Preferential Policies and Inequality in Urban China

by

Octasiano Miguel VALERIO MENDOZA

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Approved by the Dissertation Committee

Naoko SHINKAI (Chairperson)

Kiyoshi FUJIKAWA

Tetsuo UMEMURA

Approved by GSID Committee: March 6, 2017

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Graduate School of International Development
Nagoya University
Octasiano M. VALERIO MENDOZA

List of Abbreviations

BECZ	Border Economic and Cooperation Zone
BZ	Bounded Zone
CAD	Comparative Advantage Defying
CAF	Comparative Advantage Following
CASS	the Chinese Academy of Social Sciences
CHIP	China Household Income Project
CPI	Consumer Price Index
CV	Coefficient of Variance
DB	Di Bao (Minimum Income Guarantee System)
DZ	Development Zone
EDZ	Economic Development Zone
EJV	Equity Joint Venture
EPZ	Export Processing Zone
ETDZ	Economic and Technological Development Zone
FDI	Foreign Direct Investment
FIAS	Foreign Investment Advisory Service
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GE	Generalized Entropy
GMM	Generalized Method of Moments
HIDZ	High-Tech Industrial Development Zones
HOM	Heckscher-Ohlin Model
ILO	International Labor Organization

IP/IZ	Industrial Park/ Industrial Zone
IVA	Industrial Value Added
MLD	Mean Log Deviation
NBS	National Bureau of Statistics
OBC	Open Border City
OC	Open City
OCC	Open Coastal City
OECD	the Organization for Economic Co-operation and Development
OIC	Open Inland City
OLS	Ordinary Least Squares
ORC	Open Riverside City
PRC	the People's Republic of China
R&D	Research and Development
SAR	Special Administrative Region
SCM	Subsidies and Countervailing Measures
SDG	Sustainable Development Goal
SEA	Special Economic Area
SEZ	Special Economic Zone
SOE	State Owned Enterprise
TOTE	Terms of Trade Effect
TRIM	Trade Related Investment Measures
VAT	Value Added Tax
VOTE	Volume of Trade Effect
WAM	Working Age Member
WDR	World Development Report
WTO	World Trade Organization

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Chapter 1: Introduction

1.1 Background

In an effort to attract foreign direct investment (FDI), increase employment, and stimulate economic growth, many governments have permitted some demarcated zones, or even individual enterprises, to benefit from fiscal incentives and privileges, otherwise unavailable to the rest of the nation, by crafting and executing "preferential policies" as part of their development strategies. These preferential policies, which are usually more liberalized and progressive, have allowed their benefactors to gain a comparative advantage in local and global economies. Over the last half-century, preferential policies, mainly via export-processing zones (EPZs), have experienced varied degrees of success and failure. China's special economic zones (SEZs) are regarded as the most successful cases of preferential policy instruments leading to rapid economic growth.

While the term "SEZ" is used freely, referring to different types of zones, the SEZs in China have distinctively unique characteristics because these zones were created as experimental areas for economic reform and transition. Most zones around the world tend to be small in size and are specialized in one or more types of export-oriented economic activity, (such as export assembling and processing and manufacturing electronics), or promoting research and development (R&D) and technology transfer (industrial parks). In China, SEZs are larger in terms of scale (size of cities) and more comprehensive in terms of function (not just exports, but finance, welfare, labor, administrative, and others) serving as an innovative policy instrument for economic transition. Additionally, China has smaller scale "development zones" (DZs), found within cities, including SEZs, such as Economic and Technological Development Zones (ETDZs) and High-Tech Industrial Development Zones (HIDZs), among

others. These DZs represented different development strategies that were aimed at using fiscal incentives to gain high grade technological expertise and develop domestic technologies and industries.

These are two tiers of preferential policies in China. SEZs and Open Cities (OCs) have the highest level of autonomy. These sixty cities have citywide preferential status and are reform-oriented zones. They can experiment with different policies that cover a wide range of aspects such as markets, labor, finance, education, healthcare, welfare, and skills upgrading schemes. DZs, on the other hand, are not reform oriented. They have specific functions such as improving technological innovation or developing domestic industries. Not all cities followed the same DZ strategy. Many did not create a DZ at all, while some decided to specialize in one type of DZ and others implemented different types of DZs.

For over thirty years, the world has marveled at the fast pace of China's economic growth, acknowledging the role of preferential policies as a main driver of economic performance. However, China's rapid growth has been accompanied by rising income inequality. Within recent years, many countries have announced, or are already implementing, preferential policy programs into their development agendas (India, Indonesia, Cuba, Honduras, Costa Rica, Venezuela, Zambia, Mauritius, Ethiopia, Nigeria and Egypt). All of these programs are modeled after, or closely resemble, the Chinese (SEZs).[1] The pursuit of rapid economic growth through these preferential policy instruments might also lead higher income disparities. Given the widespread application of preferential policies, it is important to understand their impact on welfare.

Although there is plenty of research indicating that preferential policies promote economic growth, FDI, and employment, there are few studies measuring the relation, and

[1] India announced SEZ policy based on Chinese model in 2000 and implemented the "SEZ ACT 2005", refer to Leong (2007, p. 8); Japan has recently revitalized plans for implementing SEZs based on the Shenzhen model. (Soble, 2013; The Economist, 2013) China is involved in developing SEZs in Costa Rica (Bloomberg News, 2013), Venezuela and Africa. (Bräutigam & Xiaoyang, 2012). Honduras, on the other hand, has approved urbanization projects to build new cities based on Paul Romer's "Charter City" concept and the Shenzhen model. (Davidson, 2012; Romer, 2009, 2011)

contribution, to inequality. Conversely, research on inequality in China is vast and diverse, covering many perspectives, including spatial dimensions, which highlight the high contributions of geographical determinants to inequality, mainly in terms of regional (west, center, and east), provincial, and urban/rural disparities.

Currently, there are no studies examining income inequality through the perspective of citywide preferential policies. Whether or not preferential policies are conducive to balanced growth remains unexplored. Furthermore, inequality has become an important issue in recent years. It has been included as Goal 10 of the Post 2015 Sustainable Development Goals (SDGs) and there is a call to move from studying inequality of income towards a multidimensional measure which includes education, health, gender, ethnicity, and others. This dissertation aims at contributing towards this research gap in order to provide a more comprehensive understanding of the relationship between preferential policies and income inequality.

1.2 Research Questions and Objectives

The main research questions and objectives of this dissertation are as follows:

1. **What is the relationship between citywide preferential policies and income inequality in China's Special Economic Zones and Open Cities?**
    a. *Identify spatial differences relating to inequality of household disposable income per capita between cities with and without preferential policies in China.* By comparing inequality measures between the different types of cities, this dissertation will identify whether there is an inequality gap between these types of cities in Urban China, whether the gap is converging or diverging, and if the cities with preferential policies have higher or lower inequality measures

b. *Identify contributing factors to the different types of inequality.* Once the inequality gaps have been established, contributing factors to the inequalities of income, education, and health will be investigated.

2. **What is the relationship between different development zone strategies and income inequality in Urban China?**

   a. *Identify whether having a development zone (DZ) produces lower or higher income and income inequality in Chinese cities.* The establishment of DZs is not homogenous across cities. While some cities have chosen not to create a DZ, others have one or more. Investigating whether the number of zones has produced different income and inequality outcomes will be beneficial for policy implications in ascertaining an ideal number or range of DZs.

   b. *Establish whether the different types of DZs perform differently across regions.* Some cities have chosen only to have an ETDZ, or only an HIDZ, while other cities have chosen to create both. By identifying differences between these strategies, this chapter will uncover whether it is better to specialize or diversify development strategies across the different regions in China.

Each of these objectives will contribute to the research gaps in the areas of preferential policies and income inequality.

1.3 Data and Methodology

This dissertation uses the urban datasets from the China Household Income Project (CHIP) surveys from 1988 to 2013, which include over to 6,000 households and 20,000 individuals from 125 cities and 12 provinces. The CHIP survey questionnaires were explicitly designed to analyze household income in China. A distinctive feature of the CHIP surveys is that the data covers large parts of the country, which is suitable for spatial decompositions of

inequality.[2] The CHIP surveys have another advantage because they include migrants in this sample.[3] Most studies don't include rural migrants in urban areas that have rural Hukous[4] as urban residents. These migrants make less than residents with urban Hukous and, therefore, by disregarding them the urban-rural income gap is higher. Descriptions of the 1995 and 2002 CHIP surveys, along with key findings and analyses, can be found in the Appendix of Gustafsson, Li, and Sicular (2008). The datasets also cover the nessesary variables for analyses pertaining to inequalities of educational attainment.

The study measures inequality of household per capita income,[5] using different measures, for up to 125 cities. The inequality indices are then aggregated using population-based decomposition[6] to show the inequality between Cities with preferential policies and cities without. Regional decomposition is also applied separating the sample into West, Center, and East. Thus producing 6 comparative subsamples. (East with preferential policies, East without, and so on…)

Regression-based decomposition of inequality[7] is used to determine the factors contributing to inequality in cities with preferential policies and cities without preferential policies.

1.4 Significance of the Thesis

This thesis will achieve a better understanding of the intricacies of the Chinese model of preferential policies rooted in gradual reform and liberalization, which has been disregarded, or overlooked, in previous literature due to the lack of distinction between these cases and others

[2] Many studies use Urban-rural-regional weights to make the CHIP data nationally representable. This study does not use weights since it does not focus on the rural datasets and derives measures of inequality from the lowest level, the city district level.
[3] Migrants are included from 2002 survey onwards.
[4] Hukou is China's residential registration system.
[5] Detailed definition and components of income used are given in Chapters 4 and 5.
[6] See Gustafsson, Shi, & Sicular (2010). Methodology explained in Chapters 4 and 5.
[7] See Morduch & Sicular (2002). Methodology explained in Chapters 4.

world-wide, by carefully defining the structure, administration, scale and functions of these zones.

It will contribute to the literature gap regarding preferential policies, in the case of SEZs and OCs, by examining their impact on the distribution of income. Previous research mainly focus on the impact of SEZs and OCs on FDI, employment, and growth, but not inequality. Moreover, it contributes to the research of inequality in China, which already covers spatial decompositions on regional, provincial, and urban/rural levels, by extending this research to include the further decomposition of urban inequality through the viewpoint of cities with and without preferential policies.

The design of the two research questions was made for them to complement each other. The first research question will ascertain whether there are any differences between cities receiving citywide preferential policies and other cities. If there are no differences, then perhaps the differences lie in the varying DZ strategies. This scenario would prove that DZ strategies deserve further scrutiny than SEZ/OCs. On the other hand, a failure to uncover differences under both tiers of preferential policies would serve as a robustness test indicating that there are no visible gaps between the preferential treatments. However, if the first research question yields a significant gap, then the second question is meant to further enhance or ascertain if any of the DZ strategies is ideal for maximizing income gains while minimizing inequality.

This dissertation offers two plausible theories on how preferential policies might influence income inequalities in cities. The first argument is based on the expected unbalanced growth that accompanies market capitalism: that because of the larger degree of decentralization and deregulation that is enjoyed by SEZs and OCs, coupled with more liberalized market policies, the rapid gains in economic growth will create higher income inequality within these cities by rewarding those with higher skills, experience, and performance at much higher rates than those with lower competencies. The second theory underscores the power of social programs at redistributing the gains and opportunities created

from rapid growth. These were predicated around providing better employment opportunities, social welfare programs, skills upgrading schemes, and greater financing for social spending. These theories are further elaborated in Chapter Four while the underlying policies are explained in Chapter Two.

1.5 Scope and Limitations

The scope of this study envelopes disposable household per capita income inequality analyses for the urban sample in the CHIP data. It does not include other types of inequalities such as those of assets, wealth, and health, among others. Furthermore, this study does not intend to examine the impact of particular policies on inequality, but rather the effect of preferential policies as a single policy instrument whose impact area is determined by the special statuses and jurisdictions conferred to different cities.

When performing research on China, the availability of data is always a constraint. The National Bureau of Statistics (NBS) provides end-results data in the form of tables and figures but does not provide the raw data for researchers to conduct their own analyses and calculations. In a similar fashion, the CHIP surveys are taken from a subsample of the NBS surveys; therefore, sampling methods, which are not entirely transparent, restrict the characteristics of the samples used, even though the CHIP surveys use a questionnaire that provides a definition of income different from the NBS. This lack of data, or access to data, further limits which explanatory variables are used in the analysis.

Another limitation was the availability of data in English. Most of the official sources of data from the NBS and previous studies were only available in Mandarin. In some cases, in which data and research are published online in particular text formats, translation software was

used, but this was not always possible for many publications that were not made available online in text formats that are translatable or not available at all.

1.5 Structure of Dissertation

This dissertation is divided into seven chapters as follows:

Chapter 1: Introduction: This chapter provides the background of the study, the research objectives, the data and methodology, the significance of the study, the scope and limitations, and the structure of the dissertation.

Chapter 2: Preferential Policies: This chapter elaborates on the history and development of SEZs and OCs as the main preferential policy instruments in China's economic transition. It gives a detailed explanation of the policies and benefits that these cities offer within their jurisdictions as well as their contributions to economic and social development in China. The diminishing advantages of preferential policies in China are also discussed, followed by a review of the relevant literature.

Chapter 3: Inequality: This chapter provides a summary of previous research regarding inequalities of income and education in China, with an emphasis on the transition period post-1978, highlighting differences in data samples, methodologies, and findings.

Chapter 4: Preferential Policies and Income Inequality: Methodology and Findings are presented in this chapter.

Chapter 5: Development Strategies and Inequality: Methodology and Findings are presented in this chapter.

Chapter 6: Discussion and Policy Implications: Discussion of findings is provided in this chapter along with policy implications.

Chapter 7: Conclusion: Concluding remarks and prospects for future research are presented in this final chapter.

Appendices: Appendices provide supplementary and complementary data, results, and findings from in this study.

Chapter 2: Preferential Policies in Urban China

2.1 Introduction

The status of benefiting from preferential policies has been granted by different governments, or regimes, to demarcated zones, or enclaves, and enterprises for many years with the hope of stimulating economic growth. Early examples include the entrepôts, or free ports, such as Gibraltar in 1704, Singapore in 1819, Hong Kong in 1848, Hamburg in 1888 and Copenhagen in 1891, which were citywide zones set up along international trade routes with the purpose of encouraging duty-free trade. (World Bank, FIAS, 2008) In the 20th and 21st centuries, however, most cases of preferential policies throughout the globe, have not been citywide, but instead are in the form of export processing zones (EPZs) and other types of smaller-scale demarcated economic zones usually located within, or adjacent to, a city.

The following sections describe how preferential policies have been implemented in China at the citywide level. Firstly, a problem in the usage of terms and definitions regarding the types of zones with preferential policies is discussed with the aim of highlighting that even though there are distinguishing aspects differing between zones worldwide, most research do not apply said distinctions in their analyses leading to confusion and generalizations regarding the Chinese model. Subsequent sections define Chinese special economic zones (SEZs), giving a detailed account of their development and purpose, which goes beyond trade-related functions, and portraying them as zones whose main purpose are for experimenting with different policies. The extension of SEZ policies to other cities designated "Open Cities" is also discussed followed by the creation of smaller "Development Zones" around China. After having elaborated on the different types of preferential policy packages, or jurisdictions, in China, a

critical review of previous literature regarding these zones is conducted, highlighting the contributions, as well as the shortcomings and limitations, of these studies.

2.2Terms and Definitions

"Preferential policies and autonomy" refers to the deregulation and autonomies given to Chinese cities. The adjective "preferential" must not be confused with special treatment in the form of subsidies or financing given from the state budget or the state bank system. "Because a centrally planned economy is an over-regulated economy, what the preferential policies really did was to remove some of these regulations, namely, the regulations against the marketization and internationalization of economic activities." (Démurger, et al., 2002, p. 6) Preferential policies and autonomy were first granted to Chinese SEZs. Prior to the discussion on the particulars of Chinese SEZs, however, it is crucial to emphasize the dissimilarities regarding the usage and definitions of the term "SEZ" in the previous literature, as this might provide clarity regarding any generalizations from such literature that are used to create any assertions concerning SEZs in China.

Firstly, literature review on the matter has revealed that many publications use the terms "EPZ" and "SEZ" interchangeably when referring to the same zones. This can be traced to definitions provided by international authorities on the subject, which try to encompass a broad range of zones by a single term. The most referenced of these aforementioned authorities are the International Labor Organization (ILO) and the World Bank. The ILO uses the term "EPZ" in their publications to refer to all types of zones with preferential policies, including SEZs and other zones that are unrelated to export processing, while the World Bank publications consider EPZs as a type of SEZ, even though they both acknowledge that the definitions do not apply to SEZs in China.

The ILO uses an "evolutionary typology" shown in Engman, Onodera, & Pinali (2007, p.15, Table 2)[8] under which it places SEZs as a manufacturing based EPZ, even though they admit that SEZs in China are designed not only to attract investment and generate jobs, but also "they are the vehicle for opening up the Chinese economy to market forces and for developing new export industries to absorb idle labour. In addition to the broader special economic zones, by 2002 China had 43 economic development zones (EDZs) operational at the national level, and 400 at the provincial level."[9] (ILO, 2003). This vague acknowledgement fails to include differences in scale and function, but is, nonetheless, the basis for future reports, including a list of all EPZs in the world (Boyenge, 2007) which mentions China having over 900 EPZs, but offers no definitions of what constitutes an EPZ.[10] As a result, Fu and Gao (2007) wrote a report specifically mentioning the differences between the ILO and Chinese definitions of the different zones, concluding that SEZs in China do not fit the ILO's definition, therefore, only China's smaller development zones (DZs) are comparable to EPZs. Many subsequent publications reference Fu and Gao (2007) but fail to adhere to the distinctions they mention and continue to include Chinese SEZs in their generalized EPZ definition as will be discussed later.

The World Bank publications regarding the subject are diverse in its term usage. Farole & Akinci (2011), refer to the ILO, and state a large number SEZs within China, albeit acknowledging there is a difference in scale, but do not accentuate differences in administration, policy and autonomy. Zeng (2010) acknowledges the differences between the different types of zones: "The term SEZ covers a broad range of zones, such as free trade zones, export-processing zones, industrial parks, free ports, enterprise zones, and others. As used in China, however, the term SEZ refers to a complex related economic activities and services rather than to a unifunctional entity." (p. 4), but decides to incorporate some of them into his SEZ definition

[8] This table was constructed by the OECD secretariat using ILO (2003).
[9] These numbers do not match official sources. No source or definition is provided for how these numbers were constructed.
[10] Includes SEZs, OCCs and DZs, but not other types of OCs like OICs and ORCs, and does not distinguish between any zones.

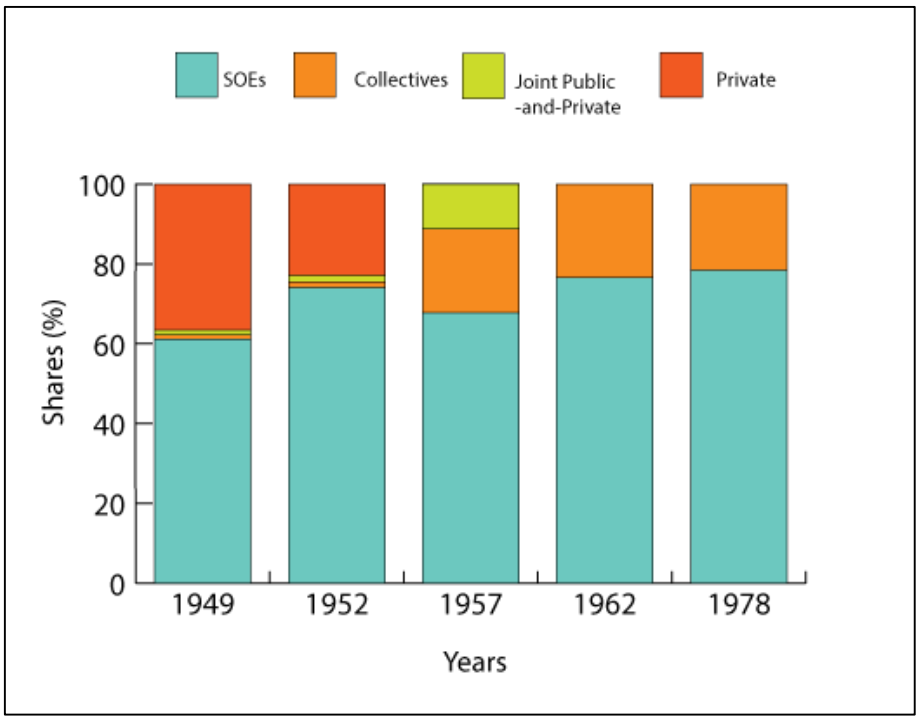
anyways: “In this book, however, the term is used in a broad sense; that is, it refers not only to the seven special economic zones (hereafter referred to as comprehensive SEZs) but also to China’s economic and technological development zones (ETDZs), free trade zones (FTZs), export-processing zones (EPZs), high-tech industrial development zones (HIDZs), and the like.” (p. 5)

2.3 Historical Context

The People’s Republic of China (PRC) was founded in 1949 and operated under an extremely-concentrated planned economic system until 1979, when reform policy was initiated. During these three decades, China was cut-off from the rest of the world and in an attempt to achieve self-reliance and central planning, it decided all economic activities, allocating resources and products using fixed prices with no regard to monetary and market mechanisms.

In 1949, the PRC’s economic base was dependent on agriculture, which accounted for 70% of national income and over 90% of the workforce. Income distribution was highly unequal, “wealth and productive means were concentrated in the hands of a few.” (Ge, 1999, p. 13) In order to restore social order, economic restructuring was undertaken in a gradual phasing during the 1950s under the central-planning system, modeled after the Soviet Union. The reform period from 1952-1957, as depicted in Figure 2.1, shows the evolution of ownership restructuring for non-agriculture enterprises.

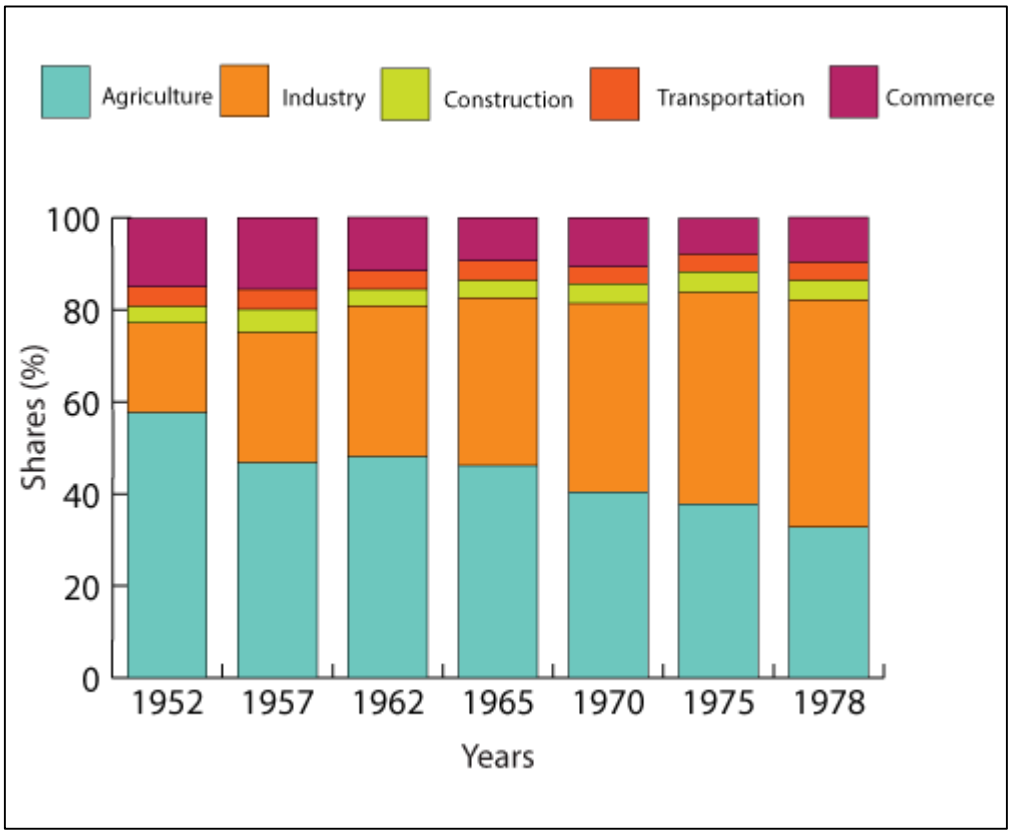
Figure 2.1: Ownership type share of workforce for non-agriculture enterprises



Source: Produced by the Author based on Ge (1999) Table 2.1

Essentially, in an effort to redistribute the nation's wealth and to exert control over the mobilization of resources, privately-owned enterprises were first gradually turned into joint ventures, and eventually into collectives across all economic sectors. This gradual restructuring converted the 36.6% of private enterprises in 1949 into collectives by 1957, after which private ownership of enterprises were completely banned, and collectives and state owned enterprises (SOEs) became the standard. State planning controlled everything from production and distribution to consumption and urbanization. Resources were allocated to SOEs according to the desired inputs and outputs instead of developing urban residential areas, therefore, migration to urban areas had to be restricted due to this lack of infrastructure.

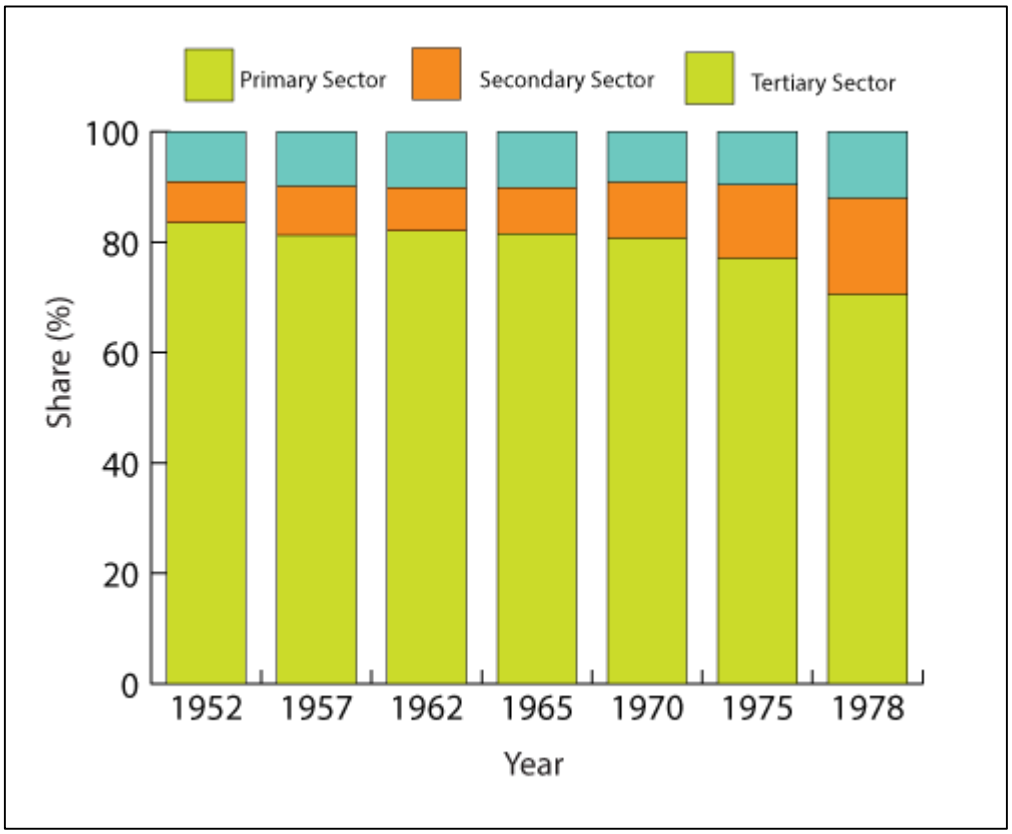
Figure 2.2: Percentage share of income by sector in pre-reform China



Source: Produced by the Author based on Ge (1999) Table 2.3 and State Statistical Bureau of China (1994) p.33

There were no financial markets, making banks serve the role of accountants, since lending and borrowing was banned. Economic restructuring supported the development of the industrial sector, which as shown in Figure 2.2, increased substantially, overtaking agriculture in 1970, and contributing almost half of national income by 1978. Other sectors such as construction and transportation remained relatively unchanged, reflecting a low investment in infrastructure, while commerce and agriculture decreased.

Figure 2.3: Percentage share of employment by sector in pre-reform China



Source: Produced by the Author based on Ge (1999) Table 2.4 and State Statistical Bureau of China (1994) p.83

Figure 2.3 shows the changes in the distribution of employment, which are consistent with the changes in Figure 2.2, in which an increase in the secondary sector corresponds with an increased share of employment, as well. These two tables (Figure 2.2 and Figure 2.3), however, illustrate what is considered a "persistent structural imbalance in the pre-reform Chinese economy… [where] construction, transportation, and commerce… prevented the economy from growing at a pace more compatible with its potential" (Ge, 1999, p. 23). This triggered lower growth rates during the late 70s, and raised the awareness for the need of economic rebalancing. The development during the pre-reform era raised concerns whether the

development strategy and economic policies were the most adequate for improving the standard of living. Debates regarding the industrial sector as the main source of growth, the relationship with the outside world, the trade-off between accumulation and consumption, as well as the role of the central-planning system, underscored the need for reform.[11]

In December 1978, during the Third Plenum of the Central Committee of the Eleventh Chinese Communist Party Congress, economic reform became the center of national development strategy. How to implement the needed reforms posed a challenge for Chinese leaders. "Policy makers and researchers studied carefully the cases of former centrally planned economies, including Hungary, Poland, Czechoslovakia, and Yugoslavia…[as well as] various market-driven economies…despite the lessons drawn from these studies, no single prescription appeared readily available to formulate a systematic and comprehensive reform platform." (Ge, 1999, p. 42)

Against this backdrop, it was decided to advance economic reform and transition in a gradual manner, instead of a top-down nationwide reform which could produce a large economic shock. Market policies would be implemented in experimental zones which were setup in underdeveloped areas in order to avoid contagion from negative policies to the rest of the economy, which would remain under the state-planning system. In this trial and error fashion, different policies could be experimented with; the successful ones would be later applied nationwide.

[11] Two movements also served to exacerbate the need for change. First the "Great Leap Forward" (1958-1960) which intended to mobilize rural workforce into industrialization, but instead caused a crash in the agricultural sector, which in turn caused the industrial sector to fall, fueling a deep depression during the early 1960s. Second, the "Cultural Revolution" (1966-1976) was characterized by political and ideological movements of the nation's youth echoing discontent with economic bureaucracy for a ten year period.

2.4 Special Economic Zones

In 1980, the PRC decided to establish four SEZs in the underdeveloped provinces of Guangdong and Fujian, which had a low integration to the Chinese economy. “In order to minimize the possible negative impact on the rest of the economy should the SEZ efforts fail, all four zones were set up in backwards areas.” (Ge, 1999, p. 47) The objective of setting up SEZs was for them to serve as laboratories for reform and bridges for FDI, acquiring advanced technology, and equipment by allowing enterprises (SOEs [12], foreign-owned, and joint ventures[13]) to function within a policy environment based on market mechanisms instead of elsewhere in the economy. Successful experiments would then be implemented in the rest of the country.

