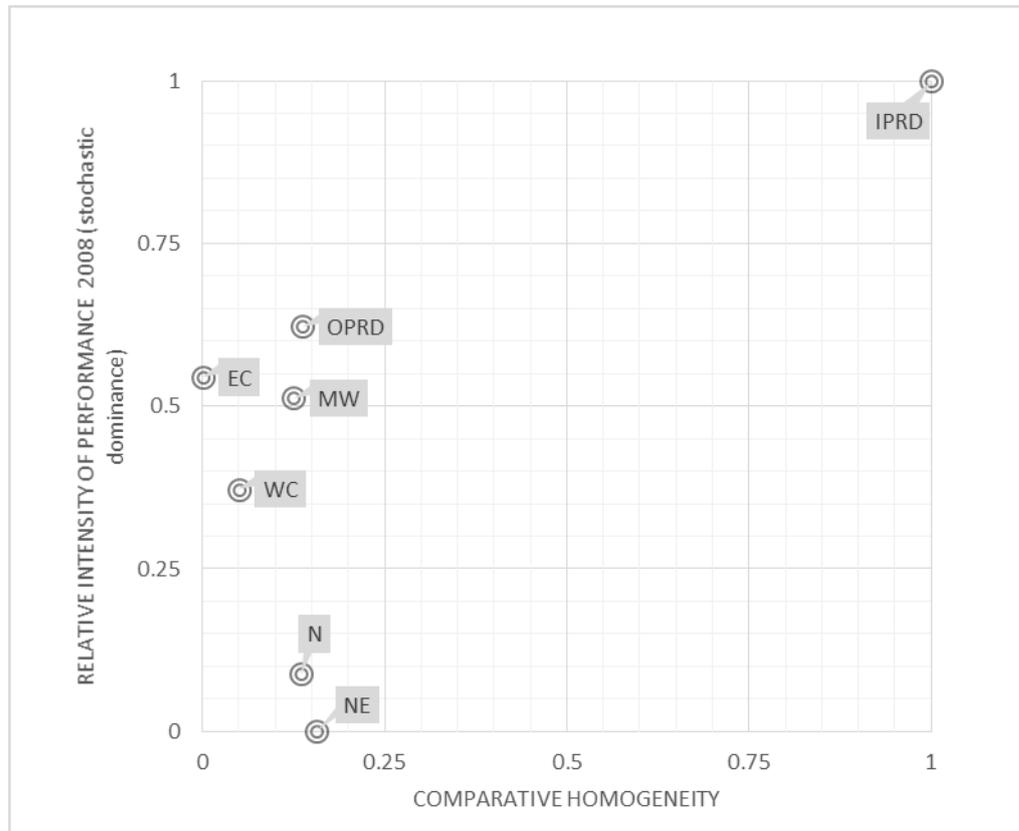
The tests of heterogeneity show that the Outer PRD is more homogeneous than the North, North East and the East Coast (p-value = 0.0205, p-value = 0.0389, p-value = 0.0110) and that the West Coast is more homogeneous than the East coast (p-value = 0.0753) with regard to the distribution of policy interventions in the period 2003-2005 (Table 5.5). In all other tests no significant differences in terms of heterogeneity were found. The ranking of the indices of comparative homogeneity completes the picture and shows that the Outer PRD is the area with the greatest level of homogeneity, followed by West Coast, Inner PRD, Middle West, North East, North and finally the East Coast which is the area with the lowest degree of homogeneity.

Table 5.5. Matrix of the p-values of the directional test of heterogeneity (row vs. column) on the pairwise comparisons of sub-areas: Policy 2003-2005

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,2789	0,4895	0,6108	0,8638	0,7944	0,8877
OPRD	0,7211	0	0,7161	0,8164	0,9795	0,9611	0,9890
WC	0,5105	0,2839	0	0,6078	0,8872	0,8358	0,9247
MW	0,3892	0,1836	0,3922	0	0,8119	0,7186	0,8174
N	0,1362	0,0205	0,1128	0,1881	0	0,3857	0,6008
NE	0,2056	0,0389	0,1642	0,2814	0,6143	0	0,8169
EC	0,1123	0,0110	0,0753	0,1826	0,3992	0,1831	0

Source: author's elaboration

Figure 5.4 shows that the Outer PRD is the area in which the intervention was more concentrated and was distributed uniformly over the whole territory. The North East area has been little affected by policy interventions which are distributed in a rather homogeneous way in the area. The East Coast area has a high policy intervention, but it is distributed very unevenly.

Table 5.6. Matrix of the p-value of the test of stochastic dominance (row vs. column) on the pairwise comparisons of sub-areas: Policy 2006-2008

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,9996	0,6722	0,9676	0,9829	0,8388	0,7570
OPRD	0,0004	0	0,0002	0,0722	0,0183	0,0011	0,0006
WC	0,3278	0,9998	0	0,9915	0,3604	0,7799	0,6307
MW	0,0324	0,9278	0,0085	0	0,3515	0,0356	0,0283
N	0,0171	0,9817	0,6396	0,6485	0	0,0713	0,0426
NE	0,1612	0,9989	0,2201	0,9644	0,9287	0	0,3332
EC	0,2430	0,9994	0,3693	0,9717	0,9574	0,6668	0

Source: Author's elaboration

In the period 2006-2008, the policy interventions seem to be concentrated on the Outer PRD. From the test of stochastic dominance, results show that the Outer PRD has a level of interventions greater than in all the other six areas (Table 5.6). The Middle West has instead more interventions than the Inner PRD, the West Coast, the North East and the East Coast. Finally, the North area records levels of interventions higher than the Inner PRD, the North East and the East Coast (p-value = 0.0171, p-value = 0.0713, p-value = 0.0426). In all other cases tests have not returned significant differences in terms of intensity of interventions. In the ranks derived from the combination of the p-values results show that the Outer PRD is

the area with the most extensive policy intervention of Guangdong. It is followed by Middle West, North, North East, East Coast, West Coast, and finally Inner PRD.

Figure 5.4. Policy 2003-2005: relative intensity vs. comparative homogeneity
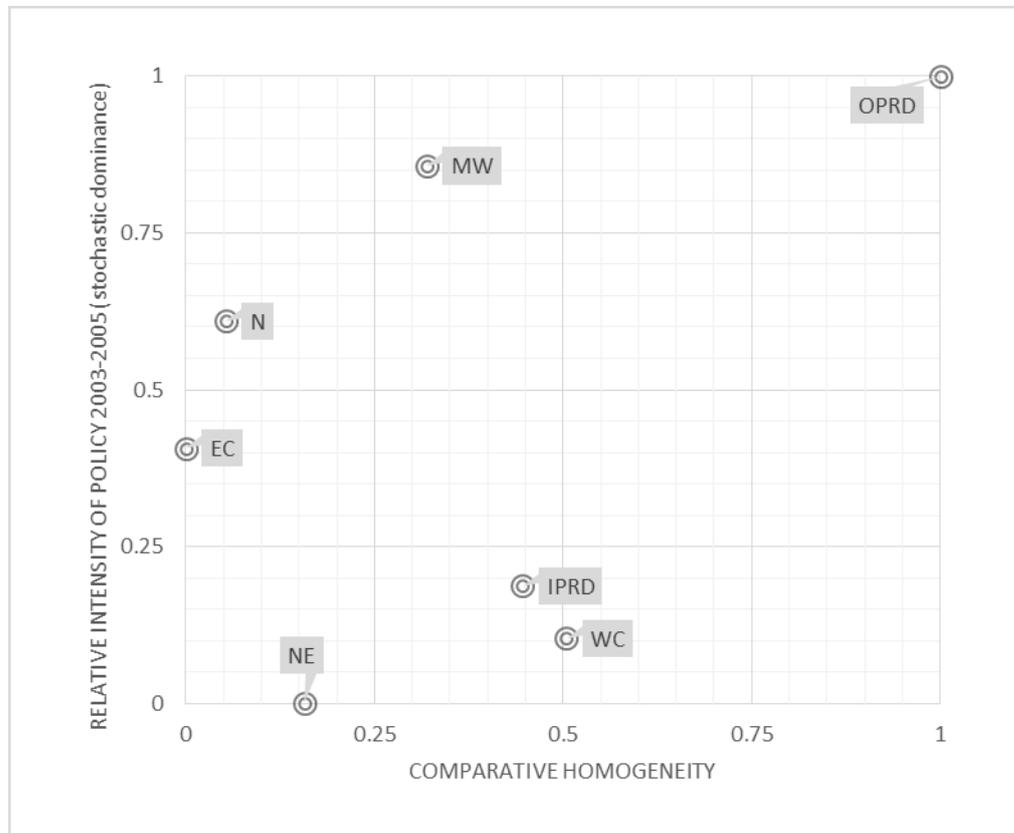
With regard to the distribution of policy interventions, pairwise tests of heterogeneity performed on the seven areas in the Inner PRD show that the policies are spread more evenly than in the North, North East, and East Coast (Table 5.7). The same thing happens to the Outer PRD and West Coast that have interventions distributed more evenly than in the North, North East and East Coast.