The basic concept of SEZs was to replicate the successful experiences of EPZs in some of the Asian countries, which had been established with the aims of promoting exports, attracting foreign capital, creating employment opportunities and promoting regional development. “But SEZs of China are more ambitious in terms of policies, activities and geographical coverage than the EPZs. The SEZs are a comprehensive economic development area where investors[14] can invest in industry, agriculture, animal husbandry, tourism, housing, high-grade technology and other ventures of common interest.” (Gupta, 1996, p. 35)

[12] SOEs could be owned by local authorities or by authorities of other provinces.
[13] Includes equity joint ventures and contractual joint ventures.
[14] Foreign and local.

Figure 2.4: First five SEZs in China

Source: Created by Author. (2014)

The first four SEZs were located near areas operating under market economies, which contained large Diasporas of Chinese migrants: Zhuhai, which is located next to Macau; Shenzhen, which is across the bay from Hong Kong; and Shantou and Xiamen, which are both near to Taiwan. The first three were located in Guangdong province and the fourth in Fujian province, as can be seen in Figure 2.4. These zones were bestowed with greater administrative and financial autonomy, conferring to them many freedoms unavailable elsewhere in the country, including the right to approve large scale investment projects using foreign funding,

the power to offer fiscal incentives, such as tax concessions, and experiment with market mechanisms, such as the market price, labor mobility, private ownership, among others. Furthermore, the Island of Hainan, became the fifth and largest SEZ in 1988, gaining the status of a separate province, as well.

Administratively, all SEZs were separate planning entities and autonomous customs areas. The most important factor differentiating the five SEZs from other areas of China is that, they are more or less parallel with the levels of local government having powers to make laws and considerable freedom with regard to taxation. (Gupta, 1996, p. 47) The autonomy to create and implement laws and preferential policies is highly characteristic of SEZs.

2.4.1 Preferential Fiscal Incentives

Table 2.1 illustrates an example of the various incentive packages available to enterprises in SEZs. SEZs enjoy a 15% corporate tax in general and 10% on units where exports are more than 70% of their production, compared to 30% charged outside the zones. Productive enterprises with more than 10 years of operation terms have been exempted from income tax in the first and second profit making years, and 50% reduction for the subsequent three years. Additional exemptions are granted to those investing in infrastructure or high technology. (Gupta, 1996, p. 43) “For those that introduced advanced technology for free or on favorable terms were exempted from business tax and enterprise income tax, and the income from technology transfer was exempted from sales tax.” (Li, Duan, & Zhang, 2010, pp. 106-107)

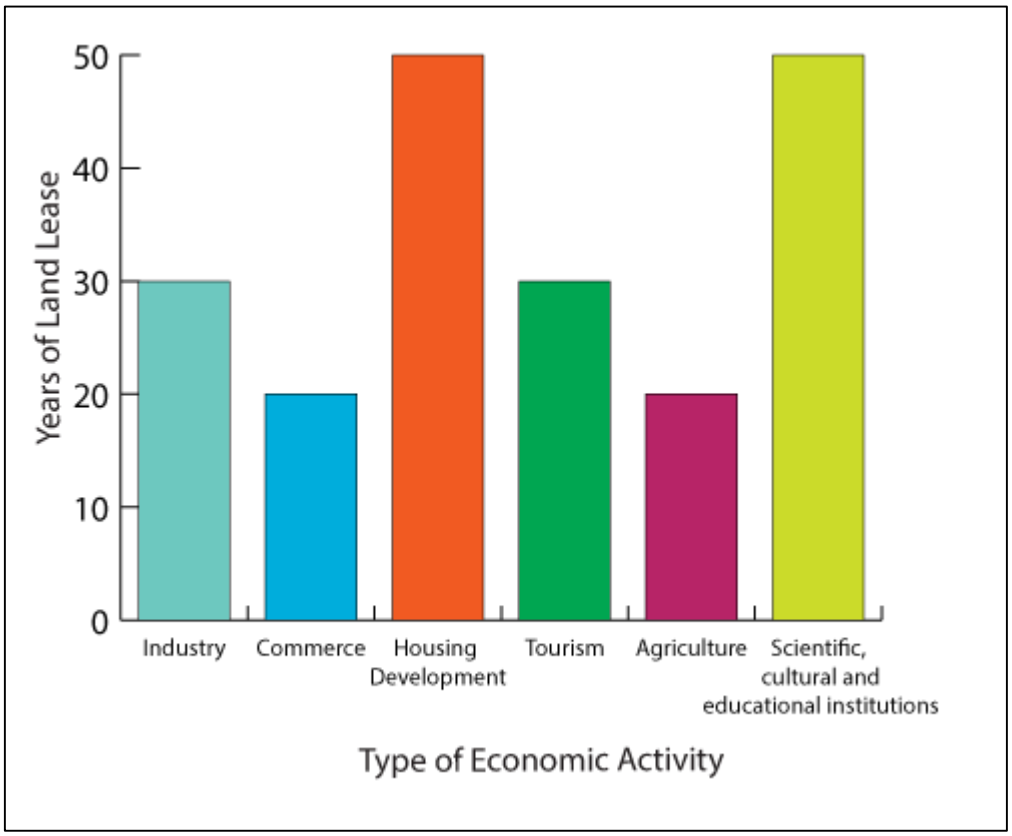
Table 2.1: SEZ incentive packages

Incentive	SEZ	Rest of Country
National Income Tax	15%*	30%
Local Income Tax	3% or less	3%
Remittance Tax	0	10%
Unified Industrial and Commercial Tax on imports of capital goods	0 for production 50% reduction for tobacco & mineral oil	--
Unified Industrial and Commercial Tax on Exports	0 if produced in SEZ	--
Tax on domestic sales	50% reduction	--
Land use rights	Up to 70 years	--
Foreign Trade	Exempted from exports licensing	--
Finance	a) Can raise funds directly from abroad b) Permit the establishment of foreign bank branches, Sino-foreign joint-capital banks	
Foreign exchange	50% retention rights	
Labor policy	Freedom of Management-Hiring of foreign technical & Management staff; right to hire and fire local staff and workers; income of foreign workers can be repatriated after payment of tax	

Note: * If more than 10 years of operation: Exempted from income tax to the first two profit making years and 50% reduction for next 3 years. Moreover, technologically advanced enterprises can enjoy 3 additional years of a 50% reduction.

Source: Created by Author based on Gupta (1996) p.71; Ge (1999) p.83; Zeng (2010) pp.77-85;

Figure 2.5: Land-use regulations in Shenzhen

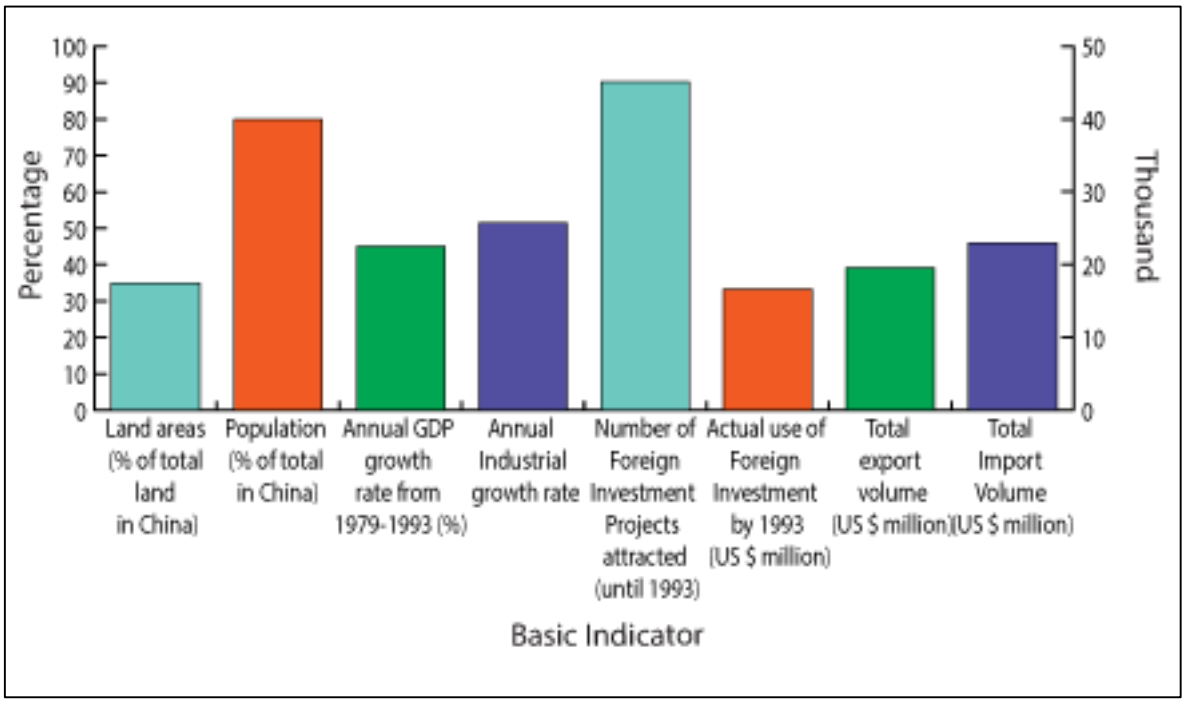


Source: Created by Author based on Ge (1999) Table 3.3.

Furthermore, each zone can choose its own local tax rate with a ceiling of 3% while outside it is uniformly 3%. The zones are exempted from commercial taxes on exports. Also if the profits of foreign funded enterprises are reinvested the taxes are refunded. Tariffs and interest rates are also given at preferential, zone-specific and time-specific. Additionally, land use rights were negotiated at different rates and periods depending on the economic activity, for example, commercial and industrial sectors had a lower priority than housing and scientific, cultural and educational institutions, as can be seen in Figure 2.5, which shows the regulations in Shenzhen; but leasing and land-use incentives were very similar in all SEZs.

2.4.2 Performance

Figure 2.6: Five SEZs First 13 years' basic indicators



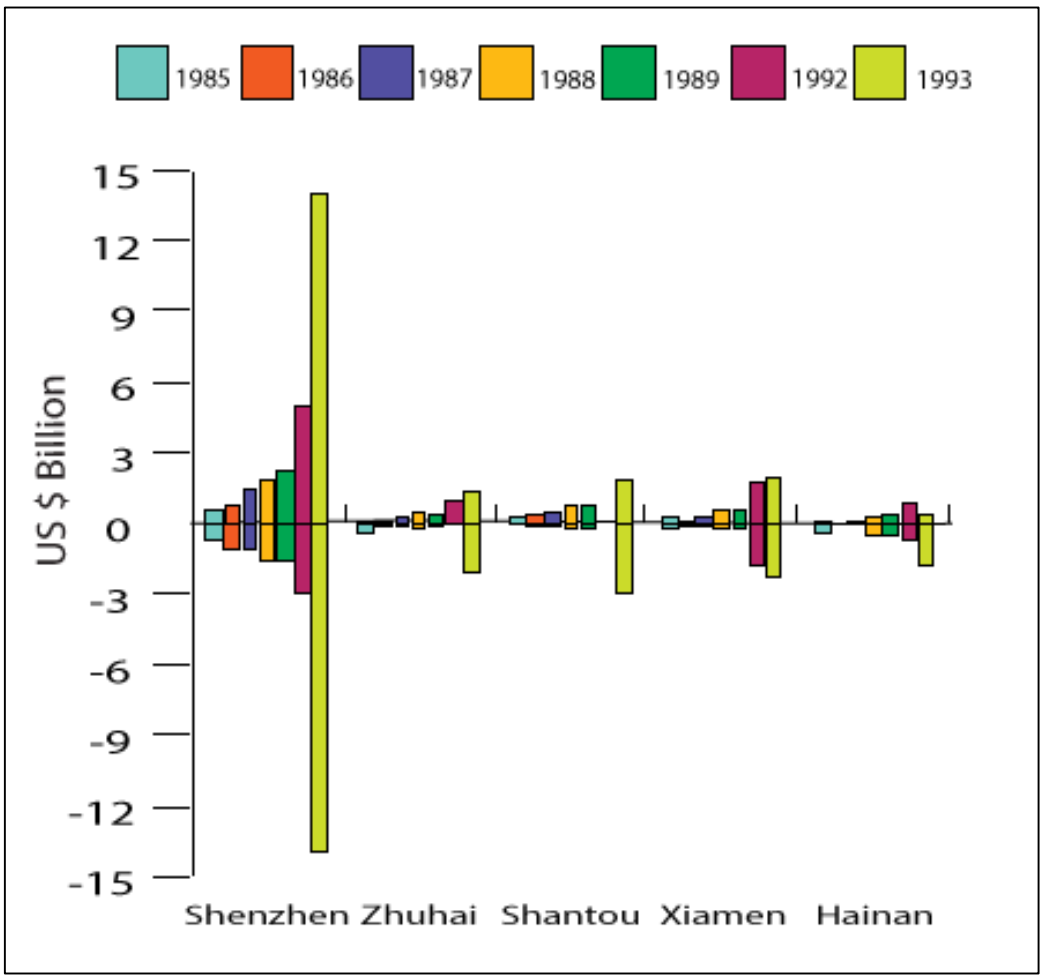
Source: Created by Author based on Gupta (1996) p.35

The SEZs had a virtually instant impact: in 1981, the four zones received 59.8 percent of the total FDI in China. "As a result, against a national average annual GDP growth of roughly 10 percent per year in 1980–1984, Shenzhen grew at a phenomenal 58 percent annual rate, followed by Zhuhai (32 percent), Shantou (9 percent), and Xiamen (13 percent). Over the same period, Shenzhen's economy expanded six-fold, as opposed to 1.5times for China as a whole, 3 times for Zhuhai, 1.4 for Shantou, and 1.6 for Xiamen." (Yeung, Lee, & Kee, 2009, p. 225) As can be seen in Figure 2.6 the first decade has shown the SEZs to have had an amazing growth rate that saw them start off as small towns or villages and through a surge in FDI, from over 45,107 projects, they were able to grow into modern urban centers equipped with transportation

and power grids, water networks, factory buildings, business centers, restaurants, hotels and other tourist facilities that grew around a healthy investment environment.

The SEZs had an annual GDP growth rate of 45%, compared to the national average which was around 13%. This allowed them to invest heavily in infrastructure that was conducive to trade related activities such as well-equipped railway stations, well developed highway network systems, deep water ports, international airports, and power stations. The returns of these infrastructure investments are reflected in their high trade performance shown in Figure 2.7.

Figure 2.7: Trade performance of SEZs



Source: Created by Author based on Gupta (1996) p.66

The exports and imports of all the SEZs increased dramatically from 1985 to 1993. Shenzhen, the most successful case, shows an increase in exports from US $563 million in 1985 to US $14 billion in 1993 and an increase in imports from US $743 million in 1985 to over US $13 billion in 1993. While, by 1992, all the SEZs had trade surpluses, by 1993 Shenzhen is the only SEZ shown to have a trade surplus, while the rest show deficits, indicated by a substantial increase in imports.

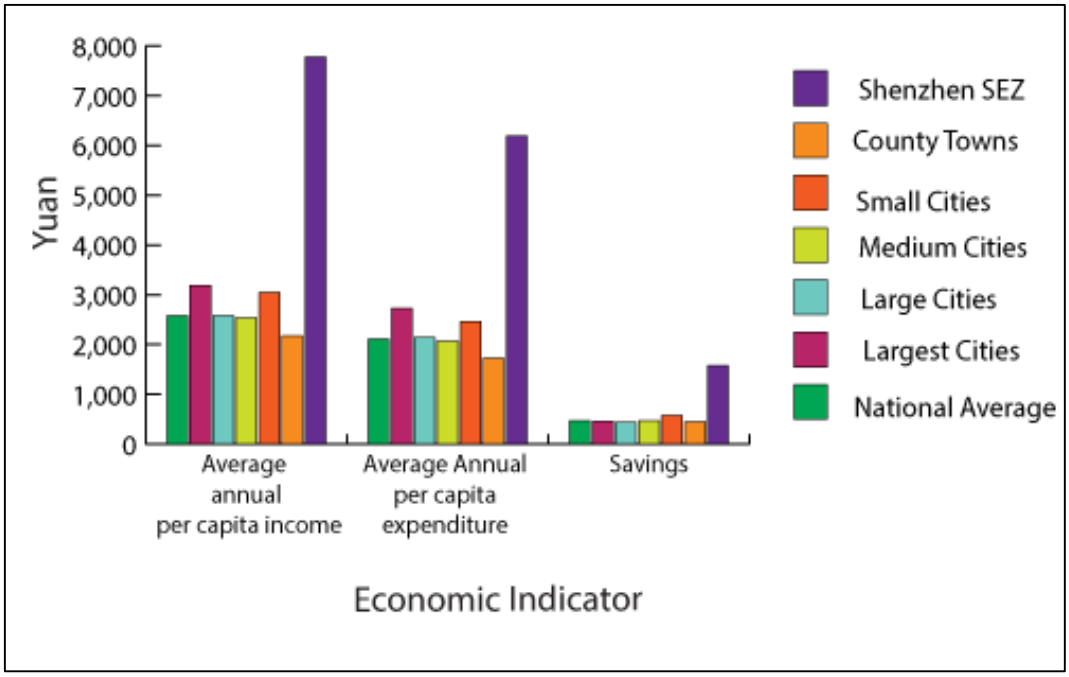
2.4.3 Benefits

The direct benefits of SEZs come from export growth, government revenue, FDI, and foreign exchange earnings, while the indirect benefits include skills upgrading, technology transfer (Xie, 2000; Liu Z. , 2002), enhancing efficiency of domestic firms, and serving as a testing field for wider economic reform. The SEZs were able to absorb a large labor force and create new employment opportunities. "The creation of employment opportunities is one the immediate benefits ensuing from an upsurge in foreign-capital inflow." (Ge, 1999, p. 83) Also, the linkages between domestic and foreign enterprises create indirect employment through an increase in domestic activity. The effect is the equivalent of creating a domestic Diaspora, circumventing brain circulation, since migrants that would otherwise want to leave the country in search of opportunity, could now migrate to the SEZs, instead. In Shenzhen, labor circulation was implemented as "workers were appointed by the government for a three-year term and then were required to leave the zone. Many managers subsequently started their own firms, capitalizing on experience gained in the SEZs. This put competitive pressure on firms within the SEZs to innovate or disappear." (Farole & Akinci, 2011, p. 195) Wages were also increased and the first minimum wage laws appeared first in SEZs. By law wages in SEZs were 120-150% higher than the average wage in SOEs. The wages per worker in SEZs in "state-owned, non-state-owned, and other ownerships were 2.5, 2.2, and 1.5 times higher than the corresponding national average, respectively." (Ge, 1999, p. 89) The creation of a free-labor market emerged from SEZs, where wage reform consisted of adopting a social insurance package, a minimum wage, and basing compensation on a base pay, occupational pay and a an allowance. (Zeng, 2010, p. 17)

The SEZs developed infrastructure including residential housing and "facilities used for educational, cultural, fitness, and health-care purposes, [which] also contributed to the early effort to improve the overall quality of life in the SEZs." (Ge, 1999, p. 62) These include

international schools and foreign-funded hospitals. (Wang & Hu, 2010) “The SEZs were active…in experimenting with various types of social welfare systems, ranging from housing, pensions, and medical care to unemployment compensation. Reforms were also made in developing different types of job-training and employment-replacement programs.” (Ge, 1999, p. 137) Quality of life and improved standard of living can be inferred from increased income, expenditure and savings as is shown in Figure 2.8. Compared to other cities, Shenzhen SEZ had a larger average household size, more employed people per household, more than twice the average income and expenditures, and most significantly, more than 2.7 times the average savings amount per household.

Figure 2.8: Household income and expenditure in urban China in 1993



Source: Created by Author based on (Ge, 1999) Table 4.14

Further social benefits have come from the establishment of nonprofit organizations for education, culture, science and technology, which benefit from preferential policies, and committed and efficient public services provided by government. The skilled workforce also gains from support and assistance in Hukou[15] transfer, subsidies for children's education, research funding, and complimentary housing policies. (Li, Duan, & Zhang, 2010)

The linkages to the mainland economy were also important, as they were able to make use of the advanced technology, managerial skills, and other benefits by establishing representative offices within the SEZs; sending employees for training; setting up business introduction offices; establishing joint-ventures and co-operatives within the zones. (Gupta, 1996, pp. 62-63)

[15] Hukou is China's residential registration system.

"The overall structure of the SEZs was much more comprehensive than that of the free-trade and export-processing zones established elsewhere, in which economic activities tended to be narrowly focused. In many ways, developing such a zone amounts to an entire process of urbanization: an open, modern city grows rapidly out of a piece of essentially undeveloped land." (Ge, 1999, p. 50) This urbanization process is reflected in the construction of the "Pudong New Area" in Shanghai, which was formed in 1990, and became the sixth SEZ in 1992. (Yao Y. , 2009, p. 228) "The policies governing the development of this area were said to be more 'special' than in the five previously established SEZs." (Ge, 1999, p. 116) This indicates that the preferential policies that are implemented in newer SEZs are even more liberalized than in the previous zones. In addition, to the original five, currently, "in China, SEZ normally refers to seven specific zones: Shenzhen, Zhuhai, Shantou, Xiamen, Hainan, Shanghai Pudong New Area, and Tianjin Binhai New Area." (Zeng, 2010, p. 5)

Besides job creation (in urban and rural areas),)surging exports and GDP growth, the SEZs have made substantial contributions to the nation in the form of reforms to the economic system, land tenure, the price system, labor market, the financial system and SOEs. The pension system and the social security system was first implemented in Shenzhen in 2001, and then applied nationwide. Initiatives aimed at improving efficiency, governance and transparency implemented through an audit system have also been undertaken in an effort to improve performance. (Yuan, et al., 2010) Furthermore, there has been a shift in the usage of FDI from export development towards creating a local market that benefits from the policies stimulating technology transfer and accumulation of technological capability. (Lee, Lee, & Ryu, 2003)

Moreover, SEZs have evolved from the original SEZs to Open Cities, which are cities that granted the SEZs' preferential policies and autonomy, and ETDZs, which are a smaller version of SEZs. Both of these cases are explained in the following sections.

2.4.4 Educational Reforms

This dissertation considers that the preferential policies granted at the city level to the SEZs and OCs have provided the residents of these municipalities with a competitive and comparative advantage over the rest of the nation which could be reflected in a higher quality of life and other social measures. From the 1980s, cities with preferential policies, especially the SEZs and coastal cities, were encouraged by the government "to carry out a number of significant educational reforms which, in effect, left many of the regions to the west less developed." (Hawkins, Jacob, & Li, 2008, p. 218) SEZs were structured to include educational institutions as part of their reform experiments. (Ge, 1999, p. 49) Education and manpower training were important factors in the rapid development of the SEZs, which was reflected in the increase in the number of schools, ranging from pre-primary school to institutions of higher learning, and the number of enrolled students, particularly undergraduate and specialist training programs (MacPherson & Lau, 1996). SEZs and OCs also diversified their channels of educational funding, raising school fees, work placement schemes from higher education and vocational and technical schools, donations and fund-raising, and contributions from industry (Mok & Chan, 1996). Furthermore, private schools reemerged in SEZs and OCs in the 1980s, as educational initiatives by entrepreneurs emerged to meet the increasing demand (Kwong, 1997).[16] Additionally, the majority of international schools and foreign universities in China are located in SEZs and OCs (Deloitte, 2014). Links between industry and higher education institutions were fomented by allowing renowned universities to establish campuses to conduct vocational education and industry-related research (Zeng, 2010; Li, Duan, & Zhang, A Case Study of Tianjin Economic-Technological Development Area, 2010). Cities with preferential policies also offered postdoctoral scientific research grants in an effort to encourage and

[16] Compared to the reemergence of private schools in cities without preferential policies in 1992.

develop highly skilled human resources. Additionally, subsidies for child education and the establishment of non-profit organizations for education, culture, and science were incentivized by SEZs and OCs (Yuan, et al., China's First Special Economic Zone: The Case of Shenzhen, 2010). Spending gaps are evident between cities with preferential policies and other cities. By investing and ensuring access to high-quality educational facilities, SEZs and OCs were in an advantageous position to attract good teachers, which could, in turn, lead higher educational performance (World Bank, 2011).

Policies aimed at lowering educational disparities include the "two exemptions and one subsidy" (TEOS) policy and the free compulsory education (FCE) programs in the early 21st century. Under these programs, students were exempted from miscellaneous fees and benefited from free textbooks. While most SEZ/OCs did not qualify to participate in these centrally funded schemes, the local administrations promoted their own schemes to support students with financial difficulties. These were later extended to cover all urban students. (World Bank, 2011, pp. 209-237)

2.5 Open Cities

Following the immediate result of preferential policies in SEZs, in 1984 the PRC decided to expand the open policies of the SEZs to 14 cities that were located along the coast, which designated Open Coastal Cities (OCCs): Beihai, Dalian, Fuzhou, Guangzhou, Lianyungang, Nantong, Ningbo, Qinhuangdao, Qingdao, Shanghai, Tianjin, Yantai, Wenzhou, and Zhanjiang. In these 14 OCCs, a variant of the SEZ was created: the economic and technological development zone (ETDZ), which is discussed later, but is primarily a smaller scale version of an SEZ.

Open Cities (OCs) receive citywide preferential policies and autonomies that are comparable to SEZs, but to a lesser advantage than SEZs.[17] For example, while corporate tax is 30% nationwide and 15% in SEZs, as stated in Table 2.5, "the open cities receive incentives of 24% as corporate tax" (Gupta, 1996, p. 91). In the years that followed, provincial capitals, cities along the Yangtze River, including Chongqing, Jiujiang, Fuling, Wanxian, Wuhu, Wuhan, Yueyang, and Yichang, and a few border cities, also became OCs. "These cities became giant de facto SEZs, as almost all of the incentives available to exporters operating in the area-specific SEZs became available to exporters operating there as well." (McCallum, 2011, p. 6)

[17] OCs that have ETDZs offer the same preferential policies as SEZs within their ETDZs, but offer lesser advantageous policies in the rest of the city.

Figure 2.9: SEZs and Open Cities in China

Source: Created by author. (2014)

By the end of 1992, there were 60 cities with preferential policies and autonomy in China: "5 Special Economic Zones, 15 open coastal cities[18], 8 open riverside cities [ORCs], 19 open inland cities [OICs] and 13 open boarder cities… China's SEZs (particularly the open cities) are more jurisdictions than physical zones-- a Chinese innovation." (Fu & Gao, Export Processing Zones in China: A Survey, 2007, p. 4) These 60 SEZs and OCs are shown in Figure 2.9.

[18] Weihai became the 15th OCC in 1992.

2.6 Development Zones

2.6.1 Economic and Technological Development Zones (ETDZs)

In 1984, the PRC created 14 ETDZs in the 14 OCCs. ETDZs enjoyed exactly the same preferential policies as SEZs but were smaller in size, covering a zone that was within or adjacent to a city, while SEZs covered entire cities. Also, the ETDZs focused on technologically advanced projects, while SEZs were more comprehensive. "The ETDZs are conspicuously characterized mainly by industrial production and scientific research, with foreign trade, finance and commerce serving the production and life in the locality, relying on the cities in which they are located." (Gupta, 1996, p. 80) After the original 14 ETDZs, 35 more were created in 1992, and by 2002, there were a total of 54 "state level" ETDZs. These were located in both cities with and without citywide preferential policies. (Linhe, 2005)

The objectives of the ETDZs were to attract foreign funds and develop high-tech industries while taking advantage of their host city's endowments, such as abundant land, rich natural resources, convenient transportation, technology and human capital. This was attained by creating a very favorable investment environment and developing excellent infrastructure. (Li, Duan, & Zhang, A Case Study of Tianjin Economic-Technological Development Area, 2010) . The ETDZs' share of FDI grew from 8% in 2000 to 16.7% in 2005, more than doubling in only five years. The share of exports also doubled from 6% to 12% from 1995 to 2005. Even though the total area of all ETDZs is only 0.006% of China, by the end of 2005, they contributed 7% of Industrial Value Added (IVA), 3.8% of GDP, and 8% of GIO of China, and the ETDZs' real FDI stock had reached US $99.93 billion (16.1% of total FDI in China). (Fu & Gao, Export Processing Zones in China: A Survey, 2007)

Bahl (1996) had identified a heterogeneous nature among ETDZs whereby they weren't focusing on the same sectors. Guanjiang & Qiang (1996) classified ETDZs into five varieties:

(1) ETDZs with Industrial Orientation, which concentrated on manufacturing advanced and high technology with an emphasis on exports; (2) Financial, Commercial and Trade ETDZs, which engaged primarily in financial, trade and commercial services; (3) Hi-Tech ETDZs, which concentrated on advanced technology and high-tech sectors of industry; (4) ETDZs with export processing, which gave priority to the processing industries which turn put products for export; and (5) ETDZs with multi-functions, which provided comprehensive living conditions and services for production, living and entertainment. Over time, however, these ETDZs would expand their areas of function further blurring the lines between these categorizations.

Table 2.2 illustrates that more than 75% of all ETDZs were developing integrated mechanic-electronic products. These electronics included but were not limited to electronic measurement devices and appliances, electronic components, specialized equipment, instruments, microelectronics, quartz crystal components, diode chips, electronic function modules, automobile sensors and similar new type of electronic components. Additionally, more than 60% were developing biotechnology and pharmaceuticals which included the development of new types of antibiotics, anti-tumor medication, hepatitis drugs, cardio-vascular medicine, genetically-engineered algae, and cell engineering technologies. Bio-pharmaceuticals also included the development of medical appliances and compound packaging materials for medicines. More than half of all ETDZs had industries related to food processing. Food industries involved fresh-preservation technologies for produce, fine processing of cereal and edible oils, green food production, tonic beverages, liquors and wines, perfume essence, and supplementary feeds.

Table 2.2: Industries in China's 54 National ETDZs.

Industry	Number of ETDZs	Share of ETDZs
Integrated mechanic-electronic products	41	75.93
(Bio) Pharmaceuticals	35	64.81
Fine Processing of foods	34	62.96
Refined Chemicals	28	51.85
new materials	26	48.15
IT	23	42.59
Textiles/Rubber	20	37.04
Automotive	19	35.19
Machinery	17	31.48
Photoelectric information	10	18.52
Metallurgy	8	14.81
Finance/Insurance/Services	8	14.81
Printing	7	12.96
Power Generation	6	11.11
Plastic Cement	4	7.41
Ship building	2	3.70
Wastewater Treatment	2	3.70
Airplanes	1	1.85

Source: Compiled by author using China Internet Information Center (2016).

More than half of ETDZs were involved in refined chemicals. Some of these industries also produced cosmetic products, engineering plastics, organic chemicals, synthetic materials, and polyesters. Almost half of the ETDZs had industries related to new materials. These included bathroom products, ceramics, decorative materials, fiberglass, float glass, and building materials such as water-proof paint, fire-resistant materials, and high-grade roof and wall building materials.

2.6.2 Hi-Tech Industrial Development Zones (HIDZs)

HIDZs mainly rely on domestic scientific and technological strength and industrial foundation to optimize local environment for tech-based business creation and development

and are, therefore, innovation-based zones. (Qian, 2008) As of 2005, there were 53 HIDZs "The HIDZs also play very important role in the employment of skilled labor. At the end of 2000, there were 0.56 million scientists and technicians among the 2.51 million employees working at HIDZs, which was 22.3 per cent of the total work force." (Fu & Gao, 2007, p. 35) Qian (2008) highlights that 18% of the workforce in HIDZs is dedicated to R&D, while Zhong, Luo, & Zhong (2009) describe that around half of China's high-technology companies, including science and technology incubators, were located in an HIDZ and had registered a combined 50,000 invention patents. HIDZs are aimed at commercializing research and development while upgrading particular industries such as medical and pharmaceutical products, aviation and aircrafts manufacturing, electronic and communications equipment, and information technology, among others. These zones are very similar to ETDZs but enjoy from additional incentives for innovation.

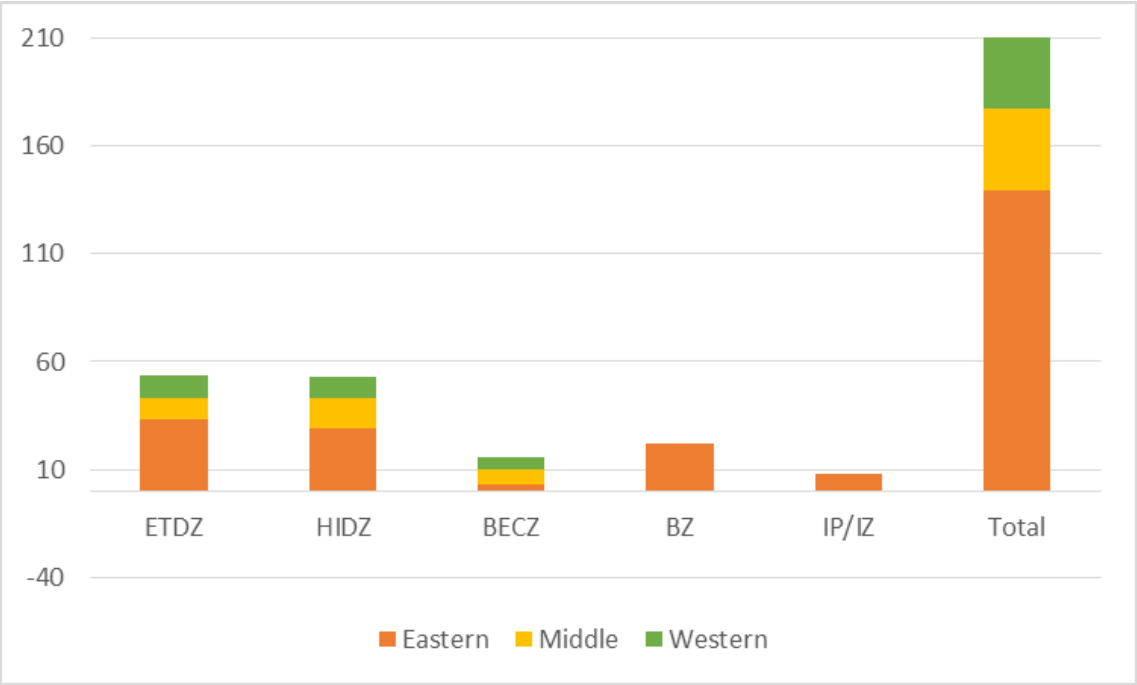
Table 2.3 shows that more than 80% of HIDZs have IT as one of their primary industries. More than double the share of ETDZs, shown in the previous table. Simlarly, more than 30% of HIDZs are focused on energy and power generation, compared to only 10% of ETDZs. HIDZs and ETDZs, however, seem to be competing in terms of Bio-Pharmaceuticals and New Materials. Additionally, a few HIDZs are developing Spaceflight and Defense Technologies compared to none of the ETDZs.

Table 2.3: Industries in China's 53 National HIDZs.

Industry	Number of HIDZs	Share of HIDZs
IT	44	83.02
Bio-Pharma	36	67.92
New Materials	30	56.60
Optical-mechanical-electronics	21	39.62
Energy saving/ environmental protection/new energy	16	30.19
Advanced Machinery	14	26.42
Advanced manufacturing tech	12	22.64
Automobiles	10	18.87
Chemicals	9	16.98
Electronics	6	11.32
Resource Processing	4	7.55
Food processing	4	7.55
Micro-electronics	3	5.66
Aviation and spaceflight	3	5.66
Agricultural High-Tech	1	1.89
Marine Technology	1	1.89
Defense Technology	1	1.89
Animation	1	1.89
Logistics	1	1.89

Source: Compiled by author using China Internet Information Center (2016).

Figure 2.10: Development zones by region in China



Source: Created by Author based on Fu and Gao (2007) Table 2

Along with other types of zones, by end of 2005, there were 210 national DZs as shown in Figure 2.10. Most of these zones are located in the eastern region of China; ETDZs and HIDZs, are the most prevalent. . In 1990, 13 FTZs were set in coastal areas, including SEZs. Additionally, 38 EPZs have been created. (Linhe, 2005)

2.7 Diminishing Advantage

2.7.1 Equalizing Agents

While SEZs have enjoyed the advantage of preferential and more liberal policies, once these become implemented nationwide, they lose that advantage. Therefore, there is a diminishing advantage from the preferential policies, and these policies, once implemented in the rest of the country, act as equalizing agents that help converge disparities due to the

preferential policies. For example, before 1986, joint ventures were the only allowed form of FDI outside SEZs. It wasn't until 1986 that wholly-owned foreign enterprises were allowed outside SEZs. Therefore, for 6 years, the SEZs had the preferential advantage of being the only place foreign enterprises could operate, but once this was allowed elsewhere, they lost this specific advantage.

Many of the special policies initiated in SEZs and OCs were extended to many parts of China by 1994, and the country began to undertake nationwide reforms in foreign exchange control, tax remission, and foreign trade regulation. (Yeung, Lee, & Kee, 2009, p. 226) These equalizing agents also include the Trade Union Law of 1992 and the Labor law of 1994. Under the 1994 tax-sharing system, a unified tax rate of 33% was made generally applicable to all private and foreign enterprises. "Findings suggest that the tax-sharing system has been quite successful in boosting centrally collected tax revenues from various sources in provinces with different economic structures. In particular, the introduction of a securities transaction tax has targeted richer provinces, like Guangdong. Over time, this new category has successfully raised the centrally collected tax in more developed provinces." (Loo & Chow, 2006, p. 224) This has been a tactic to raise revenues from zones with preferential policies. These reforms have also contributed to reducing the advantages of preferential policies in SEZs and OCs.

2.7.2 WTO Accession

The loss of preferential advantages was even more evident after China's accession to the World Trade Organization (WTO) when many of the SEZ policies were adopted at the national level; which implies that there is a diminishing effect of institutional reform and a diminishing advantage of favorable policies that must be taken into consideration for the long-term planning of SEZs and therefore SEZs must strive to continually innovate and reform

through new policies to maintain a competitive advantage.[19] Consequently, ETDZs have been making strides in order to adhere to world-class standards regarding environmental protection, education, science and technology, urban transport, health care and other social undertakings that may be considered by some to have been lagging behind.[20] (Yuan, et al., China's First Special Economic Zone: The Case of Shenzhen, 2010)

China introduced a new tax regime in 2008 that essentially did away with the tax holidays that were previously offered in the SEZs and OCs, and harmonized the tax structures between cities with preferential policies and the rest of the nation. This new regime is in compliance with the WTO. (Farole & Akinci, 2011)

The WTO regulates preferential policies in the Agreement on Subsidies and Countervailing Measures (SCM Agreement), and the Agreement on Trade Related Investment Measures (TRIMs Agreement). It is important to note that, under the SCM Agreement, not all the subsidies are forbidden, only those of which are contingent upon export performance or use of domestic over imported goods.[21] Other categories of subsidies, even if not forbidden, may be open to challenges from other members.[22] The TRIMS Agreement does not veto every incentive measure, but only those listed in the Annex, mainly, local content requirement, export performance requirement and foreign exchange balance requirement. Based on these WTO provisions, Swiss law firm Wenfei Attorneys at Law[23] summarizes the rules of WTO with respect to preferential policies as follows:

[19] The Enterprise Income Tax Law of China (2007): states that the enterprise income tax will be uniform throughout the nation, eventually.
[20] The case of the China-Singapore Suzhou Industrial Park reflects the adherence to world-class standards in an effort to improve competitiveness. The Case of Kunshan Economic and Technological Development Zone is a good demonstrator of a "harmonious society, with sound public services and social security system and well integrated ecological and humanistic functions." (Wang & Hu, 2010, p. 149)
[21] Refer to Article 3 of SCM Agreement.
[22] Refer to Part III of SCM Agreement
[23] Wenfei Law being the first Swiss law firm with offices in China, has been offering Sino-European expertise to both European and Chinese enterprises for many years.

1. Investment incentives including subsidies based on requirements of local content, export performance or foreign exchange balance, are forbidden;
2. Importation policies for special economic areas of China shall be brought in line with policies for other parts of China;
3. China may sustain preferential arrangements for enterprises within special economic areas and shall ensure non-discriminatory application of these arrangements;
4. China is obligatory to notify WTO of any additions or modifications to its special economic areas, including notification of the laws, regulations and other measures relating thereto.

Apart from these rules specifically targeting SEAs[19], China's commitments in more general sense such as tariff concession should be taken into consideration in judging on the sustainability of preferential policies applied to SEAs. (Wenger, Vieli, & Belser, 2003)

From these extractions, the sustainability of preferential policies within the WTO rules, it can be expected that tariffs will eliminate Bonded Zones, and provide loss of significance to EPZs. Preferential Tax Rate at 10% for the Year in which Export Value exceeds 70% will be fully revoked since this benefit is contingent upon export performance. Also, the tax refunds due to reinvestment will also disappear. Nonetheless, reduced corporate income taxes of 15%, tax exemptions and reductions, currently two years of exemption and 3 years of reduction by half (7.5%), and an additional three years of 50% reduction for enterprises that adopt advanced technology (7.5%); local income tax exemptions and reductions; and other benefits regarding value added tax (VAT) transactions, trade processing, foreign exchange account fees and limitations waivers will continue to be significant. Therefore, the majority of existent preferential policies, since they are not related to export performance, will survive the WTO rules.

2.8 Previous Studies

After having defined SEZs, OCs and DZs in China, a review of previous research regarding preferential policies in China will be given. Some of these studies do not adhere to the above definitions; therefore, their results and conclusions might be at times incomplete or invalid. An objective examination will be conducted of these studies.

2.8.1 Global Studies

As mentioned earlier, most international comparative research follow World Bank and ILO definitions. World Bank, FIAS (2008) is one of the most cited. This report compares over 3,000 "SEZs" in over 135 countries and groups zones into different types such as FTZ, Traditional EPZ, Hybrid EPZ, Freeport, Enterprise Zone, Single Factory EPZ. Chinese SEZs fall under Freeports; "Freeports are fundamentally different from traditional free zones. Instead of export drivers and investment magnets, they are designed as liberalized platforms for diversified economic growth that not only could but should spill over into the national economy." (p. 16) Furthermore, in Table 13 of their report, they say there are 187 zones in China, which is wrong by any measure. A list of zones is provided in the segment "Zones within Zones: The Unique Case of China" which excludes many OCs and provide inaccurate count of other types of zones. Many subsequent publications refer to this report as the reference for using "SEZ" as a generic expression to describe the broad range of modern economic zones. Farole and Akinci (2011) compare worldwide SEZ programs, and distinguish that China launched SEZs on a scale not seen before, attracting FDI, not only supporting the development of export-oriented manufacturing sector, but also serving as a catalyst for sweeping economic reforms that later were extended throughout the country.

The most important report from international authorities is Fu and Gao (2007), which is highly cited, but its contributions are not adhere to. Its main contribution is the explanation of

differing typologies between international organizations and China regarding Chinese zones: SEZs in China should only be used when referring to 60 cities, which are the five SEZs, 15 OCCs, 8 ORCs, 19 OICs and 13 OBCs. These zones are not comparable to EPZs and other zones worldwide. But the Chinese DZs, shown in Figure 2.10, do match the ILO definition of EPZs. This study only included Chinese DZs when estimating the contribution of EPZs to the economy. McCallum (2011) acknowledges the typological distinctions given by Fu and Gao, but then decide to ignore them in their analyses as they "use the broader definition and treat them essentially the same." (McCallum, 2011, p. 6)[24]

Leong (2007) is one of the many studies that investigates the impact of SEZs on economic growth by comparing the cases of India and China, concluding that the increasing the number of SEZs has an insignificant effect on growth, but does not distinguish between SEZs in both countries, giving them ambiguous treatment in analyses.[25] Furthermore, other studies such as Engman, Onodera, & Pinali (2007) published by the OECD recognize that references to SEZs, free zones, free trade zones and EPZ/IPs are often used interchangeably in different countries making the issue of comparing and compiling country statistics challenging. They claim to use "the best data sources that are publicly available. Many of them have been compiled by organisations like ILO and FIAS. [Please note that ILO and FIAS data may not always match perfectly with our definition of an EPZ.]" (p. 11). With regard to Chinese SEZs they concede "they do not fit the definition of an EPZ, the Special Economic Zones (SEZs) in China." (p. 14)

[24] McCallum (2011) is one of the latest ILO publications which keep referring to Fu and Gao (2007) but completely ignore its contributions. Furthermore, this report has two missing or incorrect citations. One of them "Huang and Lin, 2002" does not exist and is missing from references and is in fact a typo copied from Fu and Gao without due diligence.

[25] Other studies referring to comparative analyses between Indian and Chinese SEZs are omitted for these same reasons, and there are plenty.

2.8.2 Studies on Preferential Policies in China

Many studies regarding preferential policies in China focus on FDI. Among these, Cheng and Kwan (2000) were one of the first to use preferential policy variables that include the number of Special Economic Zones, Open Coastal Cities, Economic and Technological Development Zones, and Open Coastal Areas. They estimated the effects of determinants of FDI in 29 regions over 10 years using a Generalized Method of Moments (GMM) framework. Their findings show preferential policy had a positive effect on FDI; a comparison of the magnitude of coefficients reveal that SEZs were 4 to 8 times more effective than the other policy designations (OCCs and ETDZs). Missing from their analysis are other types of OCs, such as OICs, ORCs and OBCs. Since some of the provinces in their sample had these types of omitted OCs, their conclusions could be inaccurate.[26] Park, Li, & Tse (2006) conduct empirical testing utilizing a large sample comprising 27,577 firms over a five-year period (1992-1996) using SEZ and OCC dummy variables. They confirmed that firms located in policy-favored areas are likely to perform better in other regions, although they find open cities to have a positive effect on profitability; weaker positive effects in Guangdong and the east coast provinces indicate that location-specific comparative advantages in these regions are slowly fading. "These regions are becoming less attractive, because of the rapid increase in land and labor costs." [27] (p. 143) Along the same lines, Dean, Lovely, & Wang (2009) model and estimate investor behavior by analyzing Equity Joint Ventures (EJVs) in different provinces including dummy variables for SEZs and OCCs, reflecting the influence of special incentive programs at the province level.[28]

[26] Cheng & Kwan (2000) separate SEZs and OCs into different variables, therefore their conclusions regarding SEZs are correct, but since they grouped OCCs and ETDZs, but excluded other OCs, their results regarding this second variable are incomplete, or incorrect.

[27] The diminishing advantages are reflected in their Model 4. Park, Li, & Tse (2006) however, do not provide a specific list or other evidence of how they classify SEZs and OCs. It is also apparent that they are including DZs and industrial clusters into their analysis and this is not consistent with the definitions of SEZs and OCs provided in this chapter.

[28] FDI incentives are included using a dummy that takes a value of one if there is a special economic zone (SEZ) or open coastal city (OCC) in the province. This variable does not vary during the 1993–1996 period; however,

Results find that preferential policies are highly correlated. Liu, Lovely, & Ondrich (2010) also use SEZ/OCC dummy to untangle wages in FDI decisions in profit function and find positive correlation between SEZs and OCCs. All of these studies find that preferential policies are highly significant when represented as location based variables, even though none of them use an accurate list or definition of these zones and cities as provided earlier in the chapter.

Perhaps the most comprehensive study on the effect of preferential policies on regional disparity is by Démurger, et al. (2002). In their study, they analyze the effects of geographical features, such as access to the sea, elevation, slope, ecological conditions, investment in physical infrastructure and transportation technology, and the effects of preferential policies, on per capita income from 1952 to 1998. In their study, which is conducted at the provincial level, Démurger, et al. (2002) constructed a preferential policy index for each province "based on the number of designated open economic zones in a province and the extent of the preferential treatment." (p. 24) This index includes SEZs, OCCs, ORCs, OBCs, OICs, as well as ETDZs and other DZs, applying different weights to the different zones, and a value of 0 for no open zones. They also provide an extensive list of the zones which is consistent with the list provided earlier in this chapter. Their estimates are an attempt to disentangle the effects of preferential policy from the effects of geography, and thus, they conclude that even without the preferential policies, the regional disparities would still exist because the distinct features of each region would limit development in inland regions while promoting it in those with access to the sea.

While previous studies mentioned here have focused on national or regional levels, Jones, Li, & Owen (2003) point out that government policy that grants preferential statuses to certain areas is enacted at the city level. Thus, analyzing the changes of these cities is the appropriate level to determine the effect of these policies. They estimate growth equations using city-level data and find that the policy of awarding an SEZ status enhances growth substantially,

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they do not define SEZ or OCC, and fail to include other types of OCs. The list is arbitrarily "constructed by authors".

increasing annual growth rates by 5.5 percentage points and the awarding of OCC status increases annual growth rates by three percentage points. They also find that disparity in growth is much larger at the city level: 24% vs 6% provincial. Also, they claim that preferential policies are the cause of regional inequality since they have favored coastal regions at the expense of inland China. “In 2000, the top 5% of the richest people in the country held almost 50% of private bank savings accounts. These nouveaux riches are disproportionately distributed in the coastal region…meanwhile, according to Chinese official sources, approximately 90 percent of the country’s population who live in absolute poverty are located in the western region.” (pp. 7-13)

Yu and Hashmi (2010) conduct an interesting study in which they evaluate the competitiveness of 18 OCCs by building a competitiveness evaluation index using factor analysis for each city and ranking their competitiveness. The index includes factors to measure economic strength, such as GDP, wages, output, investment, retail sales, fiscal budget; and city amenities such as population density, landscape green area, public green area, per capita green area, number of hospital beds, paved road area, number of universities, number of theaters. This study concludes that SEZs and the province capitals have strong local and national support, with rich resources and high-quality investment projects, to create a high GDP, a lot of money to invest in real estate and other fields. Additionally, residents in these cities are comparatively affluent, the year-end balance of savings is relatively high, and are able to promote the development of the social consumer goods retail sales. Beyond these conclusions, Yu and Hashimi (2010) contribute to the understanding of the impact of preferential policies by revealing that SEZs and OCs have several foreign-owned enterprises and SOEs which provide relatively high salaries and benefits for workers, attracting a large number of migrant workers. Furthermore, there are convenient transportation, good industrial base, higher technical and management level, relatively well-developed research culture and education in those cities,

which only carry out foreign trade experience, but also have networks of internal collaboration. Since these cities are all well developed or similarly developed, it can be deduced that the PRC gave preferential status only to those cities that already had a comparative advantage.

Jones, Li, & Owen (2003) and Yu and Hashimi (2010) provide city-level analyses of the impacts of preferential policies, but they only include SEZs and OCCs, while excluding the other types of OCs. The former does highlight differences in growth rates, however, while the latter, gives insight into the factors that contribute towards the competitiveness of these cities.

2.8.3 EPZ Model Studies

There are several studies that examine the effect of EPZs on welfare in a theoretical setting based on Heckscher-Ohlin models (HOM). Most of these studies build on the theoretical framework for analyzing duty free zones in Hamada (1974) that uses a two-sector HOM where the zone generates an inflow of foreign-capital consequently attracting labor from the national economy. Welfare in the Hamada model is dependent on whether protected sectors are capital or labor intensive, the former reducing welfare and the latter increasing welfare. The welfare effects of an EPZ can, therefore, be divided into a "factor terms-of-trade" effect (TOTE) and a "volume-of-trade effect (VOTE)." Subsequent research that confirmed VOTE but ignored TOTE, created a bias against EPZs. Devereux and Chen (1995) contribute by extending these models and showing that TOTE increase welfare while VOTE remains uncertain. Additionally, they demonstrate that zones can increase welfare if regimes rely on quantitative restrictions. Akerman (2009) extends such models to provide a rationale for the general use of EPZs in third world countries, as an alternative to liberalizing international trade for all regions. The Akerman model reduces wage inequality if certain limitations are met, such as restricting upstream industries from operating inside the EPZs.

2.8.4 Case Studies of SEZs and DZs

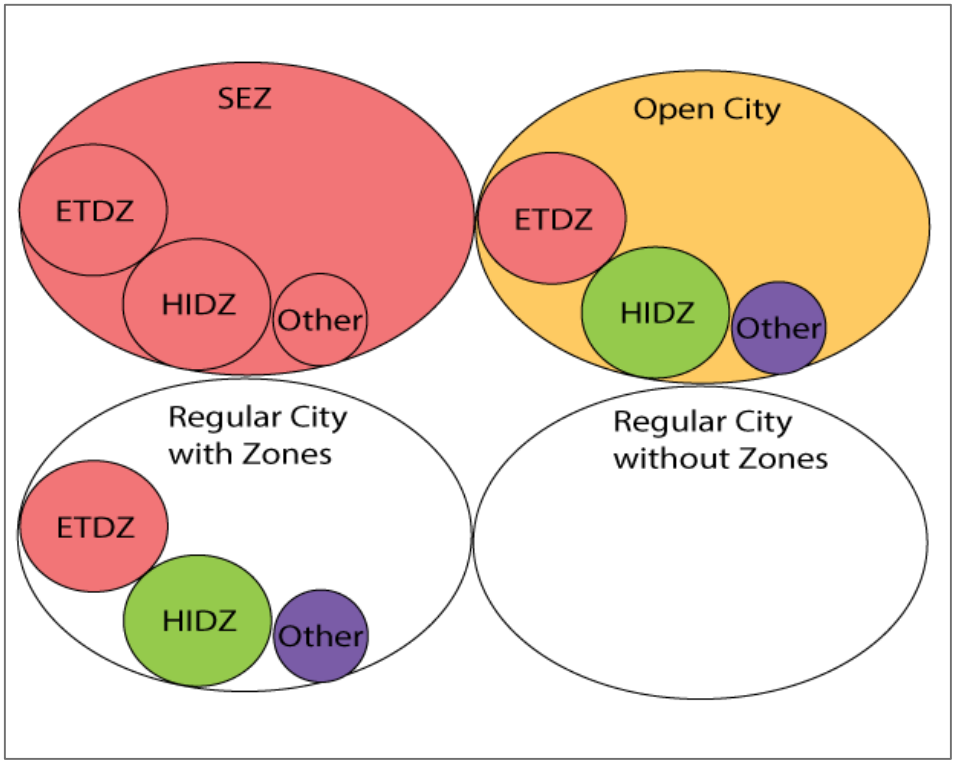
While previous studies focus on several regions, provinces or cities, some studies focus on single cases. Cucco, Beresford, & Prota (2012) perform a case study in which they investigate the role of social class as a determinant of inequality of employee compensation in the Nanjing New and High-Technology Development Zone, which hosts private and state-invested companies operating in advanced industrial sectors such as biotechnology, electronics, nanotechnology, software and IT. This study finds that, within this HIDZ, a college education does not in itself have a significant effect on wages net of the effects of class position, while having obtained a degree in a high-ranking university does. Moreover, they discover that the educational level of a workers parents, (parents with college degrees), had a large and significant effect on the level of wages. This is a singular study examining the effects of social class on wage inequality within the context of a DZ.

Another case study, involving Shenzhen[29], is Xiao (2003) in which an attempt is made at understanding the rapidly expanding non-formal education system, which is concentrated on firm-provided on-the-job training, adult education and training programs at an adult-education center, and self-directed learning without instructor programs which are considered a conscious act to upgrade human capital in a rapidly emerging market economy. Zou et al., (2004) examine the impact of preferential policies on the environment in Hainan SEZ, concluding socio-economic development has led to rapid population growth, as well as pollutants, which induced significant negative impacts on the coastal water quality.

[29] Shenzhen is considered the most successful case of SEZ and therefore has numerous case studies. Xiao (2003) is just one of many that are not referenced here.

2.9 Cities with Preferential Policies

Figure 2.11: Types of cities in China based on preferential policies



Source: Author (2014)

By setting up jurisdictions of preferential policies, SEZs, OCs, and DZs, the PRC has succeeded in creating a distinctive channel to attract FDI, utilize it accordingly to introduce new technologies, as well as interacting with global markets. Also, these preferential policies cover a larger area, have large populations and contain different industrial structures, which make their economic activities much wider than that of export-processing and other free trade zones. In China, SEZs serve as a testing ground for the economic reforms, which are then extended to OCs, and finally to other parts of China. Because of their large scale, SEZs and OCs tend to have other types of zones, such as EPZs, FTZs, and industrial parks within them. While at the

beginning, the incentive structures differed between zones, over time they became more standardized.

In terms of preferential policies, there are four types of cities in China, illustrated in Figure 2.11: (a) SEZs; (b) OCs; (c) Regular Cities with DZs; and (d) Cities without any DZs. The difference between (b) and (c) is that the latter do not enjoy citywide preferential status like OCs, but do, however, offer fiscal incentives within DZs located within their city limits. Even though some cities are "open" to foreign investment by creating DZs, it is only SEZs and OCs that truly enjoy preferential autonomy at the citywide level.

"SEZ as a policy instrument in achieving an overall system transition has far-reaching implications for economic liberalization and development." (Ge, 1999, p. 8) Previous studies regarding the impact of preferential policies have not properly defined and categorized these cities and zones, and have focused mainly on growth, FDI, and employment. There is a literature gap necessitating proper categorization using the definition and terms provided in this chapter.[30] There is also few research done on the impact of these preferential policies on income inequality.[31] This research will analyze preferential policies at the level of citywide jurisdictions (SEZs and OCs) and their impact on income inequality. The importance of income inequality studies is discussed in the following chapter.

[30] Démurger, et al. (2002) provide definitions and terms and distinguish via the usage of weights. Their study, however, is focused at the provincial level and their preferential policy index is a weighted average over a 46 year period.

[31] Akerman (2009) has a model of EPZs that reduces wage inequality, which is more applicable to DZs not citywide studies.

Cucco, Beresford, & Prota (2012) provide a link to the literature gap regarding preferential policies in China and inequality. Even though this is done at the level of a DZ, and focuses on social class as a determinant, it can be scaled to a multiple-city study, which is what is to be done in this thesis.

Chapter 3: Inequality in China

3.1 Introduction

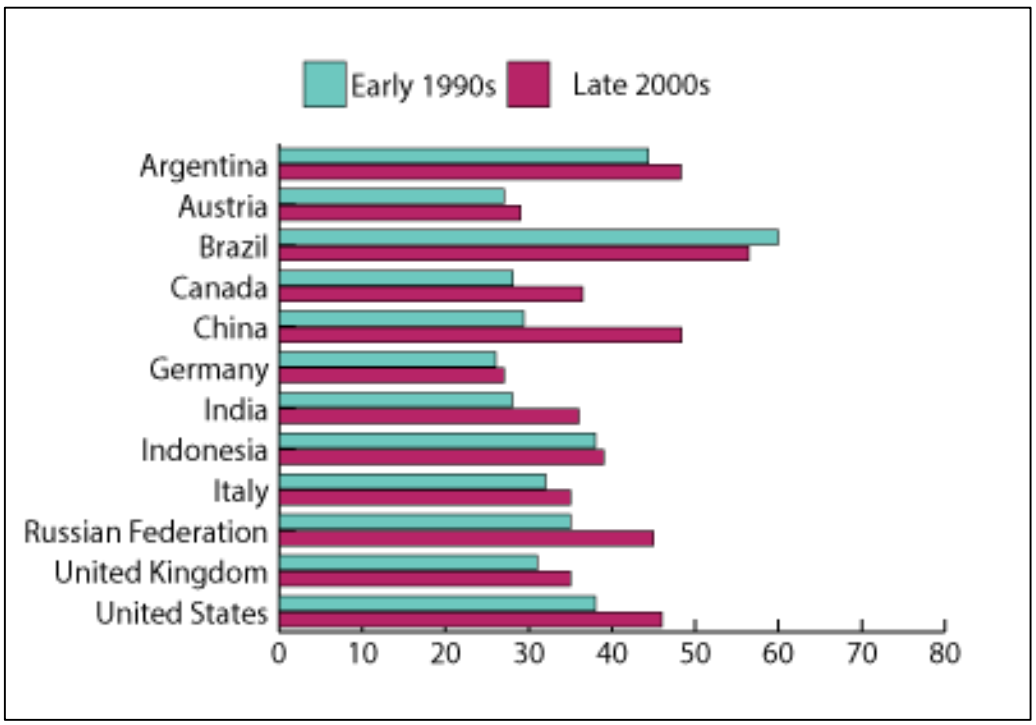
This chapter gives an overview of inequalities of income and education. For each type of inequality, first, the importance of conducting these studies, including different perspectives, for economists and policy makers, is explored. Afterwards, how to measure inequality and a brief review of why some measures of inequality provide qualitatively better information than others is provided. Then, an assessment of inequality in China examining trends and contributions of previous research is performed in order to appraise the current state of this research area. Finally, the contribution of this thesis with relation to these studies is identified.

3.2 Why Income Inequality?

The fundamental purpose of inequality research is to comprehend variances in welfare or living standards. Hoeller et al. (2012) reveal that the trend of rising inequality is a worldwide phenomenon not limited to developing economies, but also prevalent in advanced economies, as shown in Figure 3.1. Many political and business leaders subscribe to the idea that inequality is an unavoidable side effect of rapid growth. Many of them hide behind the theoretical justifications brought upon by the Kuznets hypothesis, which stipulates that as incomes per capita grow, there is an increase in inequality, but as a country becomes developed, inequality should decrease, therefore, reflecting an inverted inequality curve, known as the Kuznets curve. [32] The World Bank's World Development Report 2009 (WDR09) advocates this unbalanced growth with the conviction that it is the only way to move forward.