Once the indices of comparative homogeneity have been calculated, results show, however, that the Outer PRD is the area with the greatest homogeneity, followed by the Inner PRD, from the West Coast, Middle West, East Coast, North and North East.

Table 5.7. Matrix of the p-value of the directional test of heterogeneity (row vs. Column) on the pairwise comparisons of sub-areas: Policy 2006-2008

	IPRD	OPRD	WC	MW	N	NE	EC
IPRD	0	0,4840	0,5294	0,7774	0,9431	0,9626	0,9097
OPRD	0,5160	0	0,5484	0,8164	0,9780	0,9775	0,9611
WC	0,4706	0,4516	0	0,7525	0,9446	0,9601	0,9266
MW	0,2226	0,1836	0,2475	0	0,7854	0,8034	0,6936
N	0,0569	0,0220	0,0554	0,2146	0	0,6213	0,4007
NE	0,0374	0,0225	0,0399	0,1966	0,3787	0	0,3144
EC	0,0903	0,0389	0,0734	0,3064	0,5993	0,6856	0

Source: Author's elaboration

Figure 5.5. Policy 2006-2008: relative intensity vs. comparative homogeneity
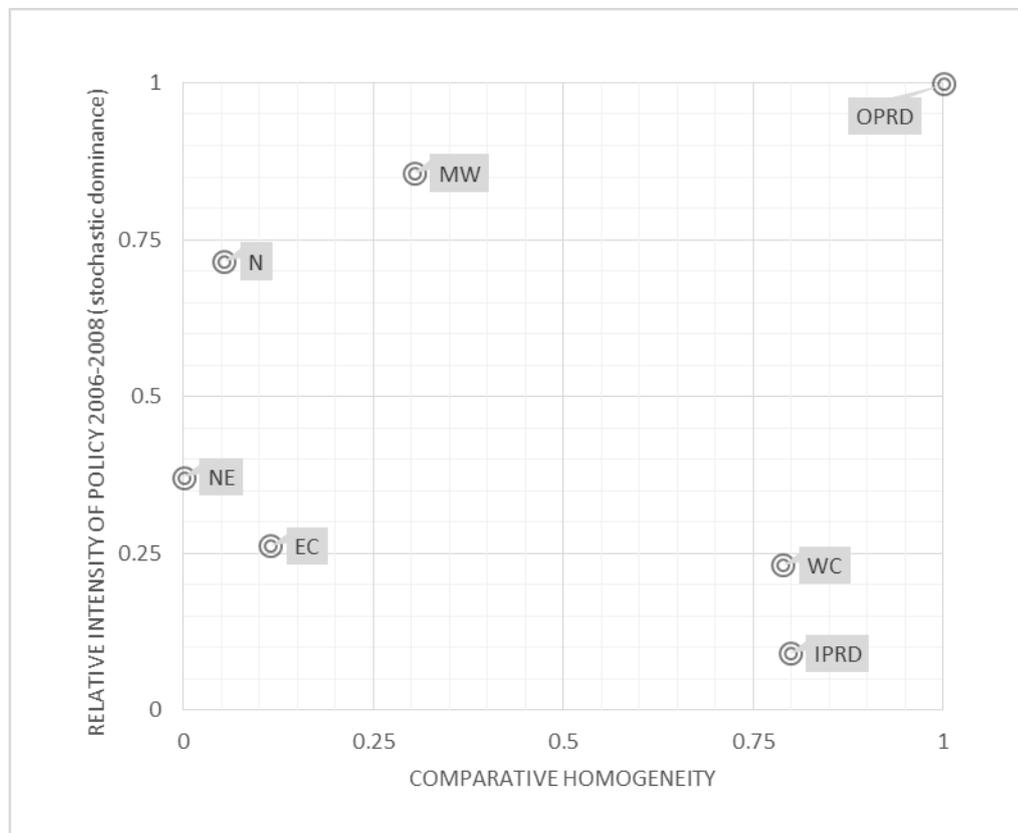
What emerges then (Figure 5.5), is that in 2006-2008 the Outer PRD is the area where there is the highest intensity of interventions that are distributed very uniformly. Compared to the previous three years, the interventions decrease in the Inner PRD. The area is in fact affected by fewer interventions which, however, are distributed in a homogeneous way. In the North East the interventions increase but,

they are unequally distributed. The North East in fact loses homogeneity compared to the 2003-2005 period and becomes the most heterogeneous of the region.

5.5 COMMENTS ON THE RESULTS

What emerges from this analysis is that Guangdong is an area that shows significant differences both in terms of performance and in terms of distribution of policy interventions.

In the first phase of the analysis (two areas) results show that the central area of the PRD is different from the rest of Guangdong, since it presents the highest performance but is also most homogeneously distributed within the territory.

In the second phase of the analysis (seven areas), with regard to performance, the Outer PRD contaminates the homogeneity of the PRD which had emerged in the previous phase; the Inner PRD alone is more homogeneous compared to all other areas, including the Outer PRD. The core of the Pearl River Delta, the Inner-PRD, has performance distributed uniformly in all counties and districts. The areas instead, in which there are lower levels of performance are those of the North and North East. In these areas, the low performances are distributed in an normally homogeneous way.

For policy interventions going from the 2003-2005 period to the 2006-2008 period it is possible to notice some changes both in terms of intensity of policy intervention and by their geographical distribution. The Outer PRD remains the area with the greatest consistency and the highest level of intervention. The Inner PRD loses instead, in terms of intensity, while it slightly improves in terms of homogeneity. In the North East the intensity of intervention increases.

The decrease of interventions in the Inner PRD and the corresponding increase in North East seem to confirm an actual movement of the interventions from the "center" to the "periphery" as desired by policy makers with the objective of rebalancing territorial inequalities (OECD, 2010; Di Tommaso, Rubini & Barbieri,

2013; World Bank, 2011; Wang, 2007). However, it seems that this is happening in ununiformed manner, since the interventions in these areas are distributed unevenly. Moving from the first to the second period in fact, the North East loses in terms of homogeneity of interventions becoming the most heterogeneous area of the region.

Finally, the results of this study seem to finally show a correspondence between performance and intensity of the policy intervention. Excluding the Inner PRD (Figure 5.6 and Figure 5.7), which shows high performance despite the low policy intervention that is recorded in both the three-year periods, the Outer PRD and Middle West show performances on average high with an intensity of interventions that are higher than in all other areas. In contrast, the North East, which until 2005 was the area that received the lowest level of intervention, shows very low performance. Another exception should be made instead for the coastal areas, West Coast and East Coast, which do not have a high intensity of interventions in both three-year periods, but show moderately high performance.

In conclusion, this study helps to document how this Chinese Province continues to grow while living with the dualism between center and periphery (PRD vs. non-PRD) that had characterized the first phase of industrial development begun in the late 1970s during the era of reform and opening to the market (OECD, 2010; World Bank, 2011; Di Tommaso, Rubini & Barbieri, 2013). The process of industrialization was incredibly intense and fast but it has not affected the entire province. The result is a heterogeneous geography of production, made up of territories that continue to be involved in the industrialization process in different ways and with different intensities.

Figure 5.6. Relative Intensity of Policy 2003-2005 vs. Intensity of Performance in 2008

The excessive congestion in the central areas and the marginalization of many peripheral areas are continuing to characterize the pattern of industrial growth of this area of China. Nevertheless, as shown here, this region depicts an image of industrialization that does not end in the inequality of center-periphery. Rather, it highlights a number of differences between territories. Differences that policy makers in government would like to reduce or at least try to rationalize. In fact, the industrial policy measures aimed at territorial balance have long been announced, included in the planning and tested.

These interventions, however, as is clear from this analysis, seem to be heterogeneously distributed in the area and that have shown an overall failure to reduce the differences. In this scenario, it seems that there is still a lot of work needs to be done and that the social sustainability of a process of territorially unbalanced industrial growth remains one of the uncertainties of the future.