[32] The Kuznets curve relationship disappears once the fixed effects for each country are accounted for. (Otsubo, Kimura, & Ito, 2009)

Figure 3.1: Change in inequality levels, selected countries

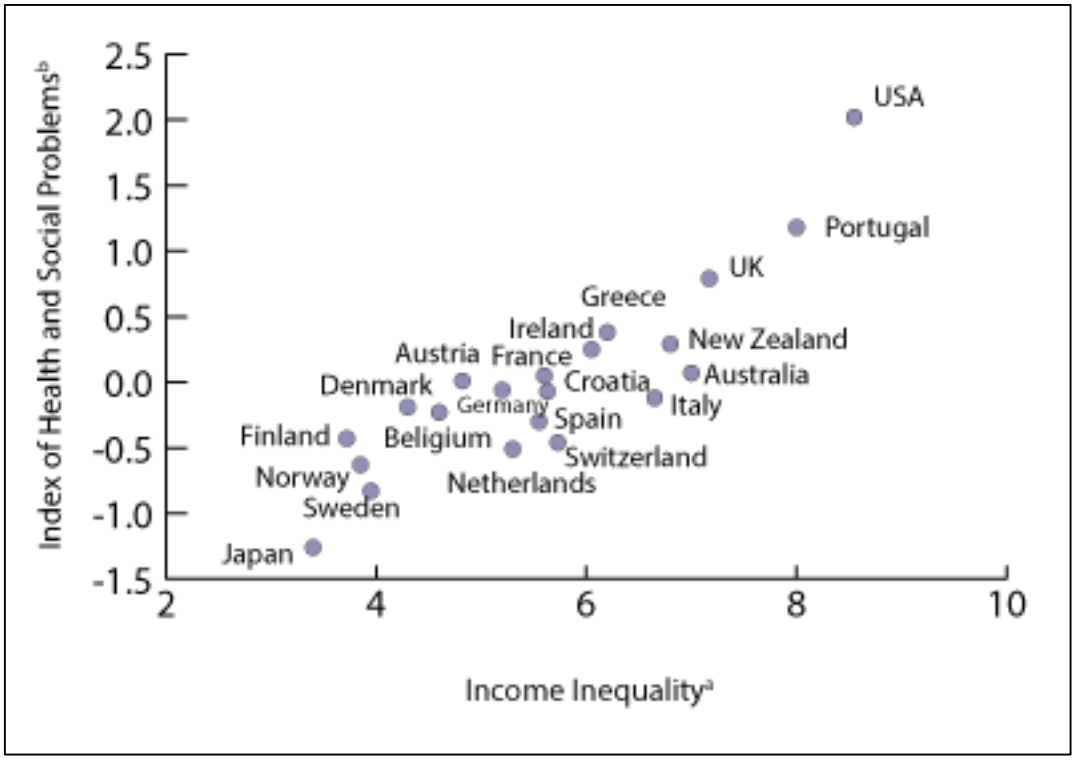


Source: Created by the Author based on UNU-WIDER (2008) and NBS (2008)

Even though, many policy makers have accepted this trade-off between inequality and growth, and usually favor growth over inequality, many economists disagree full-heartedly with the aforementioned notion and call for a more balanced growth strategy than accepting the trade-off as a given. The policy trade-offs and complementarities between growth and inequality are scrutinized in a study of OECD countries undertaken by Koske et al. (2012) in which they demonstrate that some policies can contribute to both lowering inequality and increasing growth, particularly those that enable equal opportunities in the accumulation of human capital[33] and those that reduce labor market dualism.[34]

[33] Policies aimed at making educational achievement less dependent on personal and social circumstances.
[34] Policies that narrow the gap between the protection of permanent and temporary jobs seem to lower income inequality through both a lower wage dispersion and lower unemployment. (Koske, Fournier, & Wanner, 2012, p. 34)

Figure 3.2: Health and social problems vs inequality



Note: a) Average of the 20:20 income inequality published in the UNDP Human development reports for years 2003, 2004, 2005, 2006. b) See The Equality Trust (2014), Sources and Methods, for details on the construction of the Index, and references for all components listed above.

Source: Created by the Author based on The Equality Trust (2014), International Dataset.

Wilkinson and Pickett (2011) measure the relationships between levels of inequality and a variety of health and social problems among the richest countries in the OECD. Their findings suggest that health and social problems, including level of trust, mental illness (including drug and alcohol addiction), life expectancy, infant mortality, obesity, children's educational performance, teenage births, homicides, imprisonment rates, and social mobility, have no apparent correlation with income levels per capita, but instead, are closely correlated with income inequality. An index of all these measures plotted against income inequality for selected countries is shown in Figure 3.2, illustrating that countries with the lowest inequality levels

have the lowest levels of health and social problems and the countries with the highest levels of income inequality have the highest levels of health and social problems. The authors demonstrate that these correlations are true for each of the health and social problems individually. Even though these results only point to a correlation and not causation, it is of the upmost importance to consider the effects of inequality in the design and implementation of future policy as it is an indicator of welfare and standard of living.

3.3 Measuring Income Inequality

Since welfare is composed of a wide range of social and economic factors, income is widely used as a standardized measure which can represent a household's or individual's ability to acquire goods and services. It also allows for analysis from decomposing the different sources of income. However, due to fluctuations in income, some researchers prefer to use consumption as a better indicator of standard of living since households can save money and in times of fluctuating low income, can use savings to consume and keep long-term standards of living. Consumption, also has its limitations since it can also fluctuate with the personal spending and savings habits of individuals and cannot control for infrequent purchases of consumer durables and appraisal of services. Gustafsson, Li, & Sicular (2008) suggest that, in the case of China, financial markets are still undeveloped and therefore households have limited saving and borrowing opportunities, annulling the advantages of using consumption, thus recommending using income as a measurement of welfare.[35]

There are different measurements of inequality. The most popular and commonly used measure is the Gini coefficient, which is based on the lorenz curve. The Gini is defined as twice the area between the line of equality and the Lorenz curve over the total area and is expressed as:

[35] Also, income data are more readily available in China than consumption data.

$$GINI = \frac{2}{n^2\bar{y}}\sum_{i=1}^{n} i\,(y_i - \bar{y}) \quad \text{.....(3.1)}$$

In this equation, and the following three, $\bar{y}$ is mean income, y_i is individual income, and n is the total number of individuals. Two other indices that are also based on the Lorenz curve are the Mehran and Piesch indices, the focuses on low incomes and the latter on the high incomes. Therefore, the Gini is a weighted average of the Mehran and Piesch indices. They are expressed as follows:

$$MEHRAN = \frac{3}{n^3\bar{y}}\sum_{i=1}^{n} i\,(2n + 1 - i)(y_i - \bar{y}) \quad \text{.....(3.2)}$$

$$PIESCH = \frac{3}{2n^3\bar{y}}\sum_{i=1}^{n} i\,(i - 1)(y_i - \bar{y}) \quad \text{.....(3.3)}$$

While the Gini coefficient is most sensitive to income transfers near to the mean the Kakwani index is calculated from the length of the Lorenz curve instead of the area inside the curve. Consequently, this index is more sensitive to income transfers at the extremes.

$$KAKWANI = \frac{1}{2-\sqrt{2}}\left[\left(\frac{1}{n\bar{y}}\sum_{i=1}^{n}\sqrt{y_i^2 + \bar{y}^2}\right) - \sqrt{2}\right] \quad \text{.....(3.4)}$$

Besides measures that are derived from the Lorenz curve, others can be calculated from statistics such as the coefficient of variance (CV) and the standard deviation of logs. Additionally, there is a family of generalized Entropy Measures (GE) which measure inequality as a redundancy in data. These GE measures incorporate a sensitivity parameter, α, that varies in the weight given to inequalities in different parts of the distribution spectrum.[36] The parameter α can be negative or positive. The more positive it is the more sensitive the GE measure is to the top of the distribution. Conversely, a negative value denotes sensibility

[36] Other measures also use sensitivity parameters, such as the Atkinson measure which uses the parameter that ranges from 0 to infinity. For more information on the different measures, please refer to De Maio (2007).

towards the bottom of the distribution. These measures are decomposable because of their additive nature and can be broken down into subgroups to reflect different subareas of a sample or population. The four commonly used GE measures are: GE (–1); GE (0), also known as the Mean Log Deviation (MLD); GE (1), also known as the Theil Index; and GE (2).

The GE measures can be expressed as follows:

$$GE(\alpha) = \frac{1}{N\alpha(\alpha-1)}\sum_{i=1}^{N}\left[\left(\frac{y_i}{\bar{y}}\right)^{\alpha} - 1\right], \text{for real values } \alpha \neq 0,1 \quad (3.5)$$

$$GE(\alpha) = \frac{1}{N}\sum_{i=1}^{N}\left[\frac{y_i}{\bar{y}}\ln\left(\frac{y_i}{\bar{y}}\right)\right], \text{for } \alpha = 1 \quad (3.6)$$

$$GE(\alpha) = \frac{1}{N}\sum_{i=1}^{N}\ln\left(\frac{\bar{y}}{y_i}\right), \text{for } \alpha = 0 \quad (3.7)$$

Morduch and Sicular (2002) show the importance of using different measurements of inequality by conducting decompositions of inequality measures by income source, describing a general, regression-based approach for decomposing inequality. They demonstrate that different indices have different underlying properties and will, therefore, yield qualitatively different answers regarding what determines the overall level of inequality. These differences are mainly referring to the property of uniform additions, which states that measured inequality should fall if everyone in the population receives a positive transfer of equal size.[37] Morduch and Sicular demonstrate that some of the most commonly used inequality measures such as Gini and CV violate the property of uniform additions. After decomposing several inequality measures[38] they show that while decompositions of the Gini and CV may indicate that education contributes positively to inequality and demographic patterns barely affect inequality,

[37] Conversely, inequality should increase if everyone receives an equal, negative transfer.
[38] Conducted on a sample of rural China.

in complete contrast, the Theil-T and alternative decompositions show that education and demographic characteristics strongly reduces inequality.[39] They conclude as follows:

> Information provided by the decomposition of the Theil-T index is thus potentially of greater use to researchers, but it is seldom used. Instead, Gini and CV are the indices of choice to decompose. Yet the results from Gini and CV decompositions are often interpreted as if they yielded the same sort of information as the Theil decomposition, leading to potential misunderstandings of the economic processes which drive income distributions. (p. 105)

In recent years the importance of the Palma ratio in measuring and tracking progress on income inequality has emerged. In a policy brief for the post-2015 SDGs, Doyle and Stiglitz (2014) explain the importance of reducing extreme inequality and advocate for the use of the Palma ratio as the policy relevant measure of inequality. The Palma ratio is the ratio of the richest 10% of the population's share of gross national income divided by the poorest 40%'s share. It measures changes at the extremes, which the Gini does not. Cobham and Sumner (2013) corroborate the stability of the middle 50% share of income across 135 countries over 50 years and their study shows that the middle does indeed hold over time and through various stages of taxes and transfers. They argue that given this tendency, the Palma is a more useful and intuitive measure of inequality for policymakers and citizens to track.

Given the aforementioned measures of income inequality, this dissertation will make use of the Gini, Palma, and General Entropy measures to explore differences in income inequality and have the results be comparable to other research.

3.4 Income Inequality in China

Figure 3.1 shows that inequality has risen in China, similar to other nations, and it is relatively high compared to the OECD average, though not as high as other emerging countries.

[39] Further elaboration of methodology is provided in Chapter 5.

There are a myriad of studies regarding Inequality in China; many of them try to identify whether China is following a Kuznets curve and how soon it will reach the turning point. Although China has experienced extraordinary economic growth during the last 30 years of transition, the income gap between the rich and poor has widened, and many studies regarding economic inequality in China indeed show increased incomes have gone complemented with increased inequality.

Yao (2000) reveals that inequality is driven by the urban-rural income gaps, as well as interprovincial disparities. Over 50% of the rural Gini coefficient can be explained by interprovincial inequality, and over 70% of the interprovincial inequality is explained by inter-zonal inequality. Basically, in terms of income, the coastal area is much better off than the central area, which in turn, is much better off than the western region. Yao (2000) uses Urban and Rural consumer price indices (CPIs) for the years 1978-1996.

Wan (2008, Inequality and Growth) demonstrates that inequality is correlated to growth in China, and concludes that regardless of what time horizon is considered, inequality is always harmful to growth, suggesting policies that reduce the nature of inequality of growth should be adopted. Additionally, comparative advantage defying (CAD) strategies in poorer Western and Central provinces are responsible for the growing regional disparities. "If a government adopts a CAD strategy[40] encouraging enterprises in the economy to ignore the existing advantages of the economy in their entry/choice of industry/technology, these enterprises will not be viable in an open, free, competitive market… [and] its pace of economic growth will be hampered and its real growth rate prevented from reaching full potential." (pp. 62-64) Furthermore, he stipulates that the spatial dependence of inequality is not converging but rather stratifying and heading towards polarization.

[40] Alternatively, comparative advantage following (CAF) strategies facilitate firms' entry/choice of industry/technology according to the economy's existing comparative advantages.

In Wan (2008, Understanding Poverty and Inequality) regression-like decomposition of inequality reveals that the strongest contributors to inequality are variables relating to globalization.[41] The study concludes that social benefits programs targeted at low-income groups in urban China were insufficient and that urban poverty had increased during the 1990s, despite rapid economic growth because of massive layoffs resulting from the restructuring of SOEs, the increase in prices, and the disappearing of state welfare. All of these conclusions, however, are reached without including migrants. Migrants are not included due to the Hukou system in China, which the NBS does not take into account in its surveys.

Studies using the China Household Income Project (CHIP) surveys have an advantage because they include migrants in this sample.[42] Most studies don't include rural migrants in urban areas that have rural Hukous as urban residents. These migrants make less than residents with Urban Hukou and, therefore, by disregarding them the urban-rural income gap is higher. Gustafsson, Li, & Sicular (2010) correct for this by using the CHIP surveys while also using regional price deflators to adjust for different costs of living in provinces.

[41] The effects of global integration on income distribution have been widely studied. Hirano & Otsubo (2012) reveal that while trade is mostly neutral to income inequality, FDI has a negative impact, meaning that it reduces inequality. Stiglitz (2012) argues that although globalization has contributed significantly to growing inequality in many countries, China, which has benefited immensely from export-led growth, "took measures to ensure that significant portions of that increased output went to the poor, some went to provide for public education, and much was reinvested in the economy, to provide more jobs." (p. 75)

[42] Migrants are included from 2002 survey onwards. A list of 28 English publications that conducted research based on CHIP surveys is provided in Gustafsson, Li, & Sicular (2008)

Table 3.1: Measurements of China's inequality from different research (Gini)

Year	Source						
	Gustafsson, Li, & Sicular (2010)	Ravallion and Chen (2007)	World Bank	OECD (2004)	Wu and Perloff (2005)	Chen et al. (2010)	NBS[43]
1988	0.398	0.330	0.382	0.341	0.337	0.346	
1995	0.469	0.415	0.445	0.389	0.382	0.411	
2001		0.447	0.450		0.415	0.439	
2002	0.468					0.451	
2003						0.466	0.479
2007	0.497						0.484
2009			0.420				0.490
2012							0.474

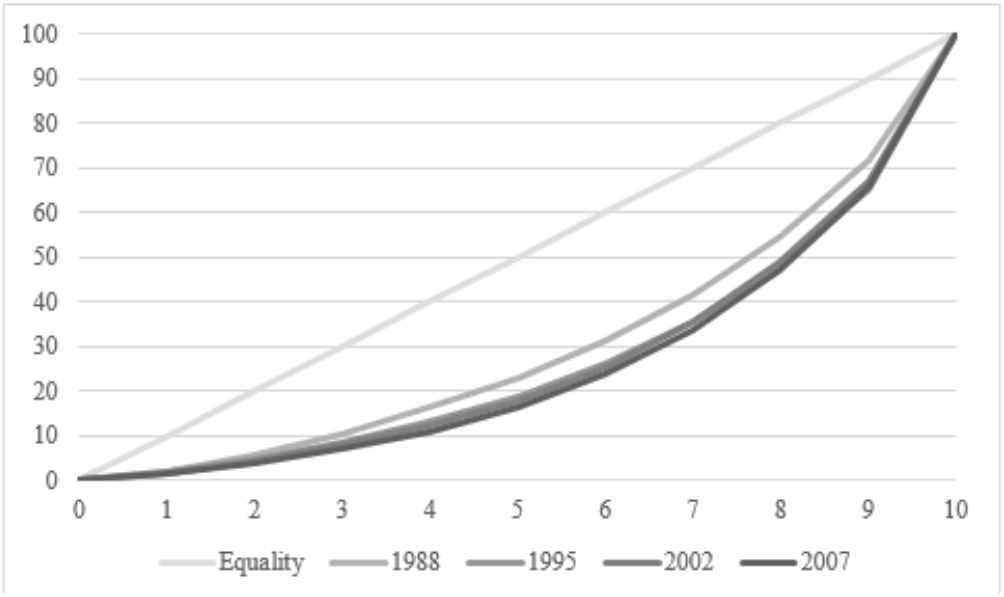
Note: NBS measures were officially released in January 2013. Ravallion and Chen (2007) and Wu and Perloff (2005) estimate income distributions from grouped summary statistics given by the NBS; the former incorporate cost of living adjustments. World Bank measurements for 1988 & 1995 taken from OECD (2004) report. Chen et al. (2010) use different measures and sources to calculate Gini.

Their studies show that, by including rural-to-urban migrants, the overall levels of inequality and poverty in China changed, even though the measured impact is relatively modest. As can be seen in Table 3.1, measurements from Gustafsson, Li, & Sicular are higher than other studies that use official data from the NBS. This is because their definition of income is different from that of the NBS[44], and they include migrants for the 2002 data, as well.

[43] The NBS discontinued releasing Gini coefficients after 2001 because of unreliability issues. Studies therefore had to construct Gini coefficients from partial data released in the Statistical Yearbooks. On January 2013 the NBS released for the first time in 12 years an official Gini measure for 2012, and retrospectively for each year from 2003.

[44] CHIP definition of income includes subsidies and imputed rents from housing that missing from NBS definition of income.

Figure 3.3: Lorenz curves for China



Source: Constructed by Author using CHIP data income data at constant 1988 prices.

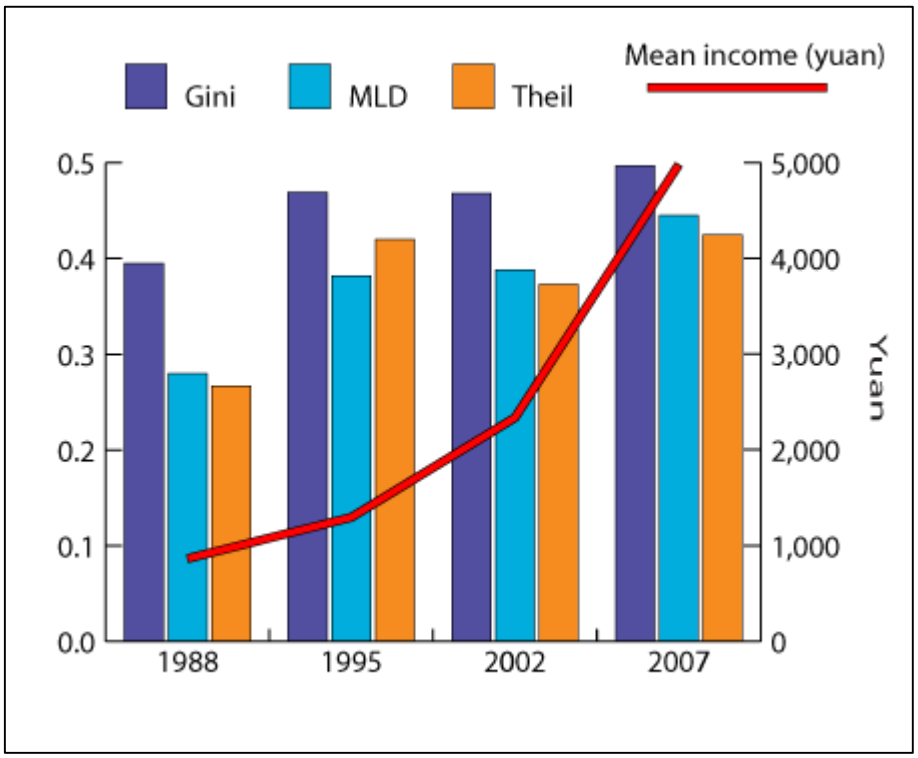
The trend of widening inequality illustrated by the CHIP studies, and displayed through Lorenz curves in Figure 3.3, is that inequality rose sharply from the 1980's to the 1990s, but then as a result of the development of particular equalizing processes, as mentioned in Chapter 2, overall inequality remained largely unchanged between 1995 and 2002.[45] Because of this slight decrease in inequality in 2002 as seen in two of the measures shown in Figure 3.4, it was speculated that perhaps China had indeed reached the Kuznets turning point, where inequality would begin to decline on a negative slope as incomes continued to rise, but the 2007 CHIP

[45] Chen et al. (2010) however show that inequality increased as seen in Table 3.1.

findings proved those contentions to be false, as inequality quickly rose from the 2002 levels across the three measures used.

Gustafsson, Li, & Sicular (2008, 2010) show a double reversal of past trends, where inequality rises from 1988 to 1995, then declines from 1995 to 2002 and then rises again between 2002 and 2007. Puzzlingly, the newly released data from the NBS shown in Table 3.1 implicate that the inequality continued to rise until it peaked in 2009, and has since entered a descent. World Bank data also shows a decrease from 2001 to 2009. This renews debates on whether China has entered the Kuznets turning point. If the subsequent CHIP survey also corroborates this trend then it will consolidate this notion. Researches await the next CHIP survey wave as the results are considered of better quality than official government sources by many.

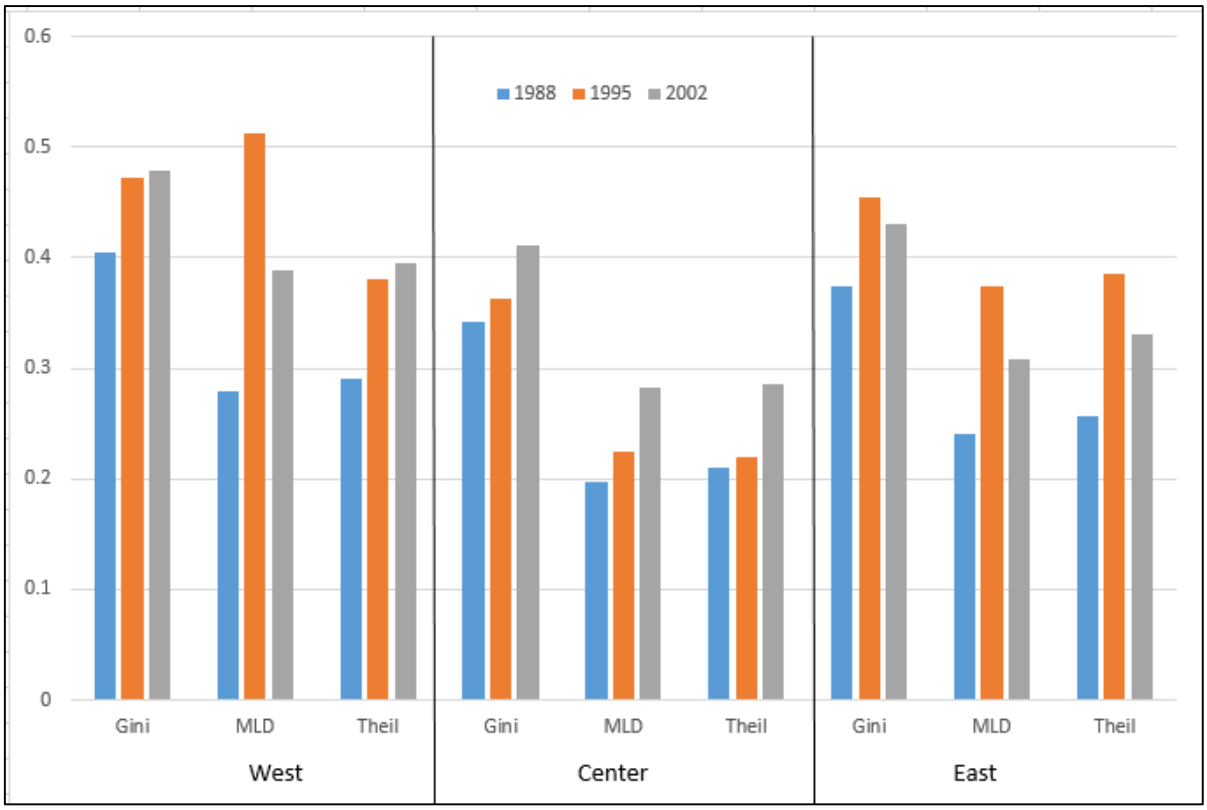
Figure 3.4: National inequality indices for China



Source: Created by the Author based on Gustafsson, Li, & Sicular (2008) Table 2.1 and Li, Luo, & Sicular (2013) Table A1.

The regional disparities seen by Yao (2000) and Wan (2008) are also evident using the CHIP surveys and definitions, seen in Figure 3.5. While mean incomes are consistently higher in the East compared to the Center and West, during the two period changes from 1988 to 1995 and 1995 to 2002, the increase in incomes for the eastern regions is markedly higher than the other two regions, as reflected in the constant 1988 indices, growing 62% and 79% respectively, with a total real growth of 190% from 1988 to 2002 compared with 153% and 139% for central and western regions, respectively.

Figure 3.5: Income inequality indices by region in China



Source: Created by the Author based on Gustafsson, Li, & Sicular (2008) Table 2.4

Furthermore, if you compare inequality measures by region for 1988, the western region has the highest inequality levels, while the central region holds the lowest values. This might indicate that since incomes were already increasing in the east, therefore, inequality had already risen. In 1995, the Center was still the area with the lowest measures of inequality, followed by the East and West, respectively. This trend continues into 2002. It is interesting to note that, in this regional decomposition of inequality, inequality and incomes are not entirely correlated since the central region holds the second highest incomes but the lowest inequality measures of all three regions. Moreover, during the 1995-2002 period, only the eastern region experienced a decline in inequality measures, while the other regions continued to increase.[46]

[46] Studies using NBS data do not show this trend and it is mainly due to the CHIP definition of income.

The existing literature on income inequality in China, focus mainly on the urban-rural divide, or regional disparities. This dissertation will identify and explore inequality gaps within urban China from the perspective of preferential policies. The results from the analysis of Chapter 5 will contribute to the body of literature by providing a further decomposition of urban inequality by indetifying inequality gaps between cities with and without preferential policies, establishing if these gaps are converging or diverging, and identifying causal relationships between having preferential policies and the trends in income inequality.

3.5 Urban China

This section provides a descriptive overview of what is referred to as Urban China. The first section provides a brief outline of China's urbanization progress; China's urban hierarchy and administration system; and some policy implementations during the transition period.

The PRC is currently the world's most populous country, with over 1.35 billion people,[47] over half of which are living in urban areas as shown in Table 3.1. This signifies that around 10% of the world's population live in urban China. While close to 51.3% of the population lives in urban areas today, in pre-reform China, less than 18% of the population was urbanized and over four fifths of the country were living in rural areas. Many of them (70.5%) were employed in the primary sector at the time, but as China embarked on its economic transition, urbanization rates have skyrocketed.

[47] World Bank estimates 1,350,695,000 for 2012; The NBS 2010 Census figures are 1,339,724,852.

Table 3.2: Urban and rural composition of China (% share of population)

	1978	1990	2000	2011
Urban	17.9	26.4	36.2	51.3
Rural	82.1	73.6	63.8	48.7

Source: Constructed by Author based on China Statistical Yearbook 2012

These massive urbanization figures can be misleading for the following reasons: Administratively, the PRC has a complicated urban hierarchy. At the topmost level, China can be divided into 33 regions consisting of 22 provinces, [48] five autonomous regions, four municipalities and two special administrative regions (SARs)[49]. Furthermore, the word "city" is ambiguously used to refer to different levels of administrative divisions, such as provincial level cities, sub-provincial level cities, prefecture-level cities and county level cities as shown in Table 3.2.

.

[48] Taiwan is claimed as the 23rd province of China but is administered and governed by the Republic of China.
[49] Hong Kong SAR and Macao SAR.

Table 3.3.3: Number of cities in China

	1949	1978	1991	1999	2001	2012
Province-level	12	3	3	4	4	4
Deputy-province level	0	0	0	15	15	15
Prefecture-level	54	98	171	221	265	284
County-level	66	92	289	427	393	369
Total	132	193	463	667	677	672

Source: Constructed by Author based on China Statistical Yearbook 2012

While the number of cities has increased dramatically, it does not necessarily reflect a pace of urbanization development, as in the building of new cities. As Chung and Lam (2004) explain, much of China's urbanization is a jurisdictional one, reflected in the increase of "urban" units from three processes: (1) turning prefectures into cities (di gai shi); (2) turning rural counties into cities (xian gai shi); and (3) turning cities and counties into urban districts (xian shi gai qu). These measures have contributed to "inflated urbanization", which is rarely mentioned in the literature but is quite useful in understanding the rise in urban units in such a short period of time. For example, in 1994, 355 (86%) of the 413 county-level cities were formerly rural counties. (p. 947) This means that these new county-level cities are not precisely what one would understand as being properly urbanized units but merely an administrative and jurisdictional change over a piece of territory.[50]

The economic transition of China has brought upon several reforms affecting Urban China. Chapter 2 mentions liberalization policies implemented first through preferential statuses which were then implemented nationwide, mentioned as equalizing policies of the 1990s. The widening implementation of the urban housing reforms is one of these policies which reduced inequality in urban areas. (Li, Luo, & Sicular, 2013) Further measures include the elimination of education fees and the implementation of the Minimum Income Guarantee

[50] This renaming of cities includes the designation of SEZs (jingji tequ), coastal open cities (yanhai kaifang cheng shi), central economic cities (jihua danlie chengshi), deputy-provincial cities fushengjishi), riverine open cities (yanjiang kaifang chengshi), and so on.

System known as “Dibao”. This system was the result of rising urban poverty due to the collapse of the state welfare system and guaranteed employment which left many households in difficult and vulnerable situations. This rise in unemployment and poverty was addressed with the Dibao scheme which would provide a cash transfer to all registered urban households with incomes below a “DB” line designated at the municipality level.[51] “The aim is to close the gap between the recipient’s income and the local DB line (hereafter the ‘DB gap’), so that a minimum income is guaranteed.” (Chen, Ravallion, & Wang, 2006, p. 4) This program started in Shanghai in 1993, and then became national policy in 1999 for urban areas only.[52]

[51] Migrant households did not receive Dibao, and could therefore live below the poverty and DB lines.
[52] Rural Dibao was implemented in late 2000s.

Chapter 4: Preferential Policies and Income Inequality in China's Special Economic Zones and Open Cities

4.1 Introduction

For over three decades, China has experienced remarkable economic growth as it transitions from a state-controlled economy towards a market-oriented economy. However, rising income inequality has arisen across the country over the same period. Preferential policies awarded at the city level to Special Economic Zones (SEZs) and Open Cities (OCs) have functioned as a mechanism for economic reform, where market policies can be implemented in experimental fashion, along with deregulation and liberalization, while drawing foreign direct investment (FDI), encouraging trade performance and fuelling economic growth. Although the influence of preferential policies on growth and FDI has been recognized (Cheng & Kwan, What are the determinants of the location of foreign direct investment? The Chinese experience, 2000; Jones, Li, & Owen, 2003), there is a scarce understanding of their effect on welfare. (Démurger, et al., 2002; Valerio Mendoza, 2014; 2016) This chapter includes analyses from Valerio Mendoza (2016).