Figure 5.7. Relative Intensity of Policy 2006-2008 vs. Intensity of Performance in 2008
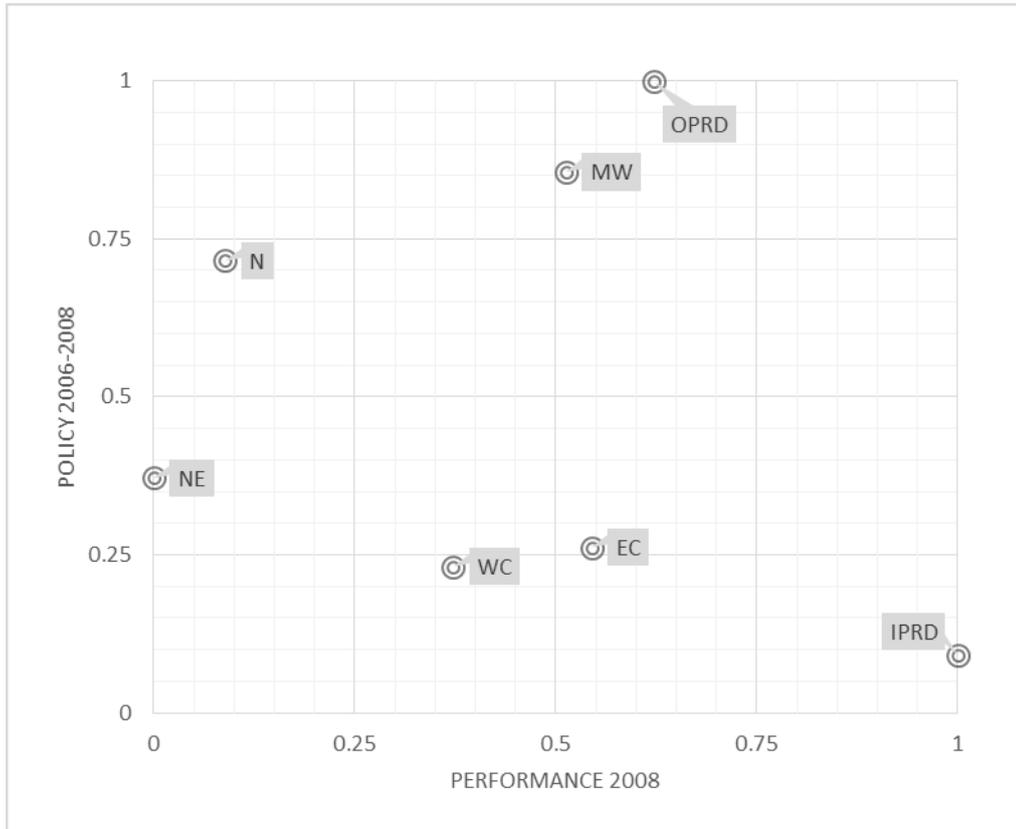
5.6 FINAL REMARKS

This analysis of Guangdong depicts a clear image of dualisms and unbalances that characterize this province in terms of both performances and intensity of policy intervention. The territory seems to have developed at different speeds and some areas have been left behind. Furthermore, policy makers are trying to recover from this unbalanced situation by concentrating policy efforts in the most depressed areas of the province.

The study of territorial unbalances in Chinese industrialization process continues with the analysis of Dongguan prefecture. It is located in the PRD, the most industrialized area of Guangdong. The aim here is to zoom in the local dimension and analyze territorial unbalances at town level.

6 DEVELOPMENT AND INDUSTRIALIZATION: A TOWN-LEVEL ANALYSIS IN DONGGUAN

6.1 OVERVIEW OF THE TERRITORY

Dongguan is geographically located in the middle section of the Guangzhou-Shenzhen economic corridor in the Pearl River Delta of Southern China (Figure 6.1). It is located 60km south of Guangzhou and 97km North of Shenzhen.

Figure 6.1. Dongguan location
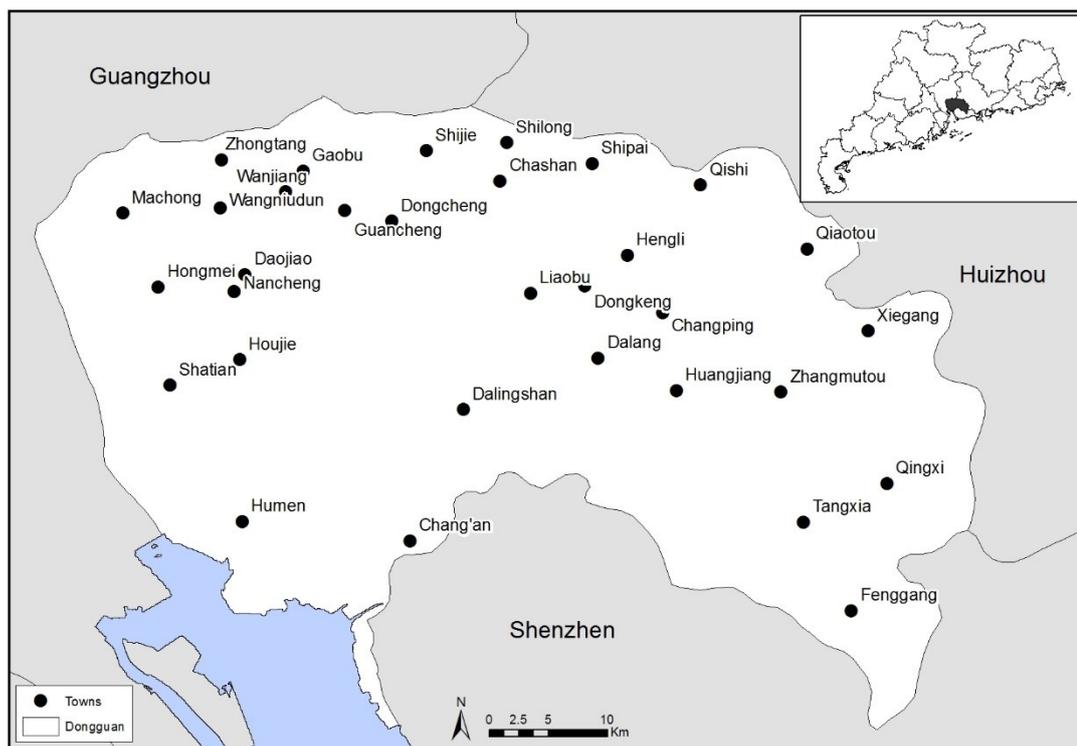
Dongguan has a long history since its first populations started to inhabit the coastal areas more than a thousand years ago. Its historical background contains several notable episodes, the most important of which is the destruction of 1.4 thousand tons of British opium in 1839, which triggered the first Opium War against Britain. This war led eventually to the cession of Hong Kong to Britain.

After the establishment of the People's Republic of China in 1949, Dongguan was governed by Dongguan County Revolutionary Committee before the formal establishment of the Dongguan county government in July 1980. In 1985, the city was promoted by the State Council to become a county-grade city under the jurisdiction of Huiyang and was included in the Pearl River Delta Economic Area. Finally in 1988, it was promoted to be a prefecture city under the jurisdiction of Guangdong Province. Unlike most of the prefecture level cities in China, Dongguan does not have any county level administrative units. The original Dongguan area was divided into 32 administrative towns within its 2,465 km^2. Guancheng is the political and economic center of Dongguan. The other thirty two towns administrate 587 administrative regions (Yeung, 2001).

During the Mao era, Dongguan experienced a long period of decline in terms of growth followed by a slow recovery by the early 1970s, when the relative political stability at the end of the Cultural Revolution brought to a continuous positive annual growth in all sectors of industrial and agricultural production.

Before the reform of 1978, most of the towns based their economies on farming and fishing while manufacturing activities were almost non-existent. The population of 400,000 was far from being one of the poorest in China although it was not very prosperous (Yang, 2006).

After the Open Door Policy in 1978, Dongguan became an export-oriented manufacturing based economy through processing and assembling-induced industrialization. During the first stage of the economic reform up to the late 1980s, it also became an outward-oriented commercial agriculture. In the late 1980s, Dongguan invested greatly in the construction and improvement of infrastructure; especially, in transportation, power supplies, and telecommunications (Yeung, 2001). These investments increased the attractiveness of Dongguan to larger-scale foreign investment.

In the second phase of the reform Dongguan focused on higher value-added and higher technology productions and increasingly supported the service sector especially since the mid-1990s. The result was that the GDP and per capita GDP growth rates increased dramatically each year reaching between 1978 and 1997 an

average annual growth rate of 14% for GDP and 13% for per capita GDP (Yeung, 2001a). The highest annual growth rate in GDP and per capita GDP was recorded in 1990, right after the events of Tiananmen Square.

Dongguan today has a population of nearly 7 million (Table 6.1), 5 million of which are migrants working in the thousands of firms spread all over the prefecture (Yang, 2006).

Firms produce any kind of product in huge volumes and that is the reason why Dongguan has been labeled as the world's factory (Yang, 2007; Gill & Kharas, 2007).

Dongguan is defined as one the "Four Little Tigers" of Guangdong Province together with the municipalities of Zhongshan, Shunde and Nanhai, because they have been the fastest growing cities in the Pearl River Delta after the implementation of the Open Door Policy (Eng, 1997; Yeung, 2001). Dongguan's GDP has grown at an annual average rate of 17% between 1981 and 1991 and about 20% in the last two decades (Fitzgerald, 1995; Yeung, 2001; Gill & Kharas, 2007). In 2008, GDP was about 370 billion RMB contributing 10% to the regional total and ranking fourth among the prefectures of Guangdong. Per capita GDP was above 53,000 RMB (Table 6.1).

Table 6.1. Main Socio-Economic Indicators for Dongguan

	DONGGUAN	GUANGDONG	% OF GUANGDONG
Population	6,949,800	95,440,900	7%
Area (sq.km)	2,465	179,813	1%
GDP (million RMB)	370,253	3,569,646	10%
Per capita GDP (RMB)	53,285	37,589	
Gross Output value of Industry ADS (million RMB)	663,282	6,542,461	10%
Number of enterprises	5,954	52,603	11%
Actualized Foreign Investment (million USD)	2,447	19,167	13%
Exports (million USD)	65,642	404,188	16%

Source: Author's elaboration on Guangdong Statistical Yearbook (2009)

Dongguan's economy is now mainly based on the tertiary and secondary sectors while the primary industry seems to have almost disappeared (Figure 6.2). Dongguan is now heavily based on telecommunications equipment (OECD, 2010). Textile is also very important for Dongguan's economy together with the production of furniture, paper making, food processing, beverage, and electrical machinery. Furthermore, it is worth noting that Dongguan provides about 30% of the regional output in paper making and 22% of the provincial total in both furniture and beverage (Table 6.2).

From 1978 to 1991, the local governments located in Dongguan collected over 2 billion USD for processing fees and land use from enterprises subcontracting from abroad and from foreign investors. These are the main source of local government revenue that the local government invested in transportation, energy, communication and land formation for plant site construction (Eng, 1997).

Thus, seeing the rapid economic growth driven by export-oriented foreign investments, in literature this phenomenon has been defined as "Dongguan Model" (Yeung, 2001; Yang, 2006).

Figure 6.2. GDP by sector of industry in Dongguan's towns in 2008

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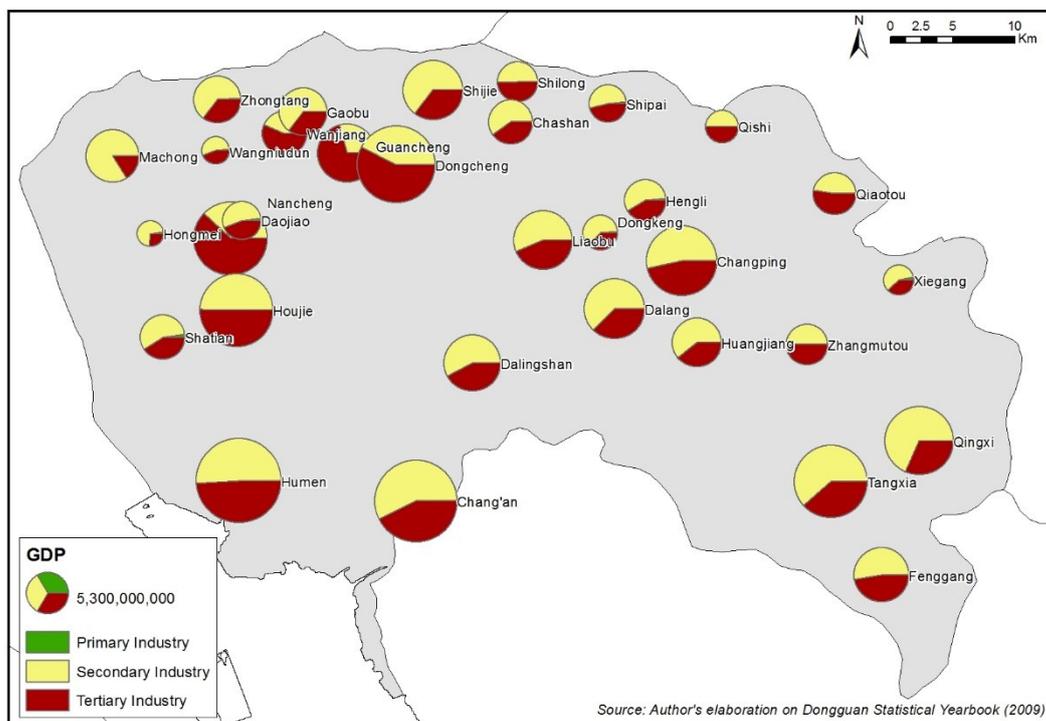
Table 6.2. Gross Output Value of Industry Above Designated Size of Dongguan

	Gross Output Value of Industry ADS (100 million RMB)	% of provincial total	% of prefecture total
Processing of Farm and Sideline Food	200.53	13%	3%
Food	60	8%	1%
Beverage	107.89	22%	2%
Textile	226.69	13%	3%
Textile Garments, Footwear and Headgear	232.24	13%	4%
Leather, Fur, Feather, Down and Related Products	190.81	16%	3%
Furniture	180.53	22%	3%
Papermaking and Paper Products	401.47	30%	6%
Cultural, Educational and Sports Articles	173.04	20%	3%
Rubber Products	57.94	18%	1%
Plastic Products	344.88	14%	5%
Electrical Machinery and Equipment	731.46	10%	11%
Communication Equipment, Computers and Other Electronic Equipment	1773.74	12%	27%
Instruments, Meters and Machinery for Cultural and Office Use	232.3	17%	4%

Source: Author's elaboration on Guangdong Statistical Yearbook (2009)

6.2 INDUSTRIAL DEVELOPMENT IN THE REGION

6.2.1 FDIs and Exports

In the last few decades the decentralization of the upper level government to the town-level government and the particular institutional setting in Dongguan have provided the towns with a great amount of incentives and high autonomy aimed especially at the attraction of foreign investors (Yang & Liao, 2010). Thus, manufacturing activities are found to be concentrated in small geographic regions such as the towns.

The major sources of foreign investment inflows are Hong Kong and Taiwan which contributed for 51% between 1979 and 2003. Japan, United States, and the European Union accounted for only about a quarter. In 2003, although Dongguan's

share of China's GDP was 0.8%, its actualized HK and TW investments accounted for 6.3 and 7.8%, respectively in the national total. In 2005, the number of TW and HK industrial enterprises in Dongguan ranked the first among the 21 cities in Guangdong. Thus, Dongguan's growth has been generated through its links with the regional and global economy (Yang, 2007; Yang & Liao, 2010).

In the late 1980s and early 1990s, both the Hong Kong and Taiwanese investments in Dongguan were characterized by export-oriented and labor intensive manufacturing sectors such as toys, footwear, and textiles. In the late 1990s, some differences started to emerge. Taiwanese investments started to focus on communications and computer-related electronic equipment while Hong Kong remained concentrated on plastics, textile and apparel production (Yang, 2006). Apparently, since the early 2000s Taiwanese investments have accelerated and passed the Hong Kong investments, thus becoming the major driving force for the region's economic development.

The development of electronics and furniture clusters would not have occurred without the involvement of and investment by Taiwanese firms. Similarly, firms in Hong Kong (China) have been instrumental in the growth of the apparel and toy clusters. Hong Kong and Taiwan invested firms tend to demonstrate different paths of sectorial transformations. Although both Hong Kong and Taiwan investments focused on labor-intensive sectors such as textile and footwear, Taiwan investment has shifted towards computer and electronic communication industries since the mid-1990s (Yang & Liao, 2010). More important than the financial investment made by foreign firms - a total of over US$15 billion in the last two decades - has been the technical know-how, knowledge of the market, and relations with customers that these firms have provided. The result is that, in 2004, Dongguan's exports totaled over US$35 billion. Imports, mostly parts and components from other countries in East Asia, were nearly US$30 billion (Gill & Kharas, 2007). In 1998, Dongguan became the third largest city in China in terms of the value of exports (after Shanghai and Shenzhen) (Yang, 2006).

Figure 6.3. FDIs in Dongguan's towns

Source: Author's elaboration on Dongguan Statistical Yearbook (2009)

Dongguan is not only a global processing and manufacturing base, but also an important export base (Yang, 2007). Many of its electronics products (including PCs and peripherals, electronic displays, LCDs, CPUs, scanners, keyboards, etc.) reach the rest of the world, making this area one of the biggest exporter of drives, scanners, and keyboards. International computer companies are more and more considering Dongguan as a sourcing base.

During the Maoist era in the 1960s, the export value had an intense slowdown due to the political and economic atmosphere that was governing China at that time. Even though the statistics regarding this period do not give full information, it is believed that agricultural products and traditional products contributed to 30% of average annual export growth rate and favored an increase in export by 53% between 1955 and 1977.