The importance of analyzing differences between SEZs and OCs and cities without preferential policies has been argued from different perspectives. Alder, Shao, & Zilibotti (2013) state that preferential policies have been a centerpiece of the Chinese development strategy, have contributed to regional disparities, and consist of clear changes to legal status that are easier to measure compared to other reforms. Additionally, they claim that these type of policies might be propitious for developing countries pursuing growth strategies characterized by a move towards more modern and productive sectors, and open to outside investment. Wang (2013) further contends that the gradual establishment of SEZs across municipalities in China "constitute a unique laboratory" (p. 1) to evaluate the distortions of spatially-targeted programs. Furthermore, Ge (1999) emphasized that preferential policies are

aimed at gauging economic and social instabilities resulting from liberalization policies, and covered not only economic sectors "but also education, R&D, tourism, culture and entertainment, and residence" (p. 1269) Given that rising income inequality has accompanied income growth in China, and preferential policies are regarded as drivers of economic growth, it is important to investigate whether cities with preferential policy status have experienced higher income inequality than other cities.

This chapter follows the methodology of subgroup-decompositions of inequality used by Gustafsson, Li, Sicular, & Yue (2008) and Valerio Mendoza (2014) and aims to decompose urban inequality from the perspective of preferential policies.[53] Decomposing inequality by subgroups was first pioneered by Theil (1972), and further developed by Bourguignon (1979), Foster and Shneyerov (1999, 2000), Shorrocks (1984, 2013), among others. The methodology was later applied by Valerio Mendoza (2014), as seen in Chapter 5, to analyze income inequality in urban areas in China with different types of development zones (DZs); however, the scale, function, and role of preferential policies in DZs are much narrower and limited than in SEZs and OCs. The categorization of cities based on preferential policies in this paper follows the distinction set out by Fu & Gao (2007), whereby SEZs and OCs are differentiated from state-level and provincial-level Development Zones. Other studies such as Zeng (2010) and Alder, Shao, & Zilibotti (2013) acknowledge these distinctions, referring to SEZs as "Comprehensive SEZs" but use the term "SEZ" in a broader sense to include state-level development zones. Similarly, Wang (2013) further expands the term "SEZ" also to include provincial-level zones. The SEZs and OCs have a much larger scale compared to state-level and provincial-level

[53] Innovations to the methodology in Gustafsson, Li, Sicular, & Yue (2008) and Valerio Mendoza (2014) besides the categorization of cities include the addition of statistical significance to differences in income inequality between groups, the creation of two panels of cities to control for sampling variability between surveys, and the separation of cities which were granted preferential policy status as Transition Cities.

development zones; whereby SEZs and OCs are jurisdictions which cover entire cities, while the development zones are small demarcated areas within cities, usually covering a single district. Furthermore, they have received different preferential policy treatments, have different administrative autonomies, and share different development goals.

This chapter investigates whether cities with preferential policies have higher income inequality than cities without preferential policies. The aim of this study is to identify inequality gaps between these groups of cities and establish whether these gaps are converging or diverging. It does not purport to analyze the effects of specific policies on inequality or establish causation between preferential policies and increased income inequality. This chapter focuses only on the cities which enjoy citywide preferential policies and autonomies and does not include other cities and municipalities which have state-level or provincial-level DZs within them.

Given the research on socioeconomic stratifications and inequality, this chapter also investigates whether gaps relating to gender, hukou, age group, and education are evident between cities with and without preferential policies. Once the income and income inequality gaps between cities with and without preferential policies have been established, then differences in the contributors to overall inequality within the subgroups will be explored.

4.2 Income Inequality in Cities with Preferential Policies

How may preferential policies lead to higher or lower inequality? Wang (2013) demonstrates that preferential policies led to a significant increase in the incomes of local workers, although the increase in incomes was larger in municipalities that were given preferential status earlier compared to municipalities that received it later. Additionally, Ge (1999) describes the direct and indirect impacts of preferential policies as having improved employment, resource utilization, capital formation and technology transfer, trade expansion, and economic reforms. However, the mechanism on how these preferential policy statuses can, positively or negatively, influence income disparities has not been explicitly outlined.

Given the larger degree of decentralization and deregulation that is enjoyed by SEZs and OCs, coupled with more liberalized market policies, the rapid gains in economic growth may lead to higher income inequality within these cities since market-oriented systems tend to reward those with higher skills, experience, and performance at much higher rates than those with lower competencies. However, there are several features which may ameliorate the unequal distribution of income such as providing better employment opportunities, social welfare programs, skills upgrading schemes, and greater financing for social spending.

Better employment opportunities are available in SEZs and OCs through higher minimum wages, greater labor mobility, improved employability of workers, and facilitation in the creation and expansion of firms. SEZs and OCs not only have the highest minimum wage levels in China but have had minimum wage laws the for the longest time, as these cities pioneered minimum compensation levels in the 1980s. By law wages in SEZs and OCs were 120-150% higher than the average wage in SOEs. The wages per worker in "state-owned, non-state-owned, and other ownerships were 2.5, 2.2, and 1.5 times higher than the corresponding national average, respectively" (Ge, 1999, p. 89). Wage reform consisted of adopting a social insurance package, a minimum wage, and basing compensation on a base pay, occupational pay

and an allowance (Zeng, 2010, p. 17). Minimum wages assist the living standards of those at the bottom of the pay scale, mainly low-skilled and young workers, decreasing wage dispersion and fomenting aggregate demand through a multiplier effect (OECD, 2011). SEZs and OCs have greater labor mobility as they enjoy less regulation over the employment and dismissal of workers, which can lead to greater competition and higher job quality. Excessive regulations presiding over the firing and hiring of workers can increase the unwillingness of companies to employ workers on a formal basis, exacerbating wage disparities (OECD, 2011). Cities with preferential policies have led the stride in moving from job security towards creating better jobs.

SEZs and OCs have also broken ground on social welfare programs which may help reduce inequality. "Society-wide welfare systems [were developed] in areas of medical care, pension, unemployment compensation, and housing" (Ge, 1999, p. 1281). These included unemployment insurance and severance pay, which may have complemented the downsides of higher labor mobility by alleviating the financial burden of changing or losing a job. Conditional cash transfers such as the minimum income subsidy, "Di Bao[54]" can further redistribute income to poorer households. Additionally, the development of social security, pension, and medical care insurance are additional social assistances which may further reduce disparities. Furthermore, SEZs and OCs were leaders in reforms made in "developing different types of job-training and employment-replacement programs." (Ge, 1999, p. 137) Skills upgrading schemes were crucial in enhancing the employability of the workforce (Xie, Acquisition of technology capability through special economic zones (SEZs): The case of Shenzhen SEZ, 2000) (Liu Z. , Foreign Direct Investment and Technology Spillover: Evidence from China, 2002). While increased returns to education can increase disparities by benefitting

[54] The Di Bao program started in Shanghai in 1993 and then became national policy for urban areas in 1999. Migrant households did not receive Di Bao and could therefore live below the poverty lines. For more on Di Bao refer to Chen, Ravallion, & Wang (2006).

mostly highly skilled workers, skills upgrading programs are associated with higher employment rates and higher average wages (OECD, 2011). Finally, greater fiscal and financial autonomy has allowed SEZ and OCs to reduce their reliance on centralized subsidy programs and diversify their channels of financing for better social spending in the future (World Bank, 2011). Other factors including infrastructure development and policies aimed at improving the business environment may also contribute towards lessening inequality.

4.2.1 Definition of Income

As discussed in Chapter 2, the target variable for measuring inequality in this research will be income, and there can be many definitions of income and also many measurements of inequality. This chapter analyzes inequality of household disposable income per capita, as it not only adjusts household labor income to reflect the different sizes and composition of working-age families, but it also incorporates cash transfers, taxes, and public in-kind transfers. (Stiglitz, Sen, & Fitoussi, 2009) Following the definitions of household disposable income described in Riskin, Zhao, & Li (1995), total household income is calculated using the following elements contained in the CHIP datasets: (1) Cash income from working members, including monthly wage income, contract income, bonus and above-quota income, and other incomes and allowances; (2) Income of the retired members, including retirement pensions, income received from working after retirement, and other income received by retirees such as bonuses, welfare payments and subsidies; (3) Income of the non-working members, which are primarily cash received, minus subsidies received for non-staple food; (4) Income from private/individual enterprises, which is the gross income of enterprises minus the costs of inputs and wages; (5) Income from property, including interest from savings accounts, dividends, bond interest, income from house rent and income from leasing out other goods; (6) Miscellaneous income, including private transfer, alimony and family support, gifts, boarding fees from relatives and friends, and other special income; (7) Subsidies minus taxes and fees paid to government

departments (except housing subsidy and ration coupon subsidy) and income in kind; (8) Ration coupon subsidies[55]; (9) Housing subsidies, in kind; and (10) the rental value of owner occupied housing.[56] Total household disposable income is then divided by the number of members in each household, and each member of the household is assigned the average household disposable income as their individual income. Thus, while the household is the income-receiving unit, individuals are the unit of analysis.[57]

4.2.2 Data and Methodology

This research uses the urban datasets from the nationwide surveys conducted through the China Household Income Project (CHIP). CHIP was created by a survey project team composed of researchers from the Institute of Economics of the Chinese Academy of Social Sciences (CASS), together with associated Chinese and international scholars, and the assistance of the National Bureau of Statistics (NBS), with the goal of tracking the dynamics of income distribution in China. "The survey questionnaires were specifically designed for the purpose of analyzing Chinese household income" (Gustafsson, Li, & Sicular, Inequality and Public Policy in China, 2008, p. 4). There are four waves of CHIP surveys, 1988 (Griffin & Zhao, 1993), 1995 (Riskin, Zhao, & Li, 1995), 2002 (Li S. , 2002), and 2007[58] (Li, Sato, & Sicular, 2013). The urban datasets used in this paper include each over 20,000 individuals and 6,000 households from 70 cities and twelve provinces.

[55] These coupons were used to obtain wheat, rice, edible oils, pork, beef, mutton, poultry, fish, seafood, sugar, and vegetables on a monthly basis.
[56] From 1995 onwards, (3), which mainly consisted of price subsidies, and (8), Ration coupon subsidies, no longer exist due to reforms and are not included in the definition of income. In the 2002, the minimum income subsidy mentioned in Chapter 3 is included.
[57] This is considered the standard practice in the predominant literature on income inequality.

[58] Unfortunately, 5,000 urban households from the CHIP 2007 survey are not included, as this part of data cannot be released. (See Li, Sato, & Sicular (2013)).

The CHIP surveys cover large parts of the country, making them appropriate for spatial decompositions of inequality.[59] Additionally, while most studies do not include rural migrants residing in urban areas who might make less income than other urban residents, the CHIP surveys include migrants in their 2002 and 2007 urban datasets.[60] Furthermore, the definition of income differs from that of the NBS, the former being more comprehensive. Descriptions of the 1988 survey can be found in Eichen & Zhang (1993). Li, Luo, Wei, & Yue (2008) describe the 1995 and 2002 surveys. The 2007 surveys are described in Luo, Li, Sicular, Deng, & Yue (2013)

Out of the 67 cities included in the 1988 survey, only seven of them had city-wide preferential policies, as shown in Table 4.1. They are Dalian, Guangzhou, Nantong, Shenzhen, Wuhan, Wuhu, and Zhanjiang. There were no SEZs or OCs in the western region during this sample year. Less than one-sixth of the sample population for the 1988 urban survey were residing in either an SEZ or OCs. In the 1995 sample, out of the 69 cities, the number of SEZs and OCs doubled to fourteen with the inclusion of Chengdu, Chongqing, Hefei, Kunming, Lanzhou, Taiyuan, and Zhengzhou. SEZs and OCs constituted over twenty-eight percent of the sample, while the large majority of people were residing in cities without citywide preferential policies. The second CHIP survey contains five SEZs and OCs from eastern and western provinces each and four from the western region. In the 2002 dataset, the number of

[59] Many studies use urban–rural-regional weights to make the CHIP data nationally representable. This study does not use weights since it does not focus on the rural datasets and derives measures of inequality from the lowest level, the city district level.

[60] This study only uses the urban datasets for 1988-2007. It does not incorporate the migrant dataset available for 2002 and 2007.

Table 4.1: Preferential policies in CHIP surveys (1988, 1995, 2002, and 2007)

Types of City	Number of Cities	Observations	Percent
1988			
SEZ/Open City	7	4,804	15.1
Non-SEZ/Open City	60	26,939	84.9
Total	67	31,743	100.0
1995			
SEZ/Open City	14	6,137	28.3
Non-SEZ/Open City	55	15,561	71.7
Total	69	21,698	100.0
2002			
SEZ/Open City	15	6,879	33.3
Non-SEZ/Open City	55	13,753	66.7
Total	70	20,632	100.0
2007[a]			
SEZ/Open City	10	9,569	65.2
Non-SEZ/Open City	8	5,104	34.8
Total	18	14,673	100.0
2013			
SEZ/Open City	101	6,702	33.7
Non-SEZ/Open City	24	13,185	66.3
Total	125	19,887	100.0

[a] Approximately 15,000 individuals from the CHIP 2007 survey are not included, this part of the data cannot be released.

Source: Compiled by Author using CHIP data.

cities with preferential policies increased by one to fifteen with the addition of Yichang in Hubei province. A third of the sample population were residing in an SEZ or OC by 2002. Unfortunately, for the 2007 survey, only a subset of the urban dataset is available. From this subset of eighteen cities, ten of them are SEZs or OCs, including four from eastern provinces, and three each from central and western regions. These are Chengdu, Chongqing, Guangzhou, Hefei, Mianyang, Ningbo, Shanghai, Shenzhen, Wuhan, and Zhengzhou.[61] In this subset of the

[61]Mianyang, Ningbo and Shanghai were not included in any of the previous surveys.

last CHIP wave, SEZs and OCs had over sixty-five percent of the sample residents, while the remaining thirty-five lived in cities without preferential policies.

This paper analyzes inequality of household disposable income per capita, as it not only adjusts household labor income to reflect the different sizes and composition of working-age families, but it also incorporates cash transfers, taxes, and public in-kind transfers (Stiglitz, Sen, & Fitoussi, 2009). Following the definitions of household disposable income described in Riskin, Zhao, & Li (1995), total household income is calculated using the following elements contained in the CHIP datasets: (1) Cash income from working members, including monthly wage income, contract income, bonus and above-quota income, and other income and allowances; (2) Income of retired members, including retirement pensions, income received from working after retirement, and other income received by retirees such as bonuses, welfare payments and subsidies; (3) Income of the non-working members, which are primarily cash received, minus subsidies received for non-staple food; (4) Income from private/individual enterprises, which is the gross income of enterprises minus the costs of inputs and wages; (5) Income from property, including interest from savings accounts, dividends, bond interest, income from house rent and income from leasing out other goods; (6) Miscellaneous income, including private transfer, alimony and family support, gifts, boarding fees from relatives and friends, and other special income; (7) Subsidies minus taxes and fees paid to government departments (except housing subsidy and ration coupon subsidy) and income in kind; (8) Ration coupon subsidies[62]; (9) Housing subsidies, in-kind; and (10) the rental value of owner-occupied housing.[63] Total household disposable income is then divided by the number of members in each household, and each member of the household is assigned the average household

[62] These coupons were used to obtain wheat, rice, edible oils, pork, beef, mutton, poultry, fish, seafood, sugar, and vegetables on a monthly basis.
[63] From 1995 onwards, (3), which mainly consisted of price subsidies, and (8), Ration coupon subsidies, no longer exist due to reforms and are not included in the definition of income. In the 2002, the minimum income subsidy "Di Bao" is included. Furthermore, all of the elements of income are not available for the 2007 dataset. For CHIP 2007, household income per capita is used.

disposable income as their individual income. Thus, while the household is the income-receiving unit, individuals are the unit of analysis.[64]

In order to identify inequality gaps between cities with and without preferential policies, this paper measures inequality of household disposable income per capita using the Gini coefficient, the mean log deviation (MLD) and the Theil index. In order to compare changes over time, incomes are inflated and deflated to obtain their values in constant 2002 prices using the urban consumer price index (CPI) for each province from Brandt and Holz (2006). The CPIs for each province provide purchasing power parity (PPP) adjusted indices that may correct for differences in the cost of living between provinces.

Spatial Decomposition of Income Inequality

Following the methodology of subgroup decomposition of inequality described in Gustafsson B. A., Li, Sicular, & Yue (2008), which decomposes national inequality by region (East, Center, and West) and into Urban and Rural, this chapter introduces a new spatial level for the further decomposition of urban inequality based on the types of cities with and without preferential policies.

$$\mathrm{I}(y) = \mathrm{W} + \mathrm{B} = \sum_{p=1}^{2} S_p I_p(y) + \mathrm{B} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.1)$$

Equation 4.1 shows the decomposition of urban inequality into two subgroups: (1) SEZs and OCs; and (2) Cities without preferential policies (Non-SEZ/OCs). In equation 4.1, p is an index for city type (1=SEZ/OC, 2=Non-SEZ/OC) and I(y) is urban inequality, which is composed of W, within-group inequality, and B, between-group inequality. While B is the inequality of the mean incomes between groups, W is the sum of inequality measures for each subgroup weighted using population shares. S_p I_p (y) are the population share and inequality

[64] This is considered the standard practice in the predominant literature on income inequality.

index for each subgroup, such as S_1 I_1 (y) are the population share and inequality index for cities with preferential policies (SEZ/OCs).

$$I_p(y) = W_p + B_p = \sum_{r=1}^{3} S_{pr} I_{pr}(y) + B_p \ldots\ldots\ldots\ldots\ldots\ldots \quad (4.2)$$

Equation 4.2, urban inequality is further decomposed by region. The index r is introduced to represent the three regions (1= West, 2= Center, 3 = East). In this level of decomposition, there are six subgroups three for SEZ/OCs, one for each region, and three for Non-SEZ/OCs. Ip(y) is urban inequality for each subgroup of city types (SEZ/OCs and Non-SEZ/OCs) and Wp and Bp represent the within-group and between-group inequality for each city type, respectively. Following the same logic of disaggregation using population shares, S_pr I_pr (y) are the population shares and inequality index for each city type per region, whereby S12P12(y) are the population share and inequality index for the cities with preferential policies in the central region. Correspondingly, B1 represents the inequality of the mean incomes of cities with preferential policies between regions.

$$\mathrm{I_{pr}(y)} = \mathrm{W_{pr}} + \mathrm{B_{pr}} = \sum_{c=1}^{N} \mathrm{S_{prc} I_{prc}(y)} + \mathrm{B_{pr}} \ldots\ldots\ldots\ldots\ldots \quad (4.3)$$

The lowest level of decomposition in this study is the city. Equation 4.3 uses the index c to represent each of the cities in the CHIP surveys. N, the number of cities, varies with each survey, as discussed earlier. For example, the CHIP 1995 survey has a total of 69 cities while the CHIP 2002 has 70, therefore the value of N will be 69 and 70 for the 1995 and 2002 datasets, respectively. Using the aforementioned three levels of decomposition, differences in inequality measures will be identified between cities with preferential policies (SEZ/OCs) and cities without preferential policies across regions.

Socioeconomic Stratifications

Gender

$$I_p(y) = W_p + B_p = \sum_{g=1}^{2} S_{pg} I_{pg}(y) + B \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{(4.4)}$$

Hukou

$$I_p(y) = W_p + B_p = \sum_{h=1}^{2} S_{ph} I_{ph}(y) + B_p \ldots\ldots\ldots\ldots\ldots\ldots \text{(4.5)}$$

Age

$$I_p(y) = W_p + B_p = \sum_{a=1}^{7} S_{pa} I_{pa}(y) + B_p \ldots\ldots\ldots\ldots\ldots\ldots \text{(4.6)}$$

Education

$$I_p(y) = W_p + B_p = \sum_{e=1}^{4} S_{pe} I_{pe}(y) + B_p \ldots\ldots\ldots\ldots\ldots\ldots \text{(4.7)}$$

Additionally, to explore inequality gaps pertaining to socio-economic stratifications due to gender, hukou , age and education, equations 4.4 to 4.7 will decompose urban income inequality into the corresponding subgroups using the following indices: g for gender (1=male, 2=female); h for hukou (1=urban, 2=rural); a for age (1= 16-20, 2=21-25, 3=26-31, 4=32-38, 5=39-45, 6=46-52, 7=53-59); and e for years of education (1=0-6, 2=7-9, 3=10-12, 4=12 and above).

4.3 The Preferential Policy Dimension

The results for the spatial decomposition of inequality for the CHIP urban surveys at the preferential policy level are displayed in Table 4.2. When comparing the groups of cities with preferential policies (SEZ/OCs) to those without (Non-SEZ/OCs) it can be seen that SEZ/OCs have a higher mean income than Non-SEZ/OCs (¥1,953; ¥6,415; ¥10,341; and ¥28,348 for 1988, 1995, 2002, and 2013, respectively). The income gap, however, has been decreasing,

indicating a convergence of incomes between these two types of cities, and reflecting the diminishing advantages from preferential policies discussed in earlier chapters.

The distribution of income between the two groups also differs. Looking at the lower deciles, one can see that the poorest 40% of the population that reside in SEZ/OCs have a higher share of income (21.2% and 19.9% in 2002 and 2013, respectively) than those residing in Non-SEZ/OCs (18.9% and 18.4% in 2002 and 2103, respectively) [65], while the opposite is true of the richest 40%, who have a higher share in Non-SEZ/OCs (64.4% and 65.1% compared to only 61.8% and 63.0% in SEZ/OCs for 2002 and 2013, respectively), indicating that the distribution of income is slightly better for the poor in cities with preferential policies. The trend from 1995 to 2002 indicates that, even though the highest decile group has decreased its share of income in both types of cities, in SEZ/OCs the eighth and ninth deciles also show decrease, indicating that the richest 30% have decreased their share of total income, while in Non-SEZ/OCs, the eighth and ninth decile groups have increased their share of income.

These opposite trends in income distribution indicate that inequality is rising in Non-SEZ/OCs, while decreasing in SEZ/OCs. The inequality indices in Table 4.2 reflect this trend of decreasing inequality in SEZ/OCs in contrast with rising inequality in Non-SEZ/OCs, from 1995 to 2002, across all three indices shown.

[65] This is also reflected in the gap between inequality indices that are sensitive towards the poorer households, such as the Mehran, A(2) and GE (-1). Results for all measured indices for 2002 are in Appendix 2.

Table 4.2: Income distribution and inequality indices

	Distribution of income, percentage SEZ/OCs				Distribution of income, percentage Non-SEZ/OCs			
Decile	1988	1995	2002	2013	1988	1995	2002	2013
1	5.61	3.49	3.31	2.60	4.77	3.26	2.80	2.4
2	7.04	4.99	4.92	5.45	6.57	4.90	4.30	4.16
3	7.73	5.79	6.01	4.93	7.58	5.83	5.37	5.36
4	8.25	6.71	6.97	6.89	8.34	6.74	6.48	6.47
5	8.88	7.44	7.95	8.63	9.09	7.66	7.67	8.64
6	9.42	8.45	9.00	8.51	9.80	8.72	9.00	7.91
7	10.04	9.53	10.27	10.82	10.6	9.91	10.48	10.41
8	11.11	10.95	12.19	12.17	11.55	11.64	12.45	12.77
9	12.88	13.73	14.87	15.25	13.09	14.75	15.69	15.59
10	19.04	28.91	24.52	24.75	18.62	26.58	25.78	26.31
Gini	0.189	0.337	0.309	0.320	0.202	0.327	0.342	0.353
MLD	0.061	0.203	0.160	0.176	0.072	0.180	0.198	0.220
Theil	0.067	0.268	0.165	0.178	0.078	0.197	0.201	0.229
Mean income (yuan)	1,953	6,415	10,341	28,348	1,627	5,411	9,658	24,567

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

2. Values for income inequality indices were calculated using Eq. 4.1.

3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.

Source: Author's calculation using CHIP data.

Furthermore, inequality is lower in SEZ/OCs for the years 1988, 2002 and 2013, but not for 1995. The 1995 sample reflects the introduction of western cities with preferential policies, which were granted said status in 1992, only three years earlier.[66] Thus, the higher inequality shown in 1995 for SEZ/OCs is solely attributable to the addition of western SEZ/OCs as is revealed in Table 4.3, which shows the regional decomposition of inequality for SEZ/OCs and Non-SEZ/OCs.

[66] Inequality measures for these 5 transitional cities are provided in Appendix 2.

Table 4.3: Income inequality indices by region

	SEZ/OCs				Non-SEZ/OCs			
	1988	1995	2002	2013	1988	1995	2002	2013
East								
Gini	0.197	0.306	0.315	0.332	0.190	0.327	0.331	0.341
MLD	0.066	0.152	0.161	0.183	0.061	0.179	0.185	0.206
Theil	0.074	0.168	0.162	0.194	0.065	0.196	0.186	0.221
Mean income (yuan)	2,077	8,775	13,769	35,187	1,819	7,263	12,730	30,588
Center								
Gini	0.154	0.236	0.268	0.304	0.203	0.254	0.287	0.321
MLD	0.040	0.098	0.124	0.166	0.073	0.110	0.143	0.185
Theil	0.041	0.096	0.121	0.153	0.084	0.108	0.139	0.181
Mean income (yuan)	1,718	4,997	9,016	28,038	1,453	3,903	6,901	19,409
West								
Gini	-	0.380	0.298	0.294	0.180	0.272	0.288	0.312
MLD	-	0.294	0.150	0.149	0.062	0.127	0.144	0.169
Theil	-	0.488	0.153	0.145	0.063	0.152	0.136	0.161
Mean income (yuan)	-	5,833	9,230	24,157	1,684	4,642	8,382	18,611

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

2. Values for income inequality indices were calculated using Eq. 4.2.

3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.

Source: Author's calculation using CHIP data.

While incomes are consistently higher across time and regions for SEZ/OCs over the other cities, inequality is lower for SEZ/OCs only for the eastern and central regions in all survey years, except the East in 1988. The western SEZ/OCs had extreme income inequality measures in relation with the rest of the country for the 1995 sample, with a Gini coefficient of 0.380, more than 10 percentage points higher than the Non-SEZ/OCs for that year. This high

inequality reflected in the West has decreased substantially, and the gap has been reduced to one percentage point. From 1995 to 2002, there has been a decrease in inequality for SEZ/OCs in the West, while the opposite is happening for Non-SEZ/OCs in that region. By 2013, inequality was lowest in SEZ/OCs across all regions.

4.3.1 Preferential Policies and Socioeconomic Stratifications

The results of the subgroup decompositions using equations 4.4 to 4.7 are shown in Tables 4.4 and 4.5. With regard to income, there is a gender gap in both SEZ/OCs and Non-SEZ/OCs, where males had higher incomes than females. However, both males and females had higher incomes in SEZs and OCs than their counterparts in Non-SEZ/OCs. Moreover, females in SEZ/OCs had higher incomes than both males and females in Non-SEZ/. Income inequality for males was lower than females in both types of cities in 2002, indicating less variance in the incomes among males. However, in 2013, females in SEZ/OCs had lower inequality than males in SEZ/OCs. Both males in females in SEZ/OCs had lower income inequality than those in Non-SEZ/OCs. With regard to Hukous, there is an income gap where those with urban Hukous have higher incomes than those with rural Hukous in both types of cities. Both urban and rural Hukou residents have lower inequality measures in SEZ/OCs than in Non-SEZ/OCs.

Table 4.4: Income inequality by socioeconomic subgroups, 2002

	SEZ/OCs		Non-SEZ/OCs	
	Gini	Income	Gini	Income
By gender				
Male	0.309	10,381	0.341	9,696
Female	0.310	10,328	0.343	9,652
By hukou				
Rural	0.296	6,918	0.318	7,542
Urban	0.308	10,407	0.342	9,690
By age				
(16-20)	0.330	9,927	0.344	8,693
(21-25)	0.296	10,870	0.325	10,349
(26-31)	0.290	10,012	0.354	9,111
(32-38)	0.317	9,865	0.321	8,487
(39-45)	0.312	9,690	0.339	9,493
(46-52)	0.309	10,968	0.333	10,812
(53-59)	0.310	12,305	0.344	11,988
By Years of Education				
(0-6)	0.299	8,927	0.324	7,909
(7-9)	0.277	8,605	0.345	7,422
(10-12)	0.300	9,914	0.330	9,861
(>12)	0.306	13,076	0.325	12,255

Source: Author's calculation using CHIP data.

Table 4.5: Income inequality by socioeconomic subgroups, 2013

	SEZ/OCs		Non-SEZ/OCs	
	Gini	Income	Gini	Income
By gender				
Male	0.323	28,694	0.352	24,668
Female	0.317	27,994	0.354	24,466
By hukou				
Rural	0.317	20,977	0.336	17,440
Urban	0.317	28,852	0.348	24,715
By age				
(16-20)	0.295	24,893	0.320	20,249
(21-25)	0.332	27,201	0.387	23,166
(26-31)	0.342	29,661	0.359	24,978
(32-38)	0.314	30,588	0.351	25,317
(39-45)	0.319	29,147	0.346	23,450
(46-52)	0.327	28,594	0.374	26,317
(53-59)	0.318	28,721	0.338	27,880
By Years of Education				
(0-6)	0.301	22,520	0.331	19,311
(7-9)	0.306	24,522	0.329	20,380
(10-12)	0.299	29,150	0.339	25,707
(>12)	0.320	34,199	0.350	30,624

Source: Author's calculation using CHIP data.

In both SEZ/OCs and Non-SEZ/OCs for 2002, the highest income group was also the oldest working-age group (53-59), followed by the second oldest (46-52), which might be reflective of a seniority-based pay scale system. However, this relationship continues down until age group 32-38 in Non-SEZ/OCs, comprising four age groups. In SEZ/OCs, this relationship was disrupted much earlier, and those in younger age groups (21-38) have much higher incomes compared to their counterparts in Non-SEZ/OCs, which might be reflective or merit-based compensation systems being implemented earlier. Furthermore, by 2013, the seniority based relationship between income and age group is still present in Non-SEZ/OCs but no longer evident in SEZ/OCs, where the highest incomes are held by age group 32-38.

Income inequality in SEZ/OCs is lowest for younger groups (21-31), yet these same age groups have among the highest inequality measures in Non-SEZ/OCs. For every single age group, those residing in SEZ/OCs had higher incomes than their counterparts in Non-SEZ/OCs. Income inequality was lower in SEZ/OCs than in Non-SEZ/OCs for every age group.

In 2002, there is a positive relationship between years of education and income in both types of cities. However, residents in SEZ/OCs have higher incomes and lower income inequality for each education group compared to their counterparts in Non-SEZ/OCs. By 2013, the relationship has disappeared only in SEZ/OCs but remains in Non-SEZ/OCs.