Figure 6.4. Exports in Dongguan's Towns
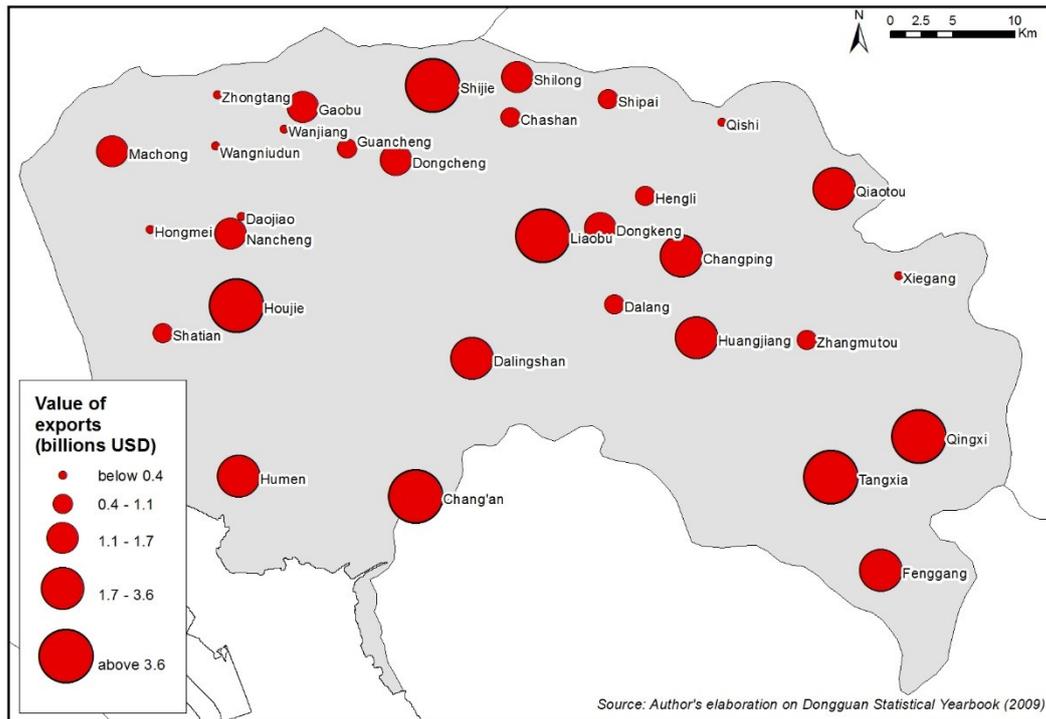
6.2.2 Specialized Towns

In the initial stages of development Dongguan has been greatly favored by its location and factor prices. As already mentioned, in the first decade after the opening-up of China investors from Hong Kong and Taiwan established their businesses in Dongguan. Small and medium enterprises started to flourish and a great amount of manufacturing operations were carried out in this area. Investors were mainly attracted by Dongguan's proximity to their homeland, and the plentiful availability of cheap land and the abundance of inexpensive workforce. Furthermore, the location of plants was usually chosen according to the incentives offered by individual town or administrator (Yang, 2007).

Dongguan's rapid growth during the 1990s seems to be attributed to the use of economies of scale in the production of intermediate goods and differentiated products, thus generating agglomeration effects within industries. Knowledge spillovers and lower logistics costs resulted from the advantage of being located

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close to input suppliers and export traders. This in turn resulted in the development of industry clusters of global importance, in particular in the production of knitwear, footwear, furniture, and toys. Furthermore, since the mid-1990s, the telecommunication cluster has dominated Dongguan's industrial landscape. About 95% of the components used for the manufacture of a personal computer were produced within Dongguan's borders. In addition, for several products Dongguan's factories were producing about 40% of the global production (Gill & Kharas, 2007).

Figure 6.5. Specialized Towns in Dongguan in 2008
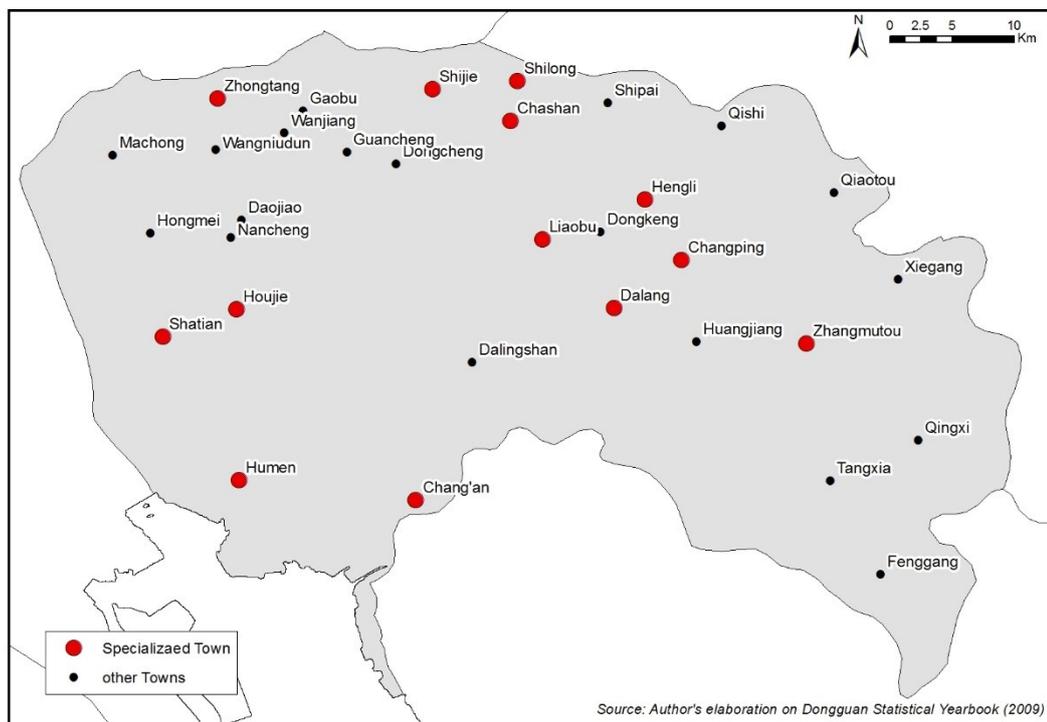
The launch of the program of the Specialized Towns gave an institutional setting to the phenomenon already in progress. In 2008, 13 of the 32 towns of Dongguan have been identified as specialized towns. They are spread all over the area of Dongguan (Figure 6.5) and they are specialized mainly in logistics and electronics, but also in business services, textile and garments, papermaking, food, furniture, optical digital products, and molds (Table 6.3).

Hence, for instance, clustering of the garment manufacturing activities in Dongguan have made Humen develop into a national wholesale center for garments and

textiles while Qingxi (acknowledged as specialized town in 2012) has become a point of reference in computer production for the whole China (Yang & Liao, 2010).

Evidence show that foreign investments especially from Hong Kong and Taiwan go hand in hand with the development of the specialized towns and the phenomenon of agglomerations (Yang & Liao, 2010).

Table 6.3. List of Specialized Towns in Dongguan up to 2008

TOWNS	SPECIALIZATION	YEAR OF ESTABLISHMENT
Zhangmutou	Business services	2005
Changping	Logistics	2001
Shatian	Port logistics	2007
Chashan	Food	2008
Zhongtang	Papermaking	2005
Dalang	Knitwear	2003
Humen	Garments	2002
Houjie	Furniture	2001
Liaobu	Optical digital products	2007
Chang'an	Electronic hardware	2002
Shilong	Electronic information	2000
Shijie	Electronics	2001
Hengli	Molds/dies	2008

Source: Author's elaboration on Association of Specialized Towns of Guangdong Province (2011)

6.2.3 Side effects in Dongguan's industrialization process

The growth and structural transformation of the magnitude and at the pace experienced by Dongguan has created side effects that need to be managed. Growth in manufacturing is intensive in infrastructure and resources. Dongguan's annual consumption of electricity and water in 2004, 35.2 billion kilowatt hours and 1.5 billion cubic meters respectively, has exceeded that of many countries. The conversion of land to industrial use is putting stresses on the environment. In 2004, Dongguan discharged 225 million tons of industrial waste water, nearly 200,000 tons of sulfur dioxide emissions, and nearly 30,000 tons of solid industrial wastes.

Agglomeration may lead eventually to congestion. Land is no longer as cheap in Dongguan as it once was, and labor is no longer as accommodating or as easily available. Shortages of labor, especially skilled labor, are being reported with increasing frequency. It is not only the physical landscape that is transformed (Gill & Kharas, 2007).

Growth may also fundamentally alter the social fabric and institutional foundations of governance. The drive to capture profits and economic rents associated with scale economies, while central in attracting investment, ideas, and contacts, may also engender corruption and crime. Dongguan in the 1990s was often described as having the atmosphere of a frontier gold-rush city. No direct statistics are available, but according to Gill & Kharas (2007) media accounts and case-based research suggest that corruption was common, whether in acquiring land for construction of factories or in facilitating the evasion of taxes and labor and environmental standards. Crime rates were higher than in other parts of China. And the uneven distribution of the economic surpluses generated by the growth - attributable partly to market-based incentives that reward individual effort, but also partly to uneven influence - has led to large disparities in income, itself a possible source of social tension. Household surveys indicate that the average per capita income among Dongguan's 1.6 million registered urban residents was 20,564 RMB in 2004. Successful local entrepreneurs whose incomes were unlikely to have been captured in the households surveys undoubtedly earned much more. A typical migrant worker in Dongguan's factories, on the other hand, earned less than 10,000 Yuan working much longer hours with fewer protections and much less access to public services (Gill & Kharas, 2007).

Finally, what makes the Dongguan story particularly interesting, however, is the extent to which the city has been striving to address these challenges. Environmental and labor standards are increasingly being enforced: in 2004, 90 percent of the industrial waste water in Dongguan met discharge standards, as did 86 percent of the solid wastes, and 93 percent of sulfur dioxide emissions met emissions standards. Through the Labor Bureau, Dongguan is trying to ensure the protection of worker rights and facilitate worker-firm matches. And the city is investing its sizable revenues from land rents and local taxes - over 1 billion USD

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in 2004 - in relieving congestion and improving infrastructure such as roads, port facilities, and industrial parks (Gill & Kharas, 2007).

6.3 FINAL REMARKS

Since the opening up of China, Dongguan has demonstrated to have the characteristics for a rapid and continuous process of industrialization. Due to its geographic location and institutional factors it has always been favored by investors. Its process of industrialization has resulted into some side effects that the local government has tried to solve. The following analysis will give further evidence of the high level and balanced distribution of performances that now characterize the towns of this prefecture.

7 CASE STUDY: DONGGUAN AS A MODEL OF DEVELOPMENT

7.1 OBJECTIVE: ASSESSMENT OF INEQUALITIES

In the chapter 5 the existence of deep inequalities among territories of Guangdong was assessed. The industrial policies and planning that have characterized the country and in particular this region have resulted in inefficiencies in distributing wealth and services on the whole territory.

On the other hand, it appears that, an area that has always been interested by industrial policies and has been helped by its geographic location is now the most industrialized with very high performances that are more homogeneously distributed on the territory with respect to the other areas considered. This is the case of the Inner Pearl River Delta.

The idea behind this following paragraph it to try to find some more evidence of the real existence of areas developed and industrialized in a homogeneous way. With this in mind, the analysis focuses on the case of the prefecture of Dongguan which is located in the Inner Pearl River Delta and is considered one the manufacturing hubs in the world. Goods leave this place to reach the rest of the world. This prefecture is widely considered one of the manufacturers of the world.

Despite the importance of this area in the economic development of the whole region (and country), only a small amount of research has been conducted in Dongguan, especially at the town-level. Most of the literature dedicated to the case of Dongguan, consists of Chinese official internal reports, which are not accessible to the public. Furthermore, the literature in English is mainly focused on FDIs (Yeung, 2001a, 2001b; Yang, 2006, 2007; Yu & Wong, 2011; Yang & Liao, 2010).

Hence in this case study, the aim is to test the findings of the previous analysis; namely that a process of industrialization terribly intense and fast has also created

areas in which inequalities do not represent reason of concern, because of strong economic performances homogeneously spread on the territory.

In this case the study focuses only on economic performances. This is because of two main reasons. First, the data available do not permit to calculate an index of policy intervention analogous to the one in the previous section. Second, the aim here is to test the hypothesis of homogeneous performances rather than policies.

In order to do so, the unit of analysis in this case is the towns of Dongguan Prefecture. They are divided in two groups according to their closeness or remoteness to features that have favored development. On the one hand, the first group (henceforth «PHR») consists of 21 towns that are located within 3 kilometers from a Highway and/or a Railway and/or in which there is a Port[31]. The second group (from now on «non-PHR») consists of the remaining 11 towns that are not located close to the main transport infrastructures[32] (Figure 7.1). The decision of taking into consideration the closeness to highways, railways and ports comes from the awareness that transportation plays a great role in development. This factor is found to be one of the causes of high and rising spatial disparities, especially in China (Fan, Kanbur & Zhang, 2009). In the last two decades, transportations in Dongguan were among the main recipients of investments aimed at the improvement of connections to Hong Kong, Shenzhen, and Guangzhou. The roads of Dongguan were transformed from narrow and rough to highways connecting most of the 32 towns of Dongguan to the rest of the province and Hong Kong. The most significant improvement was the construction of the Guangzhou-Shenzhen Highway. More than 50km of highway passing through ten different towns of Dongguan connect Guangzhou, Shenzhen, Zhuhai, and Hong Kong through the Tiger Gate Bridge (Yeung, 2001).

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[31] The towns falling in the first group are Humen, Chang'an, Shatian, Houjie, Daojiao, Nacheng, Wangniudun, Wanjiang, Gaobu, Machong, Guancheng, Dongcheng, Shijie, Chashan, Shilong, Hengli, Changping, Huangjiang, Zhangmutou, Xiegang, and Tangxia.

[32] The towns that are located far from the main means of transportation are Hongmei, Dalingshan, Zhongtang, Shipai, Liaobu, Dongkeng, Dalang, Qishi, Qiaotu, Qingxi, and Fenggang.

Figure 7.1. Towns in Dongguan
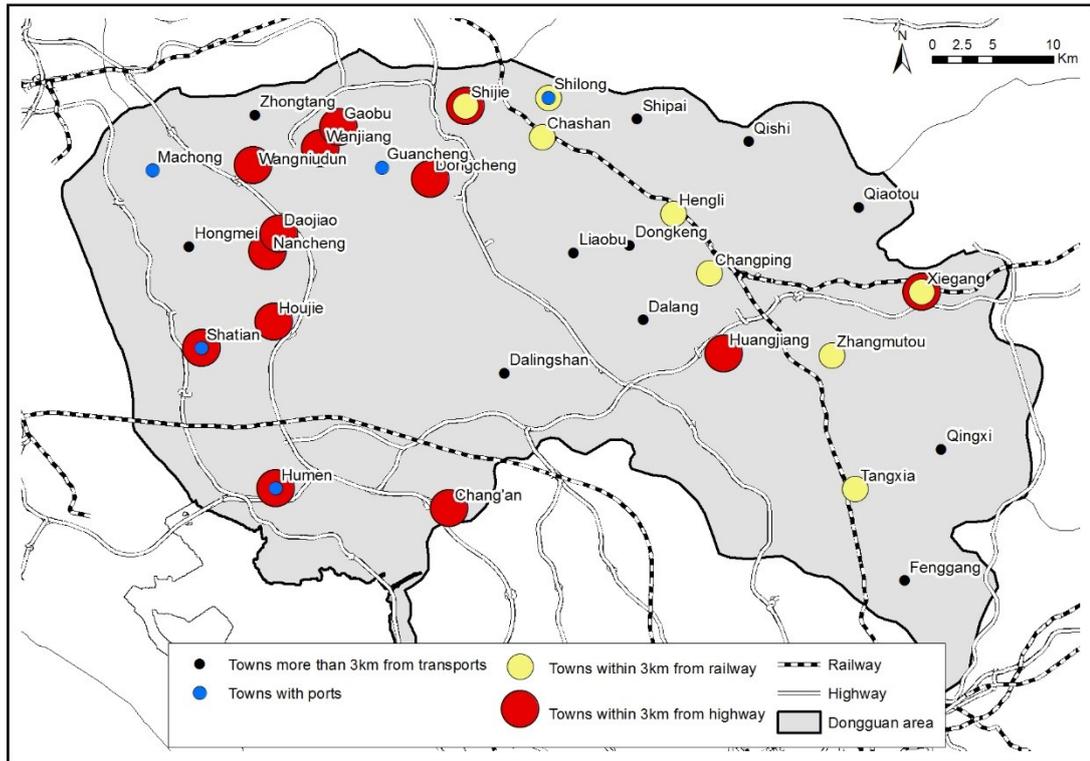
Source: Author's elaboration

Through the 1990s, roads were used more frequently than railways and waterways to transport cargos. This means of transportation was found to be more convenient due to the fact that cargo trucks were able to provide a door to door delivery service with no need of transshipment. Hence, this was considered as more efficient than the water and rail routes. Furthermore, until the end of the 1990s, the development of railways was rather fragmentary and the five major ports located in Dongguan acted only as a support to cargo and passenger transportation (Yeung, 2001).

In the last few years, roads, rails, and waterways have played a growing role in the movement of Guangdong's outputs. Road networks are critical for the movement of raw materials, manufactured inputs to industries, for the shipment of outputs to logistics hubs, air cargo terminals, and coastal container ports located in Shenzhen, Guangzhou and Hong Kong. Ports also provide a substantive access to global markets, thus improving PRD's orientation to exports. Finally, rails still provide a limited contribution to the movement of outputs in and out of the region (OECD,

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2010). Nonetheless, Dongguan counts on the combined use of roads, railways, and ports.