4.3.2 Controlling for Sample Variability and Regional Confounding Variables

Because the cities included in the datasets vary between survey years, in an effort to control the effects on observed differences caused by sampling inconsistency, the sample is further analyzed by comparing the changes over time in cities that are present in the 1988 survey and the 2002 survey. This balanced panel of cities is designated "Panel A", shown in Table 4.6. Panel A is separated into three groups: (1) cities that were SEZs and OCs in 1988 and 2002; (2) cities that were not SEZs or OCs in any year; and (3) cities that became an SEZ or OC in between survey years. This latter group is labeled "Transition" cities. In the CHIP datasets, there are five Transition cities: Taiyuan in Shanxi province, Hefei in Anhui province, Zhengzhou in Henan province, Kunming in Yunnan province, and Lanzhou in Gansu province. Panel A includes the five Transition cities; six SEZ/OCs (Dalian, Guangzhou, Nantong, Wuhan, Wuhu, and Zhanjiang); and 24 cities that are neither SEZs nor OCs.

Table 4.6: Panel A: 1988-2002

Types of City	Number of Cities	Observations	Percent
1988			
SEZ/Open City	6	4,415	20.8
Pre-Transition	5	4,218	19.9
Non-SEZ/Open City	24	12,569	59.3
Total	35	21,202	100.0
1995			
SEZ/Open City	6	2,971	21.9
Post-Transition	5	2,134	15.8
Non-SEZ/Open City	24	8,446	62.3
Total	35	13,551	100.0
2002			
SEZ/Open City	6	2,842	22.0
Post-Transition	5	2,355	18.2
Non-SEZ/Open City	24	7,712	59.7
Total	35	12,909	100.0

Source: Compiled by Author using CHIP data.

Table 4.7: Panel B: 1988-2007

Types of City	Number of Cities	Observations	Percent
1988			
SEZ/Open City	2	2,367	39.7
Pre-Transition	2	1,436	24.1
Non-SEZ/Open City	3	2,159	36.2
Total	7	5,962	100.0
1995			
SEZ/Open City	2	1,548	46.3
Post-Transition	2	589	17.6
Non-SEZ/Open City	3	1,206	36.1
Total	7	3,343	100.0
2002			
SEZ/Open City	2	1,363	41.6
Post-Transition	2	875	26.7
Non-SEZ/Open City	3	1,035	31.6
Total	7	3,273	100.0
2007			
SEZ/Open City	2	2,122	33.5
Post-Transition	2	2,013	31.8
Non-SEZ/Open City	3	2,192	34.7
Total	7	6,327	100.0

Source: Compiled by Author using CHIP data.

Given the data limitation with the 2007 survey[67], a separate group, "Panel B", was created to reflect cities that are in 1988 and in 2007. Panel B, as shown in Table 4.7, includes two SEZ/OCs (Guangzhou and Wuhan); two Transition cities (Hefei and Zhengzhou); and three Non-SEZ/OCs (Bengbu, Nanjing, and Wuxi). In order to compare changes over time, incomes are inflated and deflated to obtain their values in constant 2002 prices using the urban consumer price index (CPI) for each province from Brandt and Holz (2006). The CPIs for each province provide purchasing power parity (PPP) adjusted indices that may correct for differences in the cost of living between provinces.

[67]Given that over 15,000 individuals from the CHIP 2007 survey are not included in this study since this part of the data cannot be released, the 2007 partial dataset is missing the majority of cities without preferential policies. Furthermore, the 2007 dataset does not allow for the decomposition of total household income into the different components described in Section 4. The definition of income for this survey is different since the 2007 survey was also a part of the larger RUMiC (Rural-Urban Migrants in China) survey project. The sampling procedure and survey method for the 2007 migrant survey were described in detail in Kong (2010).

$$I(y) = W + B = \sum_{t=1}^{3} S_t I_t(y) + B \ldots\ldots\ldots\ldots\ldots\ldots (4.12)$$

$$I_t(y) = W_t + B_t = \sum_{r=1}^{3} S_{tr} I_{tr}(y) + B_t \ldots\ldots\ldots\ldots\ldots (4.13)$$

To this purpose, equation 4.12 uses the index t to decompose urban inequality into three groups used for Panels A and B (1= SEZ/OC; 2= Transition; 3=Non-SEZ/OC). Equation 4.13 further decomposes the three groups by region (1= West, 2= Center, 3 = East), creating a total of nine subgroups.

Panel A: 1988-2002

Table 4.8 shows the results for the decomposition of urban inequality in Panel A, using Equation 4.12, into three subgroups. Also displayed is the distribution of income across income decile groups, ordered from the poorest ten percent to the richest. At a glance, one can see that income growth happened in all three subgroups. Mean incomes remained highest in the SEZ/OCs, but lowest in the Transition cities, which started in 1988 with the lowest incomes of the three groups. The transition group increased its income from 1988-2002 by 112 percent, compared with 143 percent in Non-SEZ/OCs and 152 percent in SEZ/OCs. The income gap between SEZ/OCs and Non-SEZ/OCs has decreased from 13 percent higher in 1995 to nine percent higher in 2002. On the other hand, the income gaps between Transition cities and the other groups of cities have widened. Mean incomes in Transition cities went from being ten percent and six percent lower than mean incomes in SEZ/OCs and Non-SEZs respectively in 1988, to 24 percent and 17 percent lower than SEZ/OCs and Non-SEZs respectively in 2002.

Table 4.8: Income distribution and inequality, Panel A: 1988-2002

	Distribution of income, percentage SEZ/OCs			Distribution of income, percentage Transition			Distribution of income, percentage Non-SEZ/OCs		
Decile [a]	1988	1995	2002	1988	1995	2002	1988	1995	2002
1	5.68	3.47	3.19	4.89	3.72	3.59	4.39	3.57	2.84
2	7.26	5.01	4.80	6.73	5.00	5.15	6.42	4.83	4.27
3	8.01	5.95	5.93	7.90	5.85	6.30	7.44	5.71	5.37
4	8.56	6.84	6.87	8.71	6.61	7.24	8.14	6.61	6.54
5	9.11	7.80	7.82	9.28	7.30	8.28	8.87	7.46	7.76
6	9.65	8.86	9.00	9.98	8.07	9.20	9.59	8.41	9.05
7	10.29	10.05	10.43	10.64	8.94	10.59	10.42	9.75	10.43
8	11.08	11.82	12.04	11.43	10.13	12.30	11.74	11.82	12.45
9	12.55	15.23	14.93	12.74	11.70	14.83	13.78	15.51	15.81
10	17.82	24.98	25.00	17.70	32.68	22.52	19.20	26.33	25.48
Gini	0.172	0.311	0.316	0.186	0.356	0.285	0.219	0.328	0.339
MLD	0.052	0.164	0.166	0.062	0.253	0.136	0.081	0.173	0.196
Theil	0.058	0.170	0.170	0.065	0.517	0.139	0.082	0.187	0.195
Mean income (yuan)	4,758	7,696	11,992	4,262	6,609	9,056	4,515	6,798	10,971

Note: All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

[a] The share of total household disposable income per capita by each decile (ten quantiles).

Source: Author's calculation using CHIP data.

With regard to the distribution of income, from 1988 to 1995, SEZ/OCs experienced a decrease in the share of income for the lowest seven income decile groups, while the richest thirty percent experienced an increase in theirs. For Non-SEZ/OCs, the lowest eight income decile groups experienced a decrease in their share of income, while only the richest 20 percent saw an increase. In Transition cities, only the richest ten percent increased their share of income, while the remaining 90 percent of the sample population experienced a decrease. In 1995, it seemed that Transition cities performed poorly in income distribution compared to the other groups, but by 2002 the tables had turned. From 1995 to 2002, the lowest four deciles saw a

decrease in their share of income in Non-SEZ/OCs, and the lowest three deciles decreased in SEZ/OCs, but only the lowest decile had a decrease in Transition cities. Similarly, from 1995 to 2002, SEZ/OCs saw a decrease in the share of the poorest 40 percent from 21.3 percent to 20.8 percent; Non-SEZ/OCs had a decrease in the share of the poorest 40 percent, from 20.7; on the other hand, Transition cities were the only group to increase the share of the poorest 40 percent, from 21.2 percent to 22.3 percent. By 2002 Transition cities had a higher share of income for each of the lowest five decile groups than the other groups of cities, while Non-SEZ/OCs had the lowest share for the lowest five deciles. At the other extreme, while the richest decile slightly increased its share in SEZ/OCs, to 25 percent, the highest decile saw a decrease of three percent in Non-SEZ/OCs. However, the largest reduction in the share of the highest income group was in Transition cities, in which the share was reduced by over thirty percent. In light of these trends, the ratio of the richest 10 percent to the poorest 40 percent increased from 1.17 in 1995 to 1.20 in 2002 for SEZ/OCs, and increased from 1.27 in 1995 to 1.34 in 2002 for Non-SEZ/OCs, but decreased from 1.54 in 1995 to 1.01 in Transition cities.

Income inequality indices were lower in SEZ/OCs than Non-SEZ/OCs for every year, across all indices. However, Transition cities had the lowest inequality indices for 2002. While the change in inequality from 1988 to 2002 was positive, the Transition cities had the smallest increase across all measures (Gini=53%; MLD=119%; Theil=114%) compared to Non-SEZ/OCs (Gini=55%; MLD=142%; Theil=135%) and SEZ/OCs (Gini=84%; MLD=219%; Theil=193%) Moreover, from 1995 to 2002, an increase in inequality was evident for both SEZ/OCs (Gini=2%; MLD=1%; Theil=0%) and Non-SEZ/OCs (Gini=3%; MLD=13%; Theil=4%), the Transition cities were the only group to see a decrease in the inequality indices (Gini= -20%; MLD= -46%; Theil= -73%).

Table 4.9: T-Tests for Panel A: 1988-2002

1988 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	12,569	0.16058	0.00032	0.03611	16.3360	0.0000***
Transition	4,218	0.17190	0.00071	0.04639		
Total	16,787	0.16343	0.00030	0.03926		
Non-SEZ/OCs	12,569	0.16058	0.00032	0.03611	6.0669	0.0000***
SEZ/OCs	4,415	0.16490	0.00077	0.05139		
Total	16,984	0.16170	0.00031	0.04068		
1995 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	8,446	0.25469	0.00097	0.08887	7.2450	0.0000***
Transition	2,134	0.24030	0.00098	0.04525		
Total	10,580	0.25178	0.00080	0.08216		
Non-SEZ/OCs	8,446	0.25469	0.00097	0.08887	5.6028	0.0000***
SEZ/OCs	2,971	0.24514	0.00084	0.04555		
Total	11,417	0.25220	0.00075	0.08000		
2002 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	7,712	0.26767	0.00042	0.03674	19.9385	0.0000***
Transition	2,355	0.28304	0.00026	0.01266		
Total	10,067	0.27126	0.00033	0.03337		
Non-SEZ/OCs	7,712	0.26767	0.00042	0.03674	6.0899	0.0000***
SEZ/OCs	2,842	0.26315	0.00045	0.02404		
Total	10,554	0.26645	0.00033	0.03385		

Note: *** indicates significance at 1% confidence level.

Independent t-tests were run on Panel A to determine whether the mean difference in income inequality in the three groups is statistically significant. The results, shown in Table 4.9, show that for all the sample years the difference in measured income inequality between SEZ/OCs and Non-SEZ/OCs, and between Transition cities and Non-SEZ/OCs, are statistically significant at a one percent confidence level.

The decomposition by region using Equation 4.13, shown in Table 4.10, reveals, firstly, that there are no eastern Transition cities or western SEZ/OCs in this panel. Secondly, mean incomes are higher for SEZ/OCs than Non-SEZ/OCs across the two regions and for every year, with the exception of 1988 in the east. Moreover, mean incomes are also higher for the Transition cities for every year and the two regions than Non-SEZ/OCs. Of note is that from 1995 onwards, mean incomes in Transition cities were higher than SEZ/OCs as well.

In the eastern region, from 1988 to 2002, mean incomes in SEZ/OCs increased by 183 percent, while in Non-SEZ/OCs mean incomes increased by 163 percent. In the central region, mean incomes increased 93 percent in SEZ/OCs, 127 percent in Transition cities, and 102 percent in Non-SEZ/OCs. Lastly, in the western region, mean incomes in Transitions cities increased by 96 percent, while in Non-SEZ/OCs incomes increased by 104 percent. Furthermore, the income gaps between SEZ/OCs and Non-SEZ/OCs converged in the east (from 11 percent in 1995 to four percent in 2002), but diverged in the central region (from 17 percent in 1995 to 22 percent in 2002). The income gap between Transition cities and SEZ/OCs converged in the central region (from 11 percent in 1995 to four percent in 2002). Similarly, the income gaps between Transition cities and Non-SEZ/OCs declined from 1995 to 2002, from 29 percent to 27 percent in the central region, and from 62 percent to less than one percent in the western region.

Table 4.10: Inequality by region, Panel A: 1988-2002

	SEZ/OCs			Transition			Non-SEZ/OCs		
	1988	1995	2002	1988	1995	2002	1988	1995	2002
East									
Gini	0.180	0.291	0.315	-	-	-	0.209	0.314	0.323
MLD	0.058	0.135	0.163	-	-	-	0.072	0.159	0.176
Theil	0.066	0.146	0.165	-	-	-	0.074	0.166	0.176
Mean income (yuan)	4,871	9,439	13,792	-	-	-	5,049	8,484	13,259
Center									
Gini	0.156	0.236	0.256	0.199	0.230	0.287	0.203	0.221	0.286
MLD	0.040	0.106	0.111	0.071	0.092	0.138	0.074	0.081	0.146
Theil	0.042	0.091	0.105	0.080	0.089	0.142	0.075	0.081	0.135
Mean income (yuan)	4,569	5,180	8,831	4,049	5,739	9,201	3,594	4,434	7,245
West									
Gini	-	-	-	0.167	0.471	0.282	0.123	0.224	0.252
MLD	-	-	-	0.049	0.432	0.131	0.027	0.085	0.108
Theil	-	-	-	0.049	0.900	0.133	0.030	0.096	0.105
Mean income (yuan)	-	-	-	4,488	7,715	8,816	4,317	4,775	8,791

Note: All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

Source: Author's calculation using CHIP data.

Income inequality indices for the eastern SEZ/OCs are lower than eastern Non-SEZ/OCs for every sample year. The income inequality gap, however, converged from 1988 (Gini=14%; MLD= 19%; and Theil= 11%) to 2002 (Gini=2%; MLD= 7%; and Theil= 6%). For the central region, in 1988 and 2002 inequality indices were lowest in SEZ/OCs compared to Non-SEZ/OCs and Transition cities. The income inequality gap between SEZ/OCs and Non-SEZ/OCs widened for most indices from 1995 (Gini=7%; MLD= 31%; and Theil= 12%) to 2002 (Gini=10%; MLD= 24%; and Theil= 22%). From 1988 to 2002, the Gini, MLD, and Theil indices in central Transition cities increased by 44 percent, 94 percent, and 78 percent

respectively, compared to 41 percent, 97 percent, and 80 percent respectively in central Non-SEZ/OCs. From 1995 to 2002, however, the Gini, MLD, and Theil indices in central Transition cities increased by 25 percent, 50 percent, and 60 percent respectively, compared to 29 percent, 80 percent, and 67 percent in central Non-SEZ/OCs. While income inequality in Transition cities increased at a lower proportion than Non-SEZ/OCs in two of the three indices from 1988 to 2002, from 1995 to 2002 inequality in Transition cities increased at a lower rate than Non-SEZ/OCs across all indices. To reiterate, from 1995 to 2002 central Non-SEZ/OCs increased their Gini, MLD, and Theil indices at a higher rate, by more than four percent, 30 percent, and 7 percent respectively, compared to central Transition cities.

Lastly, in the western region, income inequality indices are lower in Non-SEZ/OCs than in Transition cities for every year. However, the percent change from 1988 to 2002 for the Gini, MLD, and Theil indices, was 69, 167, and 171 respectively for Transition cities, and 105, 300, and 250 respectively for Non-SEZ/OCs. Furthermore, western Transition cities reduced income inequality indices from 1995 to 2002, while Non-SEZ/OCs saw increased income inequality. From 1995 to 2002, Gini, MLD, and Theil indices in Transition cities decreased by 40 percent, 70 percent, and 85 percent respectively, compared to an increase of 13 percent, 27 percent, and 9 percent in Non-SEZ/OCs.

Panel B: 1988-2007

Table 4.11: Income distribution and inequality, Panel B: 1988-2007

	Distribution of income, percentage SEZ/OCs				Distribution of income, percentage Transition				Distribution of income, percentage Non-SEZ/OCs			
Decile [a]	1988	1995	2002	2007	1988	1995	2002	2007	1988	1995	2002	2007
1	5.6	2.9	2.9	2.5	4.9	4.9	3.9	3.1	5.8	4.9	3.1	2.5
2	7.1	4.3	4.4	3.8	6.0	6.4	5.3	4.8	7.2	6.0	4.9	4.3
3	7.7	5.2	5.5	5.1	7.2	7.2	6.5	5.8	7.7	7.0	6.3	5.2
4	8.3	6.1	6.6	5.9	8.7	8.0	7.5	7.0	8.4	7.9	7.2	6.5
5	8.8	7.1	7.4	7.5	9.2	8.8	8.2	7.5	9.0	8.7	8.2	7.2
6	9.5	8.4	8.8	8.8	10.0	9.7	9.2	8.9	9.7	9.7	9.1	9.1
7	10.2	10.4	10.4	10.5	10.9	10.7	10.5	10.1	10.4	10.2	10.8	11.1
8	11.4	12.9	12.2	12.8	11.9	11.9	11.9	11.7	11.5	12.2	12.3	11.1
9	13.0	16.9	15.9	16.2	13.2	13.9	14.7	14.8	13.2	13.9	14.8	15.7
10	18.5	25.9	25.9	26.8	17.9	18.4	22.4	26.5	17.3	19.4	23.3	27.2
Gini	.189	.353	.343	.369	.206	.216	.277	.332	.176	.225	.298	.360
MLD	.061	.214	.196	.233	.072	.076	.130	.190	.050	.081	.150	.223
Theil	.070	.206	.194	.236	.074	.076	.139	.220	.051	.083	.149	.227
Mean income (yuan)	4,893	8,373	13,806	19,192	3,810	6,372	9,211	14,223	4,354	6,130	11,444	15,973

Note: All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

[a] The share of total household disposable income per capita by each decile (ten quantiles).

Source: Author's calculation using CHIP data.

The results of the decomposition for urban inequality in Panel B, using equation 4.12, are displayed in Table 4.11. Mean incomes are highest in SEZ/OCs in every year, compared to Transition cities and Non-SEZ/OCs. SEZ/OCs also had the highest increase in mean incomes, growing 292 percent from 1988 to 2007, compared to 273 percent for Transition cities and 267 percent in Non-SEZ/OCs. The trends in income growth differ between the groups of cities. SEZ/OCs had diminishing growth rates, increasing 71 percent from 1988 to 1995, then 65 percent from 1995 to 2002, and 39 percent from 2002 to 2007. Non-SEZ/OCs exhibit an inverted U-shape curve, growing 41 percent from 1988 to 1995, followed by 87 percent from

1995 to 2002, and 40 percent from 2002 to 2007. Conversely, Transition cities followed a U-shaped curve, increasing 67 percent from 1988 to 1995, 45 percent from 1995 to 2002, and 54 percent from 2002 to 2007. Mean incomes in SEZ/OCs were 20 percent higher than Non-SEZ/OCs in 2007, a slight decrease from 21 percent in 2002. The income gap between Non-SEZ/OCs and Transition cities decreased from 20 percent in 2002 to 11 percent in 2007.

Even though mean incomes were lowest in Transition cities compared to the other two groups, the distribution of said income was more favorable to poorer households in Transition cities. While the poorest four deciles had a lower share in Transition cities (26.8 percent) in 1988 compared to SEZ/OCs (28.7 percent) and Non-SEZ/OCs (29.1%), for each of the following years, the poorest 40 percent had a higher share in Transition cities than in the other groups. The share of the richest two income deciles was lower in Transition cities than SEZ/OCs and Non-SEZ/OCs from 1995 to 2007. Correspondingly, while inequality indices were highest in Transition cities in 1988, for each of the subsequent three surveys, inequality indices were lower than in SEZ/OCs and Non-SEZ/OCs. Furthermore, from 1988 to 2007, Transition cities increased their Gini, MLD, and Theil indices by 61 percent, 164 percent, and 197 percent respectively, compared to 95 percent, 282 percent, and 237 percent in SEZ/OCs, and 105 percent, 346 percent, and 345 percent in Non-SEZ/OCs. Independent t-tests for Panel B are shown in Table 4.12. The results for each survey year are statistically significant at a one percent confidence level, with the exception of the difference in measured income inequality between Transition Cities and Non-SEZ/OCs in 2002, which was only statistically significant at a ten percent confidence level.

Table 4.12: T-Tests for Panel B: 1988-2007

1995 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	1,206	0.19075	0.00128	0.04435	13.2759	0.0000***
Transition	589	0.21508	0.00019	0.00461		
Total	1,795	0.19873	0.00090	0.03819		
Non-SEZ/OCs	1,206	0.19075	0.00128	0.04435	32.7662	0.0000***
SEZ/OCs	1,548	0.23648	0.00073	0.02858		
Total	2,754	0.21645	0.00082	0.04284		
2002 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	1,035	0.27738	0.00049	0.01560	1.8152	0.0696*
Transition	875	0.27624	0.00037	0.01081		
Total	1,910	0.27686	0.00031	0.01363		
Non-SEZ/OCs	1,035	0.27738	0.00049	0.01560	6.2447	0.0000***
SEZ/OCs	1,363	0.27188	0.00067	0.02483		
Total	2,398	0.27425	0.00044	0.02151		
2007 (Gini)	Obs	Mean	Std. Err.	Std. Dev.	t-stat	p-value
Non-SEZ/OCs	1,396	0.31815	0.00069	0.02572	2.6837	0.0073***
Transition	2,013	0.31970	0.00004	0.00185		
Total	3,409	0.31907	0.00028	0.01654		
Non-SEZ/OCs	3,052	0.32012	0.00036	0.01963	12.9947	0.0000***
SEZ/OCs	2,805	0.32893	0.00059	0.03135		
Total	5,857	0.32434	0.00034	0.02628		

Notes: 1. *** and * indicate significance at 1% and 10% confidence levels, respectively. 2. Results for 1988 have been omitted due to space limitation.

Table 4.13: Inequality by region, Panel B: 1988-2007

	SEZ/OCs				Transition				Non-SEZ/OCs			
	1988	1995	2002	2007	1988	1995	2002	2007	1988	1995	2002	2007
East												
Gini	0.219	0.271	0.299	0.286	-	-	-	-	0.176	0.218	0.268	0.327
MLD	0.081	0.121	0.152	0.139	-	-	-	-	0.049	0.077	0.117	0.178
Theil	0.096	0.119	0.143	0.134	-	-	-	-	0.051	0.078	0.120	0.190
Mean income (yuan)	5,143	12,881	19,426	26,087	-	-	-	-	4,368	6,639	12,930	18,162
Center												
Gini	0.160	0.241	0.249	0.356	0.206	0.216	0.277	0.332	0.177	0.176	0.300	0.350
MLD	0.042	0.114	0.108	0.215	0.072	0.076	0.130	0.190	0.053	0.050	0.151	0.209
Theil	0.044	0.095	0.100	0.261	0.074	0.076	0.139	0.220	0.054	0.050	0.156	0.220
Mean income (yuan)	4,690	5,305	9,226	13,688	3,810	6,372	9,211	14,223	4,280	4,672	7,892	9,210

Note: All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

Source: Author's calculation using CHIP data.

The decomposition by region in Table 4.13 indicates that eastern SEZ/OCs had higher mean incomes than Non-SEZ/OCs for every sample year. From 1998 to 2002, SEZ/OCs increased incomes by 407 percent, while Non-SEZ/OCs had a 316 percent increase. Moreover, in 2007, eastern SEZ/OCs had lower income inequality indices than eastern Non-SEZ/OCs. The change in inequality from 1988 to 2007 for the Gini, MLD, and Theil indices was 31 percent, 72 percent, and 40 percent respectively in SEZ/OCs, and 86 percent, 263 percent, and 273 percent in Non-SEZ/OCs.

In the central region, Transition cities went from having the lowest mean incomes in 1988 to the highest in 2007, overtaking Non-SEZ/OCs in 1995 and SEZ/OCs in the final survey year. From 1988 to 2007, Transition cities had the highest increase in mean incomes (273 percent), followed by SEZ/OCs (192 percent) and Non-SEZ/OCs (115 percent). Furthermore, the income gap between SEZ/OCs and Non-SEZ/OCs increased from being 17 percent higher in 2002 to 49 percent higher in 2007. Similarly, the income gap between Transition cities and Non-SEZ/OCs increased from being 17 percent higher in 2002 to 54 percent higher in 2007.

With regard to income inequality, Transition cities had the highest inequality indices in 1988, but the lowest in 2007. From 1988 to 2007, Transition cities increased their Gini, MLD, and Theil indices by 61 percent, 164 percent, and 197 percent respectively, compared to 123 percent, 412 percent, and 493 percent in SEZ/OCs, and 98 percent, 294 percent, and 307 percent in Non-SEZ/OCs.

4.4 Why is Inequality lower in Cities with Preferential Policies?

In the previous section, the results from the spatial decomposition of income inequality in Urban China using the CHIP samples, reveals that income inequality is lower in cities with preferential policies and autonomy, SEZ/OCs, than the other cities (Non-SEZ/OCs). However, the spatial decomposition of inequality "is not well designed for multivariate analysis that requires holding constant the effects of correlated variables." (Yue, Sicular, Li, & Gustafsson, 2008, p. 101) In order to conduct a multivariate analysis that allows continuous variables, while controlling for the co-variation of the determinants of income, a regression-based decomposition of inequality has been chosen as a method to explain the differences in inequality.

4.4.1 Regression-based Decomposition of Inequality

Following the methodology proposed by Gustafsson and Li (2001), after measuring inequality, one can identify how much of the measured inequality is attributable to certain explanatory characteristics. The method can be explained in three parts as follows:
First, a regression estimation based on the following income equation:

$$y = X\beta + \epsilon \quad \ldots\ldots(4.14)$$

where y is income, X is a matrix of explanatory variables, β is a vector of the regression coefficients for each variable, and ε is the vector of residuals. This first part of the decomposition has a dual purpose: first, it provides insight into explaining the relation between the explanatory values and income levels, and second, it provides a means to calculate income flows that are attributable to each of the explanatory variables. These income flows are calculated by multiplying the estimated coefficients by the value of each explanatory variable, shown in the following equation:

$$\hat{y}_i^m = \hat{\beta}_m x_i^m \quad (4.15)$$

where $\hat{y}_i^m$ is the income flow for the m^th^ variable and the i^th^ individual, $\hat{\beta}_m$ is the estimated regression coefficient for each variable and x_i^m is each individual's value for each variable. The sum of all these income flows is equal, plus the constant and the regression residual, is equal to the individual's total income. The final step of the regression-based decomposition of inequality reveals how much of total inequality is attributable to each income source, in this case, the income flows from explanatory characteristics are treated as "sources" of income. The shares of inequality for each income source is explained as:

$$S^m = \frac{\sum_{i=1}^{n} a_i(y)\hat{\beta}_m x_i^m}{I(y)} \quad (4.16)$$

where S^m is the weighted sum of the estimdated income flows of all individuals divided by overall inequality $I(y)$. The weights $a_i(y)$ depend on the choice of inequality measure, which in this case is the Theil index. As discussed in Chapter 3, the decomposition of different indices provide different qualitative information due to the differing properties of each index, and it was explained that the properties of the Theil index are the most desirable.

Lastly, since the residual from equation 4.14, represents an unexplained component of income, one must also estimate the contribution of this unexplained component to overall inequality. Therefore, the contribution of the estimated residual is explained as:

$$S^\varepsilon = \frac{\sum_{i=1}^{n} a_i(y)e_i}{I(y)} \quad (4.17)$$

where e_i is the estimated residual and S^ε is the share of inequality contributed by the residual.

Regression Analysis

In selecting determinants of income inequality, one must first select those variables which affect income and its distribution, but that do not form part of the income function itself. Yue, Sicular, Li, & Gustafsson (2008) demonstrate the impact of household characteristics on per capita income and income inequality. Huang, et al. (2011) identify that urban housing reforms reduced inequality in urban areas and revealed that female-headed households and membership in the communist party contributed to household wealth. Other reforms such as the DB, minimum income subsidy mentioned before, can also have an impact on inequality. The effect of education on income varies; some studies show that while a college education in itself doesn't have a significant effect on wages, obtaining a degree from a high-ranking university does. (Cucco, Beresford, & Prota, 2012) Conversely, Gustafsson and Li (2001) found that the effect of education on income is higher for the bottom of the income distribution curve.

Table 4.14 shows the summary of the selected household characteristics between SEZ/OCs and Non-SEZ/OCs for each of the sample years. For some of the household characteristics, such as the mean age of working age members, the percentage of working age members, and the percentage of male working age members, there seems to be no difference between city types across sample years. Average education and experience of working age members are slightly higher in SEZ/OCs than Non-SEZ/OCs. Percentage of working age members in poor health seems to have decreased dramatically from 14% in 1988 to less than 2% in 2002. With regard to ethnic minorities, there are more in Non-SEZ/OCs than SEC/OCs in all the sample years, with the gap increasing slightly, by two percentage points between 1988 and 2002.

Table 4.14: Summary of selected explanatory variables (mean values)

Variable	1988		1995		2002		2013	
	SEZ/OCs	Non-SEZ/OCs	SEZ/OCs	Non-SEZ/OCs	SEZ/OCs	Non-SEZ/OCs	SEZ/OCs	Non-SEZ/OCs
Household								
Mean age of working age members (WAM)	35.00	35.05	35.65	35.87	39.25	38.73	39.39	39.33
Percentage of WAMs	0.69	0.70	0.70	0.70	0.74	0.73	0.69	0.68
WAM Males (%)	0.34	0.34	0.34	0.34	0.36	0.36	0.33	0.34
Avg. Education WAM	4.65	4.86	10.50	10.17	11.26	10.79	11.51	11.35
Avg. Experience WAM			12.37	12.31	20.21	19.88	18.84	18.98
WAM Poor Health (%)	0.14	0.14	0.20	0.18	0.01	0.02	0.01	0.01
Ethnic Minority (%)	0.01	0.03	0.02	0.05	0.02	0.06	0.03	0.07
Size	3.73	3.85	3.31	3.37	3.20	3.24	3.32	3.43
Female Headed	0.07	0.08	0.32	0.34	0.38	0.29	0.30	0.22
Party Member Headed	0.36	0.39	0.36	0.34	0.35	0.38	-	-
Temp Workers			0.08	0.05	0.30	0.22	0.43	0.38
Tertiary Education			0.24	0.28	0.49	0.47	0.29	0.29
Reform								
Housing Subsidy	0.00	0.01	0.47	0.37	0.09	0.08	0.67	0.67
Public Housing	0.89	0.91	0.70	0.51	0.20	0.16	-	-
Di Bao (Min Inc)	-	-		-	0.02	0.02	0.05	0.07
Labor Mobility D.			0.47	0.56	0.87	0.87	0.84	0.84
Observations	4,802	26,917	6,137	15,561	6,514	13,735	6,702	13,185

Note: Mean percentages shown as decimals. Dummy variables also represented in this way.

Source: Created by Author using CHIP data.

Household size is slightly larger in Non-SEZ/OCs, while the percentage of female-headed households were higher in 1988 and 1995 in Non-SEZ/OCs, but this has reversed in the 2002 sample, where SEZ/OCs have 38% of households headed by females compared to only 29% in Non-SEZ/OCs. The percentage of household heads with membership to the communist party is higher in Non-SEZ/OCs for the years 2002 and 1988, although the inverse relation was true for the 1995 sample. The percentage of temporary workers, which is an indicator of more liberalized labor markets since, in the pre-reform era, all employment was life-time, is higher

in SEZ/OCs. The percentage of individuals with higher education is also higher in SEZ/OCs. With regard to subsidies, more households receive housing subsidies and more households live in public housing, in SEZ/OCs, from 1995 onwards. Only 2% of households receive minimum income subsidies (Di Bao) in both city types for 2002. A labor mobility dummy indicating change of workplace, designates that up to 87% of households have a member who has changed workplace in the last seven years, in both types of cities.

Additional dummies were created to control for industry, occupation and enterprise ownership; these dummies use the questionnaire codes used in the CHIP survey. Reference dummies for industry, occupation, and enterprise are agriculture, farmer and state-share holding enterprises, respectively. Furthermore, Urban Size dummies were created to control for the variances in inequality due to the population size of each city. From the sample, cities with smaller populations have the lowest inequality measures, therefore, the cities were categorized into quintiles, and the reference dummy is the third quintile. Other location dummies are used such as region and province, for which East and Beijing are the references, respectively.

Table 4.15 and Table 4.16 contain the results from the linear equation estimated using ordinary least squares (OLS).[68] The first two models (columns) give estimates for 1988, the second two for 1995, the third two for 2002, and the last two columns for 2013. For each year, results are given for cities with preferential policies, SEZs and OCs: labeled "SEZ", and other cities: labeled "NON". The regression results show that the household variables are highly influential on per capita income, although the magnitude of the coefficients vary between city types and sample years. The mean age of working age members, for example, is highly significant for both SEZ/OCs and Non-SEZ/OCs, but the coefficient shown for Model 5 is considerably higher than that of Model 6, indicating that having older working age members is

[68] Earnings equations are usually specified in semi-log form, but regression-based decomposition requires that the dependent variable isn't transformed. "If the decomposition were carried out using results from a semi-log specification, they could only be used to analyze inequality in log income, but we are interested in inequality of income, not of log income or some other transformation of income." (Yue, et al., 2008, p. 97)

correlated with higher incomes, but the increase in income is more likely to be higher in SEZ/OCs than Non-SEZ/OCs. The percentage of working age members that are males, however, are only significant for Non-SEZ/OCs with a positive correlation with income, indicating that in Non-SEZ/OCs households with more working age males are very likely to have higher incomes. Conversely, female headed households is only highly significant for SEZ/OCs, indicating that especially in the 2002 sample, households are very likely to have higher incomes if the head of household is female in SEZ/OCs.

The average education of working age members is positively correlated for both models in 2002, with a higher magnitude of coefficients for SEZ/OCs, indicating that the returns to education are higher in cities with preferential policies. This correlation is in sharp contrast to 1988, where the returns to education are negative. Furthermore, there are two sets of tertiary education dummies. The first specifies number of members with tertiary education, the reference, being one or less, and indicates that in 2002, having two or more members with tertiary education in the household, increases the likelihood that incomes will be much higher in SEZ/OCs, though having more than four is no longer significant. For the Non-SEZ/OCs, however, regardless of how many members a household has, there is a positive significance, although the magnitudes of coefficients are much lower. Again, the returns to tertiary education in 1988 are negative for both city types. The second tertiary dummy is for university rank, one being the highest and four being the lowest. In SEZ/OCs, having a member of the household in one of the highest ranking universities indicates that incomes are highly likely to be considerably higher. In Non-SEZ/OCs having a member of the household in any tertiary institution regardless of rank is significantly correlated with higher earnings.

Table 4.15: Per capita income regression estimates (dependent variable: household disposable income per capita)

Variable	1988 SEZ (1)	1988 NON (2)	1995 SEZ (3)	1995 NON (4)	2002 SEZ (5)	2002 NON (6)	2013 SEZ (7)	2103 NON (8)
Mean age of WAMs	14.00***	15.44***	-26.76	27.02***	132.52***	7.82***	-65.85*	52.06*
Percentage of WAMs	214.94**	455.25***	-367.18	389.06	-273.32	563.03*	-6229.09***	-1211.63
WAM Males (%)	-148.48	-168.98***	-1529.47	-227.70	-389.82	368.27**	6577.41***	4843.25***
Avg. Edu. WAM	-27.76**	-36.86***	4.47	38.60**	293.60***	24.44***	689.77***	408.07***
Avg. Exp. WAM			132.33**	-16.70	1.08	0.77**	-184.37	-630.11***
$Exp.^2$			-0.66	2.63***	0.00***	0.00***	5.49***	12.03***
WAM Poor Health (%)	-59.30	53.32**	-612.16	1333.58***	1440.77*	589.72**	-19056.50***	-11555.00
Ethnic Minority (%)	97.75	11.57	-1397.46	-84.93	1675.99***	229.47***	4345.27***	642.69
Size	-109.51***	-70.95***	-1156.86***	-527.86***	-1245.41***	72.02***	-4976.43***	-3631.88***
Female Headed	183.81***	2.02	-293.29	87.47	323.22***	99.46	-180.92	1501.20***
Party Member Headed	114.46***	27.88***	443.36	-152.29*	998.92***	98.39***		
Temp Workers			-925.89**	-318.88*	-976.18***	121.88***	-4597.90***	-5818.61***
Tertiary Ed. 2 Members	-245.01***	-184.98***	527.44*	247.43***	515.70***	118.74***	2521.20***	3078.72***
3 Members	-462.73***	-274.69***	5590.42***	-335.70	2236.79***	171.23***	8024.19***	4244.95***
4 Members	-528.36***	-392.01***	557.74	-421.27	2537.10***	312.76***	12606.84***	8139.05***
5 Members	-965.47***	-291.50***	0.00	-780.79	773.64	696.27**	20626.09***	-11566.06
University Rank1					2704.90***	331.01***	-203.54	8236.85***
University Rank2					150.20	223.63***	1449.85	4290.14***
University Rank4					79.04	348.67***	621.77	-1418.08
Welfare Subsidy	72.06	149.95***						
Ration Coupons	-90.16***	91.50***						
Housing Subsidy	-289.72	-35.97	1674.26***	1068.09***	842.74***	223.34***	-252.52	-37.13
Public Housing	-155.81***	-21.82	-2725.41***	-1764.03***	-2637.59***	171.36***		
Di Bao (Min Inc)					-754.14*	297.97	-3720.76***	-3556.81***
Adjusted R Squared	0.2894	0.2232	0.1301	0.2715	0.5236	0.4999	0.3244	0.2712
Observations	4,657	26,297	5,742	14,928	6,485	12,925	6,702	13,185

*Note: ***, **,* indicate significance at 1%, 5%, and 10% confidence levels, respectively.*

Table 4.16: (Continued) Per capita income regression estimates (dependent variable: household disposable income per capita)

Variable	1988 SEZ (1)	1988 NON (2)	1995 SEZ (3)	1995 NON (4)	2002 SEZ (5)	2002 NON (6)	2013 SEZ (9)	2013 NON (10)
Manufacturing	-80.16***	8.25	717.94**	-22.09	-839.34***	152.87***	-2545.48***	1217.67*
Construction	8.10	-53.69***	-204.39	125.20	-1022.21***	227.26	-229.40	3826.27***
Geology	-60.93	-10.28	5012.44***	292.99	3522.62***	399.43**	-1706.90	-2430.39*
Transportation	-11.07	-21.56	229.64	921.47***	511.71**	171.58	313.20	1063.13
Retail	67.39**	21.14*	354.93	80.14	-383.25*	167.65***	1599.04**	-140.47
Finance	-15.06	8.58	1682.89**	3028.23***	2153.63***	222.72***	3348.26***	2552.15**
Real estate	-198.37***	-35.05	463.25	142.86	60.83	349.50	-855.38	2779.22**
Health	7.29	-36.45**	248.35	-95.61	1459.87***	199.30**	462.70	2218.30**
Education	-15.90	-38.85***	1501.44***	265.44**	145.94	180.85**	-102.60	-484.12
Science	-177.69***	29.26	1477.09***	515.74**	337.93	309.75	1873.86	1634.25
Government	-108.89***	-28.68**	208.23	556.89***	292.31	201.11	-1273.51	2086.78***
SOE	-20.96	57.99***	992.56**	437.61***	273.35	138.21	216.81	66.71
Urban Collective	-44.38*	-47.84***	-397.50	84.89	-334.04	170.09***	647.82	-2362.55***
Private Firm	308.60***	271.29***	-292.09	-1082.95**	804.69***	208.17	-106.07	615.74
Sino-foreign	142.38**	-226.63	19.21	709.99***	563.65*	312.33***		
Foreign	153.76	-	2612.71	1974.72**	409.63	472.43***	3497.26***	3277.40***
Self-employed	497.70***	-27.96	-3578.49*	120.95	1235.50***	238.54***	1420.02**	3829.42***
Professional	39.54	36.88***	937.91***	459.54***	872.72***	145.21***	2944.04***	4673.40***
Gov. Director	-39.31	-11.04	3690.26***	1105.36***	200.31	231.79***	2248.02	5351.12***
Gov. Inst. Director	224.51***	20.24	-14.58	1051.62***	755.87***	164.43***	-1539.12	785.08
Unskilled	-56.69*	-25.88**	-345.33	-201.15**	-1021.21***	161.06		
Urban Size 1	-414.46***	-51.60***	0.00	-894.80***	-7532.56***	142.31***	8960.40***	-2229.97***
Urban Size 2	-238.94***	-7.35	2682.95***	100.22	-2081.40***	168.13**	7363.70***	-923.57*
Urban Size 4	118.98**	1.87	3789.53***	853.10***	722.30**	160.59***	15433.70***	6564.12***
Urban Size 5	0.00	84.00***	576.73	-243.74	730.53	286.75***	3836.40***	11827.37***
Adjusted R Squared	0.2894	0.2232	0.1301	0.2715	0.5236	0.4999	0.3244	0.2712
Observations	4,657	26,297	5,742	14,928	6,485	12,925	6,702	13,185

*Note: ***, **,* indicate significance at 1%, 5%, and 10% confidence levels, respectively.*

The percentage of working age members in poor health seems to be correlated with higher incomes, as well. This might be a reflection of health subsidies. Additionally, ethnic minorities have a highly significant, positive correlation with income, especially in SEZ/OCs.[69] Household size, while highly significant for both city types, is negatively correlated with income in SEZ/OCs and positively correlated with income in Non-SEZ/OCs for 2002. This might be linked to the higher dependent ratio for non-income generating members like children. The implication is that in SEZ/OCs the larger the household size, the lesser the income, while the opposite is true of Non-SEZ/OCs. This can be logically explained if there are more dependents in a household that can produce less income, or none at all, then they become a burden on household income, as is the case in SEZ/OCs. Otherwise, if the larger households have more working members, then the larger the household, the more income it generates, as is the case with Non-SEZ/OCs. Moreover, if the head of the household is a member of the Communist Party, incomes are very likely to be higher, with the magnitude of the coefficient being considerably higher in SEZ/OCs than other cities for 2002.

With regard to the estimates concerning subsidies, welfare and ration coupon subsidies, which were only available for the 1988 sample, show that they are only positively correlated for Non-SEZ/OCs, while the latter shows a negative relation with income for the SEZ/OCs sample. With regard to housing subsidies, there is a positive correlation, which is highly significant for both types of cities from the 1995 sample onwards. The magnitude of the coefficient is higher for SEZ/OCs, indicating that the households receiving these subsidies are very likely to have higher incomes. The opposite is true, however, of households living in public housing, which show a negative correlation with income for all years in SEZ/OCs, and for 1988 and 1995 in Non-SEZ/OCs. For 2002, public housing and income in Non-SEZ/OCs exhibit a

[69] This might be a reflection of policies by the PRC to increase the social and economic wellbeing of ethnic minorities. (Information Office of the State Council, 2009)

highly significant, positive relation. Perhaps, a reflection on the market inflated prices in these cities.

Table 4.16 shows the regression estimates resulting from the industry, occupation, enterprise and urban size dummy variables. Noteworthy results include the negative relation between manufacturing industry and income in SEZ/OCs for 2002, in contrast to the positive relation in Non-SEZ/OCs. Because of the trade incentives offered in cities with preferential policies, many manufacturing job opportunities are offered here, but being employed in this industry comes with low wages and therefore a high likelihood of lower incomes. In Non-SEZ/OCs, the inverse relation is evident, indicating that employment in manufacturing industry will reflect higher incomes. This relationship persisted in 2013, whereby manufacturing was negatively and significantly correlated with income in SEZ/OCs but positively correlated in Non-SEZ/OCs. This relationship remains troubling and is probably indicative of the large investment projects brought on by the 2009 fiscal stimulus. This argument is supported by the positive and highly significant correlation between construction and income in Non-SEZ/OCs for 2013, compared to a non-significant positive relationship for SEZ/OCs. Furthermore, Finance is becoming more relevant; in 1988, it was not significant, but in 2002, it is highly significant and with a very large coefficient in SEZ/OCs. On the other hand, SOEs are becoming less relevant, showing no significance in 2002, while private firms and foreign firms are highly significant. Occupational and urban size dummies are highly significant in influencing income. For the 2002 sample, it is important to highlight that the smaller cities had lower incomes for the SEZ/OCs only, while, for the Non-SEZ/OCs, urban size seems to only increase income, whether it is small or large.

Finally, the R Squared values for each of the models shown, is a measure of how much of the total variation is explained by the explanatory variables used in the models. While it can be seen that, for the 2002 sample, the variables used account for 52% and 50% of the total variation for SEZ/OCs and Non-SEZ/OCs, respectively, for the previous samples the R Squared

values are much lower. Therefore, it can be concluded that the variables used in this income equation are better suited for explaining income variances for the 2002 sample than for previous samples. Additionally, it can be inferred that the importance of the explanatory variables in explaining variances of income has increased over time.

Analysis of Income Flows

Using the coefficients from the previous regression, the average income flows derived from selected explanatory variables in the regression equation are shown in Table 4.17. These average income flows provide information on which variables are relatively important with relation to mean income. Variables that positive income flows, increase income, while those that have negative income flows decrease income. Focusing first on the 2002 sample, one can see that the income flows from the mean age of working age members while those for household size and percentage of working age members are negative. The income flows from education are relatively large, contributing to 32% of mean income in SEZ/OCs and 21% in Non-SEZ/OCs. Inverse relations are also apparent, such as the percentage of working age males is negative for SEZ/OCs while positive for Non-SEZ/OCs. Health, ethnic minority, party membership and female head of household seem relatively inconsequential as sources of income. Income flows from health and ethnic minority are less than or equal to 1%, the latter being only 0.2% of mean income in SEZ/OCs. Female headed households and party membership contribute 1.2% and 3.3 % of mean income in SEZ/OCs, respectively, compared to 0% and 2.4% in Non-SEZ/OCs, respectively.

With regard to income flows from subsidies, housing subsidies and Di Bao have very small shares of mean income, while residing in public housing has a negative income flow of -5.2% of mean income in both city types. Labor mobility has a negative income flow in SEZ/OCs contributing to 6.1% of mean income, while having a positive income flow in Non-SEZ/OCs and a smaller 3.1% share of mean income. Manufacturing and finance have relatively small

shares of mean income, the former having negative income flows and the latter positive, contributing less than 3% and 0.5% to mean income, respectively. Similarly, working for SOEs and Private have small shares, although positive income flows in SEZ/OCs and negative in Non-SEZ/OCs.

Table 4.17: Average income flows from selected explanatory variables (share of mean income)

Variable	1988 SEZ (1)	1988 NON (2)	1995 SEZ (3)	1995 NON (4)	2002 SEZ (5)	2002 NON (6)	2103 SEZ (9)	2013 NON (10)
Mean age of WAM	505 (25.9)	554 (34.1)	-1020 (-15.9)	1010 (18.7)	5200 (50.3)	4202 (43.5)	-2350 (-8.4)	1842 (7.5)
Percentage of WAMs	152 (7.8)	325 (20)	-274 (-4.3)	286 (5.3)	-214 (-2.1)	-770 (-8.0)	-4275 (-15.2)	-827 (-3.4)
WAM Males (%)	-52 (-2.7)	-59 (-3.6)	-557 (-8.7)	-82 (-1.5)	-149 (-1.4)	304 (3.1)	2194 (7.8)	1628 (6.7)
Avg. Education WAM	-129 (-6.6)	-179 (-11)	47 (0.7)	393 (7.3)	3306 (32.0)	2021 (20.9)	7189 (25.6)	4164 (17.0)
Avg. Experience WAM			1749 (27.3)	-214 (-4)	1073 (10.4)	-1583 (-16.4)	-3473 (-12.4)	-11956 (-48.9)
WAM Poor Health (%)	-9 (-0.5)	8 (0.5)	-130 (-2)	249 (4.6)	22 (0.2)	-22 (-0.2)	-154 (-0.5)	-124 (-0.5)
Ethnic Minority (%)	1 (0.1)	0 (0)	-34 (-0.5)	-5 (-0.1)	30 (0.3)	94 (1.0)	121 (0.4)	42 (0.2)
Size	-414 (-21.2)	-276 (-17)	-3912 (-61)	-1804 (-33.3)	-4057 (-39.2)	-4264 (-44.1)	-16518 (-58.8)	-12448 (-50.9)
Female Headed	12 (0.6)	0 (0)	-95 (-1.5)	30 (0.6)	125 (1.2)	2 (0)	-54 (-0.2)	335 (1.4)
Party Member Headed	42 (2.2)	11 (0.7)	156 (2.4)	-51 (-0.9)	338 (3.3)	232 (2.4)		
Temp Workers			-76 (-1.2)	-15 (-0.3)	-305 (-2.9)	-189 (-2.0)	-1966 (-7.0)	-2215 (-9.1)
Tertiary Ed.	-304 (-15.6)	-199 (-12.2)	207 (3.2)	48 (0.9)	627 (6.1)	382 (4.0)	1305 (4.6)	1080 (4.4)
University Rank					79 (0.8)	81 (0.8)	455 (1.6)	372 (1.5)
Welfare Subsidy	3 (0.2)	14 (0.9)						
Ration Coupons	-71 (-3.6)	78 (4.8)						
Housing Subsidy	-1 (-0.1)	0 (0)	792 (12.3)	388 (7.2)	77 (0.7)	87 (0.9)	-170 (-0.6)	-25 (-0.1)
Public Housing	-139 (-7.1)	-20 (-1.2)	-1885 (-29.4)	-886 (-16.4)	-542 (-5.2)	-501 (-5.2)		
Di Bao (Min Inc)					-17 (-0.2)	-8 (-0.1)	-191 (-0.7)	-250 (-1.0)
Labor Mobility			-471 (-7.3)	93 (1.7)	-633 (-6.1)	304 (3.1)	771 (2.7)	-243 (-1.0)
Manufacturing	-47 (-2.4)	5 (0.3)	401 (6.3)	-12 (-0.2)	-276 (-2.7)	-185 (-1.9)	-447 (-1.6)	237 (1.0)
Finance			47 (0.7)	107 (2)	50 (0.5)	45 (0.5)	175 (0.6)	100 (0.4)
SOE	-19 (-1)	52 (3.2)	919 (14.3)	395 (7.3)	110 (1.1)	-57 (-0.6)	45 (0.2)	14 (0.1)
Private	-5 (-0.3)	-9 (-0.6)	-69 (-1.1)	11 (0.2)	0 (0)	-33 (-0.3)	-35 (-0.1)	179 (0.7)
Urban Size 1	-48 (-2.5)	-11 (-0.7)	0 (0)	-238 (-4.4)	-195 (-1.9)	-236 (-2.4)	880 (3.1)	-586 (-2.4)
Urban Size 2	-60 (-3.1)	-1 (-0.1)	502 (7.8)	21 (0.4)	-225 (-2.2)	84 (0.9)	658 (2.3)	-228 (-0.9)
Urban Size 4	20 (1)	0 (0)	1519 (23.7)	83 (1.5)	243 (2.3)	194 (2)	6084 (21.7)	847 (3.5)
Urban Size 5	0 (0)	14 (0.9)	147 (2.3)	-39 (-0.7)	296 (2.9)	154 (1.6)	839 (3.0)	1724 (7.0)
Mean Income	1,953 (100)	1,627 (100)	6,415 (100)	5,411 (100)	10,341 (100)	9,658 (100)	28,073 (100)	24,468 (100)

The income shares from the different explanatory variables change over time, reflected in the differences between the 1988, 1995 and 2002 samples. The relative importance of education and party membership have increased, while the contribution to average income from Housing Subsidies, percentage of working age members, and working in SOEs has declined. Generally, though, the variables that have relatively large income shares have remained important throughout the sample years such as mean age and household size, while most of the characteristics that were relatively unimportant have remained so, as well.

Contributions to Inequality

The results from the regression-based decomposition of inequality appear in Table 4.18. The figures in this table represent the contribution of the explanatory variables and the residual to overall inequality, which is represented by the Theil index shown at the bottom of the table. The residual represents the contribution to inequality from other factors other than the explanatory variables. The contribution of the residual to the 2002 sample is substantially lower than in previous years, indicating that the explanatory variables have increased in importance and contribution to inequality. Furthermore, the contributions of dummy variables have been aggregated and are labeled as “total”. From the table, it is clear that most of the variables have a positive contribution to inequality and only a few, percentage of working age members and the percentage that are male, reduce it, but only at a very small share.

From the 2002 sample, it is evident that the largest contributor to inequality is location, contributing 21.68% and 26.57% of overall inequality in SEZ/OCs and Non-SEZ/OCs, respectively. The second highest contributor to inequality is tertiary education, contributing 10.63% and 7.91% of overall inequality in SEZ/OCs and Non-SEZ/OCs, respectively. Both of these two highest contributors have increased their share of contribution to inequality over time. Other household characteristics, such as health, ethnic minority, party membership and female head of household, tend to increase inequality, but not by much.

Table 4.18: The contributions (%) of explanatory variables to inequality

Household Disposable Income Per Capita	**1988 SEZ (1)**	**1988 NON (2)**	**1995 SEZ (3)**	**1995 NON (4)**	**2002 SEZ (5)**	**2002 NON (6)**	**2013 SEZ (7)**	**2013 NON (8)**
Mean age WAMs	4.37	10.11	-0.61	1.84	3.11	3.87	0.31	0.24
Percentage of WAMs	0.68	6.01	0.00	0.65	-0.26	-0.88	-1.61	-0.30
WAM Males (%)	0.27	-0.85	0.40	-0.20	-0.19	0.40	1.67	0.82
Avg. Education WAM	1.60	2.76	0.07	0.85	5.70	4.51	9.70	5.27
Avg. Experience WAM	0.00	0.00	2.76	6.04	10.36	6.30	-0.54	-5.00
WAM Poor Health (%)	0.21	0.45	-0.27	3.31	0.03	0.07	1.60	0.78
Ethnic Minority (%)	0.03	0.00	0.20	0.03	0.14	0.20	-0.54	-0.10
Size	8.38	8.56	4.58	3.17	5.82	6.61	25.29	20.29
Female Headed	1.57	0.00	0.20	0.03	0.50	0.00	-0.03	1.07
Party Member Headed	1.51	0.37	1.21	-0.31	2.65	1.31	0.00	0.00
Tertiary, total.	27.98	22.48	9.23	5.93	18.26	14.44	17.18	12.28
Reforms and Subsidies, total	3.74	1.87	8.62	2.83	3.62	2.83	1.16	2.42
Industry, total	3.95	0.00	6.80	6.82	5.31	2.32	6.67	2.79
Occupation, total	7.43	6.29	22.02	9.24	5.69	5.80	9.13	17.58
Enterprise, total	3.21	3.53	2.22	1.53	2.03	3.72	-0.36	0.23
Location, total	35.08	38.43	42.56	58.22	37.24	48.49	30.36	41.62
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes: 1. Values represent relative contribution among independent variables. 2. Contribution of location is for all provinces using a baseline of Beijing from 1988-2002 and Anhui for 2007.

Source: Created by Author using CHIP data.

Variables relating to reforms and subsidies increase overall inequality, with the contribution of 2.11% in SEZ/OCs, which is slightly higher than 1.55% in Non-SEZ/OCs. Similarly, Industry has a slightly higher contribution to inequality, at 3.09% in SEZ/OCs and 1.27% in Non-SEZ/OCs; while Occupation contributes 3.31% and 3.18% in SEZ/OCs and Non-SEZ/OCs, respectively. All of these variables seem to increase in importance and contribution over time.

4.5 Review of Findings

The categorization of cities in the urban samples of the CHIP surveys into cities with citywide preferential policies, SEZ/OCs, and cities without them, Non-SEZ/OCs, reveals that mean incomes are indeed higher in the former. The results from the spatial decomposition of inequality reveal that the inequality is lower in cities with preferential policies compared to other cities. When further decomposed by region, the same is true for the East and Center, but not for the West. The cities in the western region have had preferential policy status for the least amount of time, and as mentioned in Chapter 3, this region is the least developed and suffers the most disparities due to CAD development strategies. When analyzing the trend from 1995 to 2002, however, inequality in western SEZ/OCs has decreased substantially, while increasing in Non-SEZ/OCs. This indicates that, after 1995, there has been a rapid convergence in inequality, and if the trend continues, then SEZ/OCs will have lower inequality, making this result consistent across regions.

The results from the regression-based decomposition of inequality show that location remains the largest determinant of inequality in both types of cities; however, the contribution to inequality is lower in SEZ/OCs. This is probably due to the fact that SEZ/OCs were selected to have preferential status because they shared common features and have similar economic development, while Non-SEZ/OCs are more diverse.

Tertiary education is the second largest contributor to inequality. The returns to education are higher in SEZ/OCs than in other cities, which reveals that the more members with tertiary education each household has then, the higher income will be, which is also reflected in a higher contribution to inequality in SEZ/OCs over Non-SEZ.OCs.

Furthermore, subsidies for health, housing, and minorities seem to be more significant in SEZ/OCs than in Non-SEZ/OCs. This implies that the welfare system is better or more efficient in providing for the poorest in the cities with preferential policies than in other the

cities. Moreover, there are more temporary workers and more people benefitting from housing subsidies and living in public housing in SEZ/OCs than in Non-SEZ/OCs, but the income distribution by deciles, show that the lowest deciles, or the poorest households, receive a higher share of the income distribution in SEZ/OCs than in Non-SEZ/OCs. Additionally, the percentage of male workers in a household is not related to higher incomes in SEZ/OCs, while having a female head of household is highly significant. The opposite is true in Non-SEZ/OCs. This indicates that households in SEZ/OCs are less dependent on male workers to earn income, and those with female heads of households are very likely to have much higher incomes.

With regard to industry and occupation, manufacturing has a negative correlation with income in SEZ/OCs while having a positive relation in Non-SEZ/OCs. A similar relationship is evident for construction. Furthermore, finance is becoming more relevant as an industry that conduces to higher incomes. Also, apparent in the results, are the move from SOEs, which are no longer relevant, towards private firms, reflected with a higher correlation to incomes in SEZ/OCs.

The results contained in this chapter provide meaningful answers to the research question and objectives in uncovering and explaining the effects of preferential policies on income inequality. The subsequent, and final, chapter, bridges these findings with earlier chapters, highlighting the contribution of the results to literature in the field, and drawing policy implications and areas for further research that arise from the major findings.

Inequality gaps are also portrayed when decomposing by socio-economic status indicators, including gender, hukou, age, and education. The results indicate that throughout many of the different socio-economic stratifications, those residing in SEZs and OCs have higher incomes and lower inequality measures than the residents of cities without preferential policies.

The preceding analyses provide a few meaningful insights into the differences in income inequality between cities with and without preferential policies. Previous work using the CHIP surveys by Gustafsson, Li, Sicular & Yue (2008) revealed that urban inequality had decreased from 1995 to 2002. However, the first decomposition into two subgroups of the Entire Urban Sample reveals that income inequality had only decreased in cities with preferential policies, while continuing to increase in cities without preferential policies. The decomposition of Panel A further reveals that the decrease in income inequality was driven by Transition Cities.

There are a few differences between Panels A and B. The decrease in income inequality from 1995 to 2002 for Transition cities is only evident in Panel A. Additionally, the income gap between Transition cities and cities without preferential policies is converging in Panel A, while diverging in Panel B. However, both Panels A and B reveal that Transition cities improved their distribution of income compared to other cities. While other cities witnessed a decrease in the share of total income of the poorest 40 percent of households and an increase in the share of the richest 10 percent, Transition cities were the only group that showed the reverse. Furthermore, Transition cities had the smallest increase in income inequality indices compared to other cities in both Panels A and B. Finally, Transition cities outperformed other cities with regard to income growth within each region.[70]

[70] Central and western regions only since there were no Transition cities in the eastern region.

Chapter 5: A Regional Perspective on Development Zone Strategies and Income Inequality in Urban China

5.1 Introduction

The previous chapter revealed that cities with preferential policies exhibited higher income growth and lower income inequality. Additionally, location was the main contributor to inequality. However, the subgroup decompositions by region were consistent, and thus not helpful in explaining how location, from the preferential policies perspective, could lead to differences in income and income inequality. Given that cities with preferential policies have implemented different development zones (DZs), the effects of these strategies on inequality are further explored in this chapter. This chapter focuses on the two most productive DZs, the Economic and Technological Development Zone (ETDZ) and the High-Tech Industrial Development Zone (HIDZ), and will measure differences in income inequality at the city level in Urban China by using spatial (subgroup) decomposition analyses.

Fu and Gao (2007) demonstrate the importance of ETDZs and HIDZs to the Chinese economy. First they establish that there is a conflict in typologies used by the body of literature and that in China the term "SEZ" only applied to citywide preferential policies and were not comparable to SEZs and EPZs around the world. The smaller development zones in China, however, do fit the definitions of SEZs and EPZs provided by the World Bank and the ILO. They highlight that even though the combined area of all ETDZs is 0.006% of China, they "contributed 3.8 percent of China's GDP, 8 percent of China's Gross Industrial Output (GIO) and 7 per cent of Industrial Value Added (IVA) in 2005." (Fu & Gao, Export Processing Zones in China: A Survey, 2007, p. 20) Furthermore, the contribution of HIDZs is even bigger, with 0.01% of China's total area, their share of GIO and IVA was 11.7% and 9.4%, respectively, for the same year. Both ETDZs and HIDZs are very important sources of China's FDI stock, contributing about one third of total FDI. Fu and Gao also emphasize that these zones have

higher wages and more non-formal employment than outside the zones. The HIDZs also play very important role in the employment of skilled labor and the number of either national or provincial Development Zones has a strong correlation with the number of newly enrolled students of vocational schools. At the end of 2000, there were 0.56 million scientists and technicians among the 2.51 million employees working at HIDZs, which was 22.3 per cent of the total work force. (Fu & Gao, Export Processing Zones in China: A Survey, 2007, p. 35)[71] This chapter examines differences in income inequality between cities with and without ETDZs and HIDZs in order to identify region-specific implications from the diverse Development Zone Strategies.

While both ETDZs and HIDZs are DZs located within cities, there are some differences between these two types of DZs. ETDZs are focused on technologically advanced projects including industrial production and scientific research while HIDZs were set up with the aim of promoting the commercialization of high-tech achievements, the industrialization of high-tech products and the internationalization of high-tech industries. (Qian, 2008)

As described in Chapter 2 (refer to Tables 2.2 and 2.3), a large majority of ETDZs are involved in developing electronic products and the fine processing of foods while a large majority of HIDZs are dedicated to software and information technology. More than double the number of HIDZs are dedicated to energy saving technologies, environmental protection, and new power generation than ETDZs. Similarly, only HIDZs are focused on Spaceflight and Defense Technology. However, these DZs are competing in some industries. 64% and 68% of ETDZs and HIDZs, respectively, are developing bio-engineered medical and pharmaceutical products. Similarly, 48% of ETDZs and 56% of HIDZs are developing new materials.

[71] Although there are other types of Development Zones in China, such as Free Trade Zones, Export Processing Zones, Bonded Zones, Boarder Cooperation Development Zones, their combined contribution to the Chinese economy is minor in comparison to ETDZs and HIDZs.

There is no previous literature exploring income inequality between cities with and without ETDZs and HIDZs. This chapter uncovers differences between the different DZ strategies with an emphasis on regional differences in an effort to also contribute to the findings of the previous chapter, regarding "location."

5.2 Data and Methodology

This chapter further extends the analyses in the previous chapter using the urban datasets from the China Household Income Project (CHIP) surveys for 1995 (Riskin, Zhao, & Li, 1995), 2002 (Li S. , Chinese Household Income Project, 2002., 2002)[72] and 2013. Out of the 69 cities included in the 1995 survey, 16 of them have ETDZs, as shown in Table 5.1. These are Beijing, Chengdu, Chongqing Wanxian, Dalian, Guangzhou, Hefei, Kunming, Lanzhou, Nanjing, Nantong, Shenyang, Taiyuan, Wuhan, Wuhu, Zhanjiang, and Zhengzhou. The cities with ETDZ constitute 41.9% of the sample, while the remaining 58.1% reside in cities that do not have an ETDZ. For the 2002 sample, Wanzhou district is added to the sample, increasing the number of cities with ETDZ to 17. The share of people living in a city with ETDZ increased to 45% while the percentage of people in cities without an ETDZ decreased to 55% in 2002. The 2013 sample is roughly similar to 2002, where 44% of the sample were residing in a city with an ETDZ while 56% lived in cities without ETDZs.

[72] The 1988 and 2007 surveys were omitted due to the low number of zones in the former and unavailability of data for the latter.

Table 5.1: ETDZs in CHIP surveys (1995, 2002 and 2013)

Types of City	Number of Cities	Observations	Percent
1995			
With ETDZ	16	9,087	41.9
Without ETDZ	53	12,611	58.1
Total	69	21,698	100.0
2002			
With ETDZ	17	9,268	45.0
Without ETDZ	53	11,341	55.0
Total	70	20,609	100.0
2013			
With ETDZ	21	8,776	44.1
Without ETDZ	104	11,111	55.9
Total	125	19,887	100.0

Source: Compiled by Author using CHIP data.

Table 5.2 shows the composition of the CHIP surveys with regards to HIDZs. For the 1995 sample, 19 cities have an HIDZ, making up 38.4% of the sample. These are Changzhou, Chengdu, Chongqing Wanxian, Dalian, Foshan, Guangzhou, Hefei, Huizhou, Kunming, Lanzhou, Nanjing, Shenyang, Shenzhen, Taiyuan, Wuhan, Wuxi, Xiangfan, Zhanjiang, and Zhengzhou. The remaining 50 cities do not have an HIDZ and make up 61.6% of the urban CHIP sample. For the 2002 sample, Changzhou and Shenzhen were dropped, and Wanzhou District was added, for a total of 18 cities with HIDZ and 52 cities without HIDZ, making up 39.7% and 60.3% of the urban sample, respectively. In 2013, 36.5% of the sample resided in a city with an HIDZ while 63.5% were living in a city without an HIDZ.

Table 5.2: HIDZs in CHIP surveys (1995 and 2002)

Types of City	Number of Cities	Observations	Percent
1995			
With HIDZ	19	8,339	38.4
Without HIDZ	50	13,359	61.6
Total	69	21,698	100.0
2002			
With HIDZ	18	8,182	39.7
Without HIDZ	52	12,427	60.3
Total	70	20,609	100.0
2013			
With HIDZ	25	7,253	36.5
Without HIDZ	100	12,634	63.5
Total	125	19,887	100.0

Source: Compiled by Author using CHIP data.

From the lists of cities with ETDZs and HIDZs, there are some overlaps. Some cities have more than one zone, such as both an ETDZ and HIDZ. Table 5.3 shows that in 1995, 47 cities do not have any zones, nine cities have only one zone, either an ETDZ or an HIDZ, 12 cities have both an ETDZ and an HIDZ, and one city, Guangzhou, has two ETDZs and one HIDZ. While 51.7% of the sample reside in cities without any of the two development zones, 48.3% live in cities that have at least one zone. For the 2002 CHIP sample, the share of people living in cities with an ETDZ or HIDZ increases by one percentage point to 49.3%, while the share of people living in cities without any zone decreased to 50.7%. Out of the cities that have a zone, the number of cities with only one zone, has decreased to seven, the number of cities with both an ETDZ and HIDZ has increased to 13, and Guangzhou remains the only city with three zones. Since there is an overlap, where some cities have both an ETDZ and an HIDZ, a further decomposition was performed to account for this. Table 5.4 shows that for 1995 9.8% of the sample resided in a city with only ETDZs compared to 6.4% living in a city with only HIDZs, while in 2002 the share of the sample living in cities with only ETDZs and only HIDZs was 9.6% and 4.4%, respectively.

Table 5.3:Cities with ETDZs or HIDZs in CHIP surveys (1995, 2002 and 2013)

Types of City	Number of Cities	Observations	Percent
1995			
Without zone	47	11,223	51.7
With 1 zone	9	3,524	16.2
With 2 zones	12	6,327	29.2
With 3 zones	1	624	2.9
Total	69	21,698	100.0
2002			
Without zone	49	10,440	50.7
With 1 zone	7	2,888	14.0
With 2 zones	13	6,669	32.3
With 3 zones	1	612	3.0
Total	70	20,609	100.0
2013			
Without zone	94	9,858	49.6
With 1 zone	16	4,029	20.3
With 2 zones	14	5,506	27.7
With 3 zones	1	494	2.5
Total	125	19,887	100.0

Source: Compiled by Author using CHIP data.

Table 5.4: Cities with ETDZs, HIDZs, or both in CHIP surveys (1995, 2002 and 2013)

Types of City	Number of Cities	Observations	Percent
1995			
Without zone	47	11,223	51.7
ETDZ only	3	2,136	9.8
HIDZ only	6	1,388	6.4
Both Zones	13	6,951	32.1
Total	69	21,698	100.0
2002			
Without zone	49	10,440	50.7
ETDZ only	3	1,987	9.6
HIDZ only	4	901	4.4
Both Zones	14	7,281	35.3
Total	70	20,609	100.0
2013			
Without zone	94	9,858	49.6
ETDZ only	6	2,776	14.0
HIDZ only	10	1,253	6.3
Both Zones	15	6,000	30.2
Total	125	19,887	100.0

Source: Compiled by Author using CHIP data.

From the previous tables, one can ascertain that half the sample live in cities with a zone while the other half live in cities without any zones. Out of the people that live in cities with a zone, more people live in cities that have both an ETDZ and an HIDZ than just one of the variants. Furthermore, more people live in cities that have an ETDZ compared to those that live in a city that has an HIDZ. It is under these perspectives that this paper will measure and analyze income inequality.

5.2.1 Methodology

There are many measures of inequality that can be examined. While individual labor income will reflect the earning disparities among the workforce, household labor income, is adjusted to reflect the different size and composition of working-age families. Stiglitz et al., (2009) indicate that the most comprehensive concept of income is adjusted household

disposable income, which has been adjusted for publicly-provided in-kind transfers, as well as taxes and cash transfers.

This chapter focuses on household income per capita, which is total household income divided by the number of members in each household, and household disposable income per capita, which is computed as follows: Total household disposable income, which is composed of the following elements which are found in the CHIP datasets and are consistent with the definitions of household disposable income used in Gustafsson, et al. (2008) and described in (Riskin, Zhao, & Li, 1995)[73]:

(1) Cash income from working members, including monthly wage income, contract income, bonus and above-quota income, and other incomes and allowances;

(2) Income of the retired members, including retirement pensions, income received from working after retirement, and other income received by retirees such as bonuses, welfare payments and subsidies; (3) Income from private/individual enterprises, which is the gross income of enterprises minus the costs of inputs and wages;

(4) Income from property, including interest from savings accounts, dividends, bond interest, income from house rent and income from leasing out other goods;

(5) Miscellaneous income, including private transfer, alimony and family support, gifts, boarding fees from relatives and friends, and other special income;

(6) Subsidies minus taxes and fees paid to government departments (except housing subsidy and ration coupon subsidy) and income in kind;

(7) Housing subsidies, in kind; and

(8) The rental value of owner-occupied housing.

[73] The definition of income differs from the National Bureau of Statistics definition. The CHIP income includes all types of incomes including in-kind and above-quota bonuses, among others. Further details of how these values are calculated are included in the documentation in Riskin, Zhao and Li (1995).

Total household disposable income is then divided by the number of members in each household, and each member of the household is assigned the average household disposable income as their individual income. Thus, while the household is the income-receiving unit, individuals are the unit of analysis.[74] The aim of this chapter is to identify differences in income inequality between the stated subgroups and serve as the foundation for further research on the matter, which is why inequality of both household income per capita and household disposable income per capita are used.

Spatial Decomposition of Inequality

This chapter measures income inequality for each city and then aggregates them using population shares and inter-regional inequality into the following groups of cities:

Cities with and without ETDZ

Cities with and without HIDZ

Cities with 0, 1, 2, and 3 zones

Cities with No Zones, with ETDZs only, HIDZs only, and both zones.

The spatial decomposition mentioned above follows the methodology described in Gustafsson, Li, Sicular, and Yue (2008). National inequality can be decomposed into many levels, the first of which, is regional, where the population is divided into East, Center, and West. Then it can be decomposed into urban and rural inequality.[75] This chapter decomposes inequality to the city level, which is then aggregated to form the three categories mentioned above.

$$I_{ri}(y) = W_{ri} + B_{ri} = \sum_{e=1}^{2} S_{rie} I_{rie}(y) + B_{ri} \ldots\ldots\ldots\ldots\ldots\ldots \quad (5.1)$$

[74] This is considered the standard practice in the predominant literature on income inequality.
[75] Gustafsson, Li, Sicular, & Yue (2008) also decompose inequality at the provincial level.

In equation 5.1, the subscript r is an index for region (1=West, 2=Center, 3=East), i is an index for rural and urban (1=rural, 2=urban) and e, is an index for city type (1=With ETDZ, 2=Without ETDZ). $I_{r2}(y)$ is urban inequality for each region r, which is composed of W, intra-regional inequality, or within-region inequality, and B, interregional inequality, or between-region inequality. While B is the inequality of the mean incomes between regions, W follows the same logic of disaggregation using population shares. $S_{rie}I_{rie}(y)$ is the population share and inequality index for each city type per region, such as $S_{321}I_{321}(y)$ are the population share and inequality index for cities with ETDZs in the eastern region. Similarly, B_{32} represents the inequality of the mean incomes between cities in the eastern region. This type of disaggregation can be used to derive how much of urban inequality is contributed by the differences between inequalities in these types of cities.

$$I_{ri}(y) = W_{ri} + B_{ri} = \sum_{\mathrm{h}=1}^{2} S_{rih}I_{rih}(y) + B_{ri} \ldots\ldots\ldots\ldots\ldots\ldots \quad (5.2)$$

$$I_{ri}(y) = W_{ri} + B_{ri} = \sum_{\mathrm{z}=1}^{2} S_{riz}I_{riz}(y) + B_{ri} \ldots\ldots\ldots\ldots\ldots\ldots \quad (5.3)$$

$$I_{ri}(y) = W_{ri} + B_{ri} = \sum_{\mathrm{d}=1}^{2} S_{rid}I_{rid}(y) + B_{ri} \ldots\ldots\ldots\ldots\ldots\ldots \quad (5.4)$$

Equation 5.2, 5.3 and 5.4 are similar to 5.1, but instead of aggregating into cities with ETDZ, equation 5.2 uses the index h to represent cities (1=With HIDZ, 2=Without HIDZ), equation 5.3 uses the index z to represent cities by number of zones, and equation 5.4 uses the index z to represent cities by type of zone (0=No zone, 1=ETDZ only, 2=HIDZ only, 3=both ETDZ and HIDZ).

For the inequality computations, this paper uses the Gini coefficient, the MLD and Theil indices. This is for consistency purposes that allow comparison with the most recognized research.

5.3 Income Inequality by Development Zone

5.3.1 Income Inequality in Economic and Technological Development Zones

Table 5.5: Income inequality between cities with and without ETDZs

	1995		2002		2013	
	Cities without ETDZs	Cities with ETDZs	Cities without ETDZs	Cities with ETDZs	Cities without ETDZs	Cities with ETDZs
	Disposable household income per capita					
Gini	0.323	0.319	0.318	0.319	0.337	0.313
MLD	0.179	0.177	0.175	0.169	0.200	0.170
Theil	0.226	0.233	0.178	0.169	0.210	0.178
Mean Income (yuan)	4,959	6,718	8,366	11,746	21,187	31,739
Observations	12,611	9,087	11,306	9,262	11,111	8,776

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).
2. Values for income inequality indices were calculated using Eq. 5.1.
3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.
Source: Author's calculation using CHIP data.

The results of the spatial decomposition following equation 5.1 are displayed in Table 5.5, which shows that, with regards to household income per capita, in 1995 cities with ETDZs have lower measures of inequality compared to cities without ETDZs, but these seem to converge by 2002, where the inequality measures are almost the same. The same can be observed with regards to inequality of disposable household income per capita, which is slightly lower in cities with ETDZs than in cities without ETDZs. There is a significant difference in mean incomes, however, where cities with ETDZs have higher mean incomes than in cities without ETDZs for both years. Compared to cities without ETDZs, cities with ETDZs have an household income per capita that is 25% and 22% higher for 1995 and 2002, respectively, while having a disposable household income per capita that is 35% and 40% higher for 1995 and 2002, respectively. Table 5.6 shows that when decomposed by region, the convergence mentioned before is driven by an increase in inequality measures in the West; but

in the Center, and, especially, in the East, mean incomes are higher, and income inequality measures are lower in cities with ETDZ than in cities without ETDZs, although the gap decreased from 1995 to 2002, but then widened again in 2013.

Table 5.6: Income inequality between cities with and without ETDZs, by region

	1995		2002		2013	
	Cities without ETDZs	Cities with ETDZs	Cities without ETDZs	Cities with ETDZs	Cities without ETDZs	Cities with ETDZs
	Disposable Household Income Per Capita					
West						
Gini	0.272	0.380	0.288	0.298	0.322	0.283
MLD	0.127	0.294	0.144	0.150	0.179	0.134
Theil	0.149	0.610	0.134	0.153	0.170	0.135
Mean Income (yuan)	4,642	5,833	8,382	9,230	18,465	24,807
Center						
Gini	0.254	0.236	0.284	0.275	0.319	0.301
MLD	0.110	0.101	0.143	0.127	0.182	0.169
Theil	0.107	0.092	0.133	0.127	0.178	0.152
Mean Income (yuan)	3,903	4,997	6,996	9,048	19,566	29,278
East						
Gini	0.373	0.289	0.349	0.298	0.352	0.307
MLD	0.237	0.134	0.205	0.146	0.214	0.163
Theil	0.307	0.142	0.219	0.144	0.242	0.177
Mean Income (yuan)	7,184	7,907	10,655	14,548	25,269	36,652

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).
2. Values for income inequality indices were calculated using Eq. 5.1.
3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.
Source: Author's calculation using CHIP data.

Compared to cities without ETDZs, cities with ETDZs have a disposable household income per capita that is 35% and 40% higher for 1995 and 2002, respectively. Table 5.6 shows that when decomposed by region, the convergence mentioned before is driven by an increase

in inequality measures in the West; but in the Center, and, especially, in the East, mean incomes are higher, and income inequality measures are lower in cities with ETDZ than in cities without ETDZs, although the gap decreased from 1995 to 2002.

5.3.2 Income Inequality in High-Tech Industrial Development Zones

Table 5.7: Income inequality between cities with and without HIDZs

	1995		2002		2013	
	Cities without HIDZs	Cities with HIDZs	Cities without HIDZs	Cities with HIDZs	Cities without HIDZs	Cities with HIDZs
	Disposable Household Income Per Capita					
Gini	0.335	0.320	0.343	0.309	0.351	0.315
MLD	0.188	0.183	0.200	0.159	0.216	0.171
Theil	0.222	0.257	0.201	0.164	0.220	0.184
Mean Income (yuan)	5,297	6,333	9,260	10,838	23,365	30,165
Observations	13,359	8,339	12,427	8,182	12,634	7,253

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).
2. Values for income inequality indices were calculated using Eq. 5.2.
3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.
Source: Author's calculation using CHIP data.

The spatial decomposition using equation 5.2, shown in Table 5.7, indicate that household income per capita is 16% and 9% higher in cities with HIDZs than in cities without HIDZs for 1995 and 2002, respectively. Inequality of household income per capita is also lower for cities with HIDZs compared to cities without HIDZs for both of the years mentioned. Furthermore, cities with HIDZs have a disposable household income that is 20% and 17% higher than cities without HIDZs for 1995 and 2002, respectively. Inequality of disposable household income is also lower for cities with HIDZs compared to cities without HIDZs for both years. The gap in inequality of disposable household income seems to have widened from 1995 to 2002. Furthermore, inequality of disposable household income per capita in cities with HIDZs decreased from 1995 to 2002.

The decomposition by region in Table 5.8 shows that in the West, income inequality is higher in cities with HIDZs than in cities without HIDZs. The opposite is true in the Center and East, where mean incomes are higher, and income inequality measures are lower in cities with HIDZs than in cities without HIDZs. Furthermore, it can be seen that in the Western and Eastern regions, inequality of disposable income per capita decreased for cities with HIDZs from 1995 to 2002.

Table 5.8: Income inequality between cities with and without HIDZs, by region

	1995		2002		2013	
	Cities without HIDZs	Cities with HIDZs	Cities without HIDZs	Cities with HIDZs	Cities without HIDZs	Cities with HIDZs
	Disposable Household Income Per Capita					
West						
Gini	0.272	0.380	0.288	0.298	0.323	0.284
MLD	0.127	0.294	0.144	0.150	0.182	0.135
Theil	0.149	0.610	0.134	0.153	0.172	0.135
Mean Income (yuan)	4,642	5,833	8,382	9,230	18,492	24,634
Center						
Gini	0.255	0.236	0.285	0.272	0.321	0.302
MLD	0.112	0.100	0.144	0.124	0.184	0.168
Theil	0.108	0.092	0.135	0.124	0.179	0.153
Mean Income (yuan)	3,917	4,962	6,984	9,054	19,879	29,663
East						
Gini	0.342	0.304	0.347	0.302	0.351	0.318
MLD	0.199	0.152	0.207	0.149	0.214	0.174
Theil	0.234	0.173	0.201	0.154	0.223	0.199
Mean Income (yuan)	7,888	7,366	12,743	13,273	29,393	35,171

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

2. Values for income inequality indices were calculated using Eq. 5.2.

3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.

Source: Author's calculation using CHIP data.

5.3.3 Income Inequality by Number and Type of Zones

Table 5.9: Income inequality between cities by number of zones

	1995				2002				2013			
Zones	0	1	2	3	0	1	2	3	0	1	2	3
	Disposable Household Income Per Capita											
Gini	0.316	0.307	0.285	0.271	0.310	0.304	0.281	0.299	0.323	0.317	0.310	0.273
MLD	0.172	0.156	0.157	0.121	0.166	0.156	0.133	0.152	0.186	0.174	0.168	0.122
Theil	0.218	0.168	0.252	0.119	0.167	0.150	0.133	0.143	0.193	0.174	0.183	0.122
Mean Income (yuan)	4,751	7,568	5,689	12,172	7,997	14,881	9,805	19,426	19,740	35,049	29,119	36,150
Observations	11,223	3,524	6,327	624	10,440	2,888	6,669	612	9,858	4,029	5,506	494

Source: Created by Author using CHIP data.

Table 5.10: Income inequality between cities by number of zones, by region

	1995				2002				2013			
Zones	0	1	2	3	0	1	2	3	0	1	2	3
	Disposable Household Income Per Capita											
West												
Gini	0.272	-	0.380	-	0.288	-	0.298	-	0.323	0.262	0.283	-
MLD	0.127	-	0.294	-	0.144	-	0.150	-	0.182	0.111	0.134	-
Theil	0.149	-	0.610	-	0.134	-	0.153	-	0.172	0.107	0.135	-
Mean Income (yuan)	4,642	-	5,833	-	8,382	-	9,230	-	18,492	17,639	24,807	-
Center								-				-
Gini	0.257	0.204	0.237	-	0.287	0.247	0.275	-	0.318	0.258	0.314	-
MLD	0.113	0.066	0.103	-	0.146	0.097	0.128	-	0.182	0.120	0.184	-
Theil	0.110	0.065	0.093	-	0.136	0.097	0.128	-	0.179	0.108	0.166	-
Mean Income (yuan)	3,892	4,231	5,086	-	6,938	7,839	9,209	-	19,153	28,770	29,676	-
East												
Gini	0.397	0.291	0.234	0.271	0.344	0.271	0.258	0.299	0.326	0.321	0.311	0.273
MLD	0.265	0.142	0.091	0.121	0.199	0.122	0.109	0.152	0.189	0.177	0.171	0.122
Theil	0.353	0.153	0.101	0.119	0.220	0.120	0.110	0.143	0.223	0.178	0.211	0.122
Mean Income (yuan)	7,096	8,253	6,116	12,172	9,568	16,647	11,035	19,426	21,901	36,669	35,425	36,150

Source: Created by Author using CHIP data.

Table 5.9 shows the results of the spatial decomposition from equation 5.3. Regardless of the number of zones in a city, mean household income per capita and disposable household incomes are always higher in cities with zones than in cities without any zones. Furthermore, it can be seen that by 2002 inequality of disposable household income decreases as the number of zones increases, with the exception of Guangzhou, the only city with three zones. When aggregated by region, as shown in Table 5.10, once more it is evident that the West has a reverse trend with regards to the other regions. Western cities have either no zones or two zones, the latter having higher inequality, which has decreased from 1995 to 2002. In the Center and East it is clear that cities that have no zones have higher income inequality measures than cities with zones. In the center, cities with only 1 zone have the lowest inequality. While in the east, the number of zones has a negative relation to income inequality, excluding Guangzhou.

Since there is an overlap, where some cities have both an ETDZ and an HIDZ, a further decomposition of cities by type of zone is necessary to account for this. The results of this decomposition using equation 5.4, shown in Table 5.11, indicate that in the central region, cities with only HIDZs have higher incomes and lower inequality than cities with only ETDZs and cities with both ETDZs and HIDZs. However, the opposite is true in the eastern region, where ETDZs have higher incomes and lower inequality measures than the other cities. Having both an ETDZ and HIDZ, however, produces lower mean incomes and higher inequality levels than having only an ETDZ or HIDZ.

Table 5.11: Income inequality between cities by type of zones and by region

	1995				2002				2013			
Zones	No Zone	ETDZ only	HIDZ only	Both Zones	No Zone	ETDZ only	HIDZ only	Both Zones	No Zone	ETDZ only	HIDZ only	Both Zones
	Disposable Household Income Per Capita											
West												
Gini	0.272	-	-	0.380	0.288	-	-	0.298	0.323		0.262	0.283
MLD	0.127	-	-	0.294	0.144	-	-	0.150	0.182		0.111	0.134
Theil	0.149	-	-	0.610	0.134	-	-	0.153	0.172		0.107	0.135
Mean Income (yuan)	4,642	-	-	5,833	8,382	-	-	9,230	18,492		17,639	24,807
Center								-				
Gini	0.257	0.213	0.190	0.237	0.287	0.259	0.235	0.275	0.318	0.268	0.238	0.314
MLD	0.113	0.075	0.056	0.103	0.146	0.108	0.086	0.128	0.182	0.133	0.092	0.184
Theil	0.110	0.073	0.057	0.093	0.136	0.109	0.085	0.128	0.179	0.117	0.090	0.166
Mean Income (yuan)	3,892	4,363	4,102	5,103	6,943	7,768	7,905	9,209	19,153	28,370	29,600	29,676
East												
Gini	0.397	0.263	0.324	0.297	0.344	0.261	0.291	0.302	0.326	0.307	0.349	0.304
MLD	0.265	0.112	0.184	0.141	0.199	0.115	0.135	0.149	0.189	0.165	0.204	0.160
Theil	0.353	0.114	0.223	0.156	0.220	0.110	0.145	0.154	0.223	0.163	0.213	0.192
Mean Income (yuan)	7,096	8,783	7,353	7,371	9,568	17,222	15,115	12,908	21,901	37,676	34,242	35,576

Notes: 1. All calculations made using Constant 2002 prices using the PPP-adjusted Urban CPI for each province by Brandt and Holz (2006).

2. Values for income inequality indices were calculated using Eq. 5.4.

3. The mean difference in income inequality between the two groups is statistically significant at a five percent confidence level or higher.

Source: Author's calculation using CHIP data.

5.3.4 Why is having both DZs counterproductive?

In Table 5.11 it is evident that cities having both an ETDZ and HIDZ do not reflect higher mean incomes and lower income inequality measures than cities just having one type of development zone. It was concluded that having both zones is counterproductive at maximizing the benefits.

HIDZs are supposed to attract higher skilled labor; 23 percent of the workforce in HIDZs are scientists (Fu & Gao, 2007, p. 35). Perhaps by having only one type of zone, the types of skilled labor required remains concentrated and there is less variation in skills and consequently less variation in incomes, reflected in lower inequality. But if both zones are included then they compete for skilled labor from each other and allow for a wider range of skills and incomes.

Table 5.12 shows that cities with only HIDZs have a lower average years of education than cities with only ETDZs or both zones. The same is true for the share of the workforce with a tertiary education. While average household size is similar for all types of cities, the percentage of female workers is lowest in cities with no zones at 46.3% and highest in cities with HIDZs only, followed by cities with ETDZs only and cities with both zones, with shares of 47.4%, 45.7%, and 45.6%, respectively. The share of dependents is also highest in cities without zones at 46.3%, while in cities with zones, HIDZs, have the highest share of 25.2%, followed by cities with ETDZs and both zones with shares of 21.7% and 24.6%, respectively. Finally, the shares of types of work unit differs within the different city types. Cities with HIDZs have the highest share of workers in enterprises with 72.6%, compared to 58.3% in cities with ETDZs only, 60.7% in cities with both zones, and 56.5% for cities without zones. Conversely, cities with HIDZs have the lowest share of Government and Institutional employees at 27.4% compared with cities with ETDZs, cities with both zones, and cities with no zones, which have 41.7%, 39.3%, and 43.5%, respectively.

Table 5.12: Descriptive statistics of labor force in CHIP 2002 urban sample by type of zone

Variable	No Zone	ETDZ only	HIDZ only	Both Zones
Average Age	39.3	41.7	40.5	40.0
Average Years of education	11.0	12.0	11.2	11.6
Tertiary Education (%)	30.2	32.8	29.0	31.4
Work in Enterprise (%)	56.5	58.3	72.6	60.7
Work in Government/ Institution (%)	43.5	41.7	27.4	39.3
Average Household size	3.2	3.1	3.2	3.2
Female (%)	46.3	45.7	47.4	45.6
Dependents (%)	28.6	21.7	25.2	24.6

Source: Created by Author using CHIP data.

$$y = X\beta + \epsilon \quad \text{(5.5)}$$

Table 5.13 shows the OLS regression estimates for the dependent variable of household disposable income per capita and the selected explanatory variables, in which the coefficients for mean age, years of education, tertiary education and household size are all significant and display the expected signs. The female dummy, however, is not significant, and indicates a negative coefficient.

Model 3 shows the interactions between the Government work unit dummy variable and the different city types. If the coefficients are interpreted as the returns to having government employment, then government incomes in cities with ETDZs only and cities with HIDZs only could be more than three times higher than in cities with both zones and more than 11 times higher than in cities without zones. Similarly, the returns to higher education are highest in cities with ETDZs only, followed by cities with HIDZs only, cities with both zones and finally cities with no zones, shown in Model 4.

Table 5.13: Regression estimates (dependent variable: household disposable income per capita)

Variable	Model 1	Model 2	Model 3	Model 4
Mean Age	44.4***	37.9***	27.6***	28.8***
Mean Years of Education	774.4***	694.5***	538.5***	572.5***
Tertiary	1386.9***	1692.6***	1675.7***	
Household size		-1650.1***	-1605.4***	-1618.0***
Female		-104.9	-86.2	-109.1
Dependents		-401.9***	34.2	-217.8**
ETDZ#GOV			8827.3***	
HIDZ#GOV			8565.0***	
Both#GOV			2800.5***	
ETDZ#tertiary				8533.0***
HIDZ#tertiary				5541.4***
Both#tertiary				3610.8***
Adjusted R Squared	0.1369	0.1792	0.2695	0.2655
Observations	19,511	19,511	19,511	19,511

Note: *,**,*** indicates significance at 10%,5%, and 1%, respectively.

Source: Created by Author using CHIP data.

Since cities with both zones have 39.3% of its workforce in non-enterprise work units and 31.4% of its workforce with tertiary education, it is possible that the lower returns from these factors are contributing to the lower income levels and possibly the higher inequality measures compared to cities with only one type of zone.

Chapter 6: Discussion and Policy Implications

The analyses from the preceding two chapters have yielded many results regarding the relationship between preferential policies and development strategies with disposable household income inequality in urban China. This chapter discusses each of the main findings from each chapter and derives policy implications for both China and developing countries.

6.1 Preferential Policies and Income Inequality

The objective of Chapter Four was to analyze the effect of the preferential policies and autonomies granted to cities, citywide, on income inequality in China, contributing to the literature gap in both the fields of preferential policies and income inequality. The research only analyzes inequality of disposable household income per capita of the urban population covered by the CHIP surveys. It does not include other types of economic inequalities, or cities that are not included in the selected datasets. This chapter produced several important findings.

The first main finding reveals that the cities that have been granted preferential policies