As for the previous analysis relative to counties and districts of Guangdong, the aim is to confirm that this area, located in the Inner PRD, does not have differences among towns in the distribution of its high performances. Thus, the aim is to assess the existence of differences in the geographical distribution of economic performance recorded in 2008.

In order to do so, the two groups of towns are compared in terms of the level of performances through the use of stochastic dominance tests. The alternative hypothesis tested here is that the performances in «PHR» towns in 2008 were greater than in «non-PHR». According to the literature on this topic, closeness to the main means of transportation might have generated more benefits to «PHR» towns rather than to «non-PHR», thus creating disparities in the distribution of performances (Fan, Kanbur, Zhang, 2009; Yeung, 2001; OECD, 2010).

Once this hypothesis is tested, the analysis goes further with the heterogeneity test. In order to proceed with this test the towns of the prefecture are classified according to their levels of performance. As for the previous analysis (chap. 3 and chap. 5), towns are divided into four categories according to the value of the index, using quartiles as threshold values.

With the heterogeneity test, the analysis focuses on the study of the two areas in terms of homogeneity/heterogeneity. Also in this case, the aim is to test what was found in the previous analysis by county/district, namely the homogeneity of the areas of the Inner PRD. Thus, the hypothesis tested is that the heterogeneity of the two groups is significantly different from one another. On the other hand, the alternative hypothesis here is that the heterogeneity of the «PHR» towns is greater than that of the «non-PHR».

7.2 DESCRIPTION OF DATASET

The data included in the database were collected from the National Bureau of Statistics of China and in particular from Dongguan Statistical Yearbook 2009. The statistical unit corresponds to the administrative level of town. The database includes socio economic data for all the 32 towns of Dongguan in 2008. The variables used for this analysis are five and are the same used for the previous analysis by county/district.

7.3 METHODOLOGY

The case study on Dongguan approximately follows the steps that were previously covered for the analysis by county/district. Thus the formalization of the analysis will not be repeated in this paragraph. Here is a brief review of what has been done in this case:

1. *Index of Performance*. The creation of the Index of Performance. In order to do so, five variables were selected. As before, the variables used are density of enterprises, export, industrial output, per capita GDP and number of employed. They were normalized and combined using the Fisher's combining function and normalized again,

2. *Categories*. The towns of Dongguan were divided into four categories according to the value of the Index of Performance. In order to do so, the quartiles of the distribution of the total 32 towns were used as thresholds values. As before, "low" intensity corresponds to values below the first quartile, "medium-low" to a value between the first quartile and the median, "medium-high" correspond to values between the median and the third quartile and "high" values above the third quartile. The categorical variable follows therefore by definition a uniform distribution (and therefore it is maximally heterogeneous) because each category is observed with a percentage equal to 25%,

3. *Territorial groups of towns*. Definition of the two groups of towns according to their closeness/remoteness to the main means of transportation, namely ports,

highways and railways (see par. 7.1 for a detailed description of the two groups),

4. *Stochastic Dominance Test.* The analysis proceeds with the elaboration of the stochastic dominance test, making a comparison of the two groups, where the null hypothesis is that there is no significant difference between the two groups of towns, while the alternative hypothesis is that the performances of the «PHR» towns is greater than that of the «non-PHR» towns (see par. 5.3.3 for a detailed description of the stochastic dominance test),

5. *Heterogeneity Test.* In addition to the stochastic dominance test, the test of heterogeneity is applied to compare the two groups of towns in terms of distributions. The null hypothesis is that there is no significant difference in terms of heterogeneity between the two groups of towns, while the alternative hypothesis is that the heterogeneity of performances of the «PHR» towns is greater than that of the «non-PHR» towns (see par. 5.3.4 for a detailed description of the test).

7.4 RESULTS

From the test of stochastic dominance the findings show that there is not a significant difference between the two groups of towns (p-value = 0.1483). Thus, the performances of towns close to the main means of transportation does not show to be greater than that of the group of towns located further than 3km from highways, railways and ports.

As concerns the indices of heterogeneity, they indicate that both groups do not have particularly high levels of heterogeneity though the group of towns «PHR» has a greater index than that of the «non-PHR» (Table 7.1).

The test of heterogeneity that compares the two groups shows that the heterogeneity of the group «PHR» is not significantly different from the heterogeneity of the group «non-PHR» (p-value = 0.5254).

Table 7.1. Renyi's indices of heterogeneity normalized

	PHR	non-PHR
Renyi Index	0.7925	0.7297

Source: Author's elaboration

7.5 FINAL REMARKS

This analysis has shown that Dongguan is an area in which there are not significant inequalities in terms of performances. The performances of towns that could have benefited from their proximity to transport connections are instead very similar to those of the towns not as well connected.

These results confirm what emerged in the previous analysis; namely that the Inner PRD not only had higher performances compared to the other areas, but also had performances that were more homogeneous compared to the other areas. Thus, Dongguan, confirms the fact that the areas within the Inner PRD do not show an unbalanced distribution of performances.

This study concludes a path of analysis that had started with the investigation of territorial inequalities within China, then in Guangdong Province, and had followed with the assessment of inequalities within an area restricted to one prefecture. In the first step the analysis showed that the process of industrialization, though fast and intense, had not affected all the provinces. In the case of Guangdong, performances were not equally distributed in the entire province. The analysis had also showed that the Inner PRD was the only area in which industrialization had spread more homogeneously than in the other areas.

The findings of this last step of the analysis referring to Dongguan show this area within the Inner PRD has been affected by a high level of industrialization that has distributed on the territory in a homogeneous way. Thus, where industrialization

and the economic performances have been more intense, they are also better distributed.

CONCLUDING REMARKS

This work describe the image of a country, China, marked by a massive industrialization, continuous growth, and unprecedented development. This phenomenon has been accompanied by planning and programmes of development that have certainly favored certain sectors of the industry and specific geographic areas.

The theoretical framework described here shows that government's intervention is driven by its goals which can be categorized into three broad fields: resolving market failures, pursuing strategic economic objectives, and achieving meta-economic goals. As displayed by the study of the current theoretical debate, each national government has tried its own mix of policies trying to achieve one or more of these goals.

China is a case of significant economic growth, accompanied by heavy state intervention which was mainly focused on the achievement of strategic economic goals. China differs from traditional models of development since it has implemented its own strategies aimed at opening to rest of the world, favoring exports and FDIs. It has promoted strategic sectors, such as the high-tech industry, and it has protected national pillars such as the steel industry. The declared aim of these policies was to accelerate economic growth and foster industrialization.

Thus, these programmes have promoted industrialization leaving aside crucial topics connected to a broader dimension of development. Intense economic growth in the name of "getting rich first" produced side costs in terms of inequalities in several fields. Education, health, and wealth unbalances, among others, represent the main concerns of the government since they cannot be tolerated in the long run.

Territorial unbalances have been the focus of this work since I believe that the solution of this topic could assure to China a stable and continuous growth in the future. This topic has been studied at different levels. Starting from the national level, then going into the detail of the case of Guangdong province and ended with the analysis of Dongguan.

What emerged from the analysis at national level was that China has actually had a great industrial growth in terms of economic performances in the considered period (1998-2010). At the same time, this incredible growth has been accompanied by inequalities in the distribution of performances among Chinese provinces that have persisted almost unchanged for the whole period. Furthermore, most of the provinces seem to have low performances for the entire period. Only few of them have experienced high levels of economic performances and Guangdong, in particular, is the province with the highest level of performances for the entire period. Thus, the analysis at this level confirms a massive increase in economic performances in China in the last decade and shows deep inequalities that persist over time.

The analysis has continued with the study of inequalities in the case of the best performing province in China in terms of economic performances: Guangdong province. Guangdong is considered as an emblematic case because it combines all the characteristics of China: intense and continuous growth, strong industrialization, substantive government's intervention, promotion of strategic sectors, and long-term planning. All these elements are accompanied by the rise of side effects: environmental degradation and inequalities. Now the government is trying to address these issues through a re-shaping of planning and policies. The work proposed in this part has tried to assess the territorial unbalances that characterize the region, not only in terms of performances, but also in terms of policy intervention.

At this stage the analysis shows that in Guangdong the process of industrialization has not affected the entire province. The picture described by this study shows an unbalanced distribution of economic performances. Furthermore, the territories of

Guangdong are involved in the industrialization process at different intensities. Excessive congestion in PRD continues to foster the gap with the periphery.

Furthermore, Guangdong province shows a complex pattern of unbalances that cannot be synthetized with the center-periphery model. Apart from the dualism represented by PRD vs. non-PRD, this province shows internal differences among several areas. The territories of Guangdong are involved in the industrialization process at different intensities and growth in these areas seems to have different speeds.

Moreover, as concerns the distribution of industrial policies over the territory of Guangdong, the findings show that interventions are not equally distributed and do not seem to focus on the most depressed areas. Nonetheless, in the last decade the government has announced measures aimed at territorial rebalancing. Since the 11th Five-Year Plan they have been included in the planning. These interventions, however, as it is clear from the analysis, seem to be unequally distributed in the region.

The analysis in this work continues with the case of Dongguan. Since the opening up of China, Dongguan has showed a rapid and continuous process of industrialization. Due to its geographic location and institutional factors it has always been favored by investors and policies. This study has given further evidence of the high and equally distributed performances that now characterize the towns of this prefecture.

Dongguan appears to be an area in which performances are equally distributed at town level. The performances of towns that could have benefited from their proximity to transport connections are very similar to performances of the towns not as well connected. These results confirm an overall homogeneity in the distribution of performances within the Inner PRD.

This study concludes a path of analysis that, starting from the national level then going into the detail of towns, has shed light on territorial distribution of performances and policies.

The analysis returns the picture of a territory marked by strong territorial unbalances. Guangdong itself, which is one of the most industrialized provinces of China, presents a marked dualism between core and periphery, not only in terms of performances but also in terms of intensity of policies. Nevertheless, Dongguan's case demonstrates that strong industrialization not necessarily means inequalities.

In this scenario, a few considerations need to be highlighted.

First, the study of inequalities in China does not end with territorial imbalances, but needs further study on inequalities in the field of health, education, gender, opportunities, etc. The statistical method used in this work, through the use of indices of synthesis, is also appropriate for analysis using other dimensions such as education and health.

In addition, further analyses and understandings on the issue of territorial inequalities in China are certainly desirable and necessary. In the literature a more detailed analysis of the provinces is missing. Most of the studies either focus on coastal-inland inequalities or they focus on the rural-urban dualism. Some of them take into account regional inequalities, but do not consider inequalities within each region. (Barone, Bin, Brasili, & Fanfani, 2013; Chen & Fleischer, 1996; Fan & Sun, 2008; Fan, Kanbur, & Zhang, 2011; Fan, Kanbur, & Zhang, 2009; Gu, Shen, Wong, & Zhen, 2001; Liao & Wei, 2012; Wei & Fan, 2000). It is interesting to replicate the study and extend it to other areas of analysis, starting with other Chinese provinces, but also other countries and regions.

Another consideration that is necessary to make in conclusion of this work relates to policy implications. From the study presented in this work it appears that still a lot of efforts need to be made in order to rebalance the Chinese territory. Although the Chinese government has started to orient its policies towards priorities that deviate from the mere economic dimension, China still shows territorial unbalances.

So far, policies implemented by the government have demonstrated to be very effective in the areas where they were tested. However, now China is facing the biggest challenge. The dream of the "harmonious society" can only be reached

through further planning and specific policies aimed at those territories that have not yet enjoyed the benefits of growth.

The results brought by the analysis of the distribution of policy interventions in Guangdong clearly show that policy efforts need to be increased in the worst performing areas.

Thus, the social sustainability of the Chinese economic growth remains one of the priorities in the policy agenda. The government needs to increase the efforts in rebalancing the industrialization in the Chinese territory in order to enhance the diffusion of the benefits of economic growth and development in remote areas. Moreover, further reforms in the fields of education, health and labor are desirable in perspective of a socially sustainable growth in the long run.

APPENDIX: GUANGDONG ADMINISTRATIVE DIVISION AT COUNTY-DISTRICT LEVEL

PREFECTURE	AREA (KM2)	COUNTY-DISTRICT LEVEL	
		NAME	TYPOLOGY
Guangzhou (capital)	7,434	Guangzhou UA	Core municipality
		Conghua	County-level city
		Zengcheng	County-level city
		Yuexiu	Urban district
		Haizhu	Urban district
		Liwan	Urban district
		Tianhe	Urban district
		Baiyun	Suburban district
		Huangpu	Suburban district
		Luogang	Suburban district
		Huadu	Suburban district
		Nansha	Suburban district
		Panyu	Suburban district
Shenzhen	2,016	Shenzhen UA (SEZ)	Core municipality
		Futian (SEZ)	Urban district
		Luohu (SEZ)	Urban district
		Nanshan (SEZ)	Urban district
		Yantian (SEZ)	Urban district
		Bao'an	Suburban district
		Longgang	Suburban district
Foshan	3,883	Foshan UA	Core municipality
		Chancheng	Urban district
		Shunde	Suburban district
		Nanhai	Suburban district
		Sanshui	Suburban district
		Gaoming	Suburban district
Dongguan	2,520	Dongguan UA	Core municipality
Zhongshan	1,800	Zhongshan UA	Core municipality
Zhuhai	1,560	Zhuhai UA (SEZ)	Core municipality
		Xiangzhou (SEZ)	Urban district
		Doumen	Urban district

PREFECTURE	AREA (KM2)	COUNTY-DISTRICT LEVEL	
		NAME	TYPOLOGY
		Jinwan	Urban district
Huizhou	10,792	Huizhou UA	Core municipality
		Huicheng	Urban district
		Huiyang	Urban district
		Boluo	County
		Huidong	County
		Longmen	County
Zhaoqing	14,978	Zhaoqing UA	Core municipality
		Duanzhou	Urban district
		Dinghu	Urban district
		Gaoyao	County-level city
		Sihui	County-level city
		Guangning	County
		Deqing	County
		Fengkai	County
		Huaiji	County
Jiangmen	9,259	Jiangmen UA	Core municipality
		Pengjiang	Urban district
		Jianghai	Urban district
		Xinhui	Suburban district
		Taishan	County-level city
		Kaiping	County-level city
		Enping	County-level city
		Heshan	County-level city
Shantou	2,131	Shantou UA	Core municipality
		Nan'ao	County
		Jinping	Urban district
		Longhu	Urban district
		Haojiang	Urban district
		Chaoyang	Urban district
		Chaonan	Suburban district
		Chenghai	Suburban district
Shanwei	4,728	Shanwei UA	Core municipality
		Chengqu	Urban district
		Lufeng	County-level city
		Haifeng	County
		Luhe	County
Chaozhou	3,090	Chaozhou UA	Core municipality
		Xiangqiao	Urban district
		Chao'an	County

PREFECTURE	AREA (KM2)	COUNTY-DISTRICT LEVEL	
		NAME	TYPOLOGY
		Raoping	County
Jieyang	5,057	Jieyang UA	Core municipality
		Rongcheng	Urban district
		Jiedong	County
		Huilai	County
		Jiexi	County
		Puning	County-level city
Yangjiang	7,748	Yangjiang UA	Core municipality
		Jiangcheng	Urban district
		Yangdong	County
		Yangxi	County
		Yangchun	County-level city
Maoming	11,493	Maoming UA	Core municipality
		Maonan	Urban district
		Maogang	Urban district
		Dianbai	County
		Gaozhou	County-level city
		Huazhou	County-level city
		Xinyi	County-level city
Zhanjiang	11,517	Zhanjiang UA	Core municipality
		Chikan	Urban district
		Xiashan	Urban district
		Potou	Urban district
		Mazhang	Suburban district
		Xuwen	County
		Suixi	County
		Leizhou	County-level city
		Lianjiang	County-level city
		Wuchuan	County-level city
Shaoguan	18,900	Shaoguan UA	Core municipality
		Zhenjiang	Urban district
		Wujiang	Urban district
		Qujiang	Urban district
		Lechang	County-level city
		Nanxiong	County-level city
		RuyuanYao	County
		Renhua	County
		Shixing	County
		Wengyuan	County
		Xinfeng	County

PREFECTURE	AREA (KM2)	COUNTY-DISTRICT LEVEL	
		NAME	TYPOLOGY
Heyuan	15,440	Heyuan UA	Core municipality
		Yuancheng	Urban district
		Dongyuan	County
		Heping	County
		Longchuan	County
		Zijin	County
		Lianping	County
Meizhou	16,003	Meizhou UA	Core municipality
		Meijiang	Urban district
		Meixian	County
		Dapu	County
		Fengshun	County
		Wuhua	County
		Pingyuan	County
		Jiaoling	County
		Xingning	County-level city
Qingyuan	18,932	Qingyuan UA	Core municipality
		Qingcheng	Urban district
		Qingxin	County
		Fogang	County
		Yangshan	County
		Lianshan	County
		Liannan Yao	County
		Yingde	County-level city
		Lianzhou	County-level city
Yunfu	7,564	Yunfu UA	Core municipality
		Yuncheng	Urban district
		Xinxing	County
		Yu'nan	County
		Yun'an	County
		Luoding	County-level city

Source: Author's elaboration on OECD (2010), GBS (2012), and Di Tommaso et al. (2013)

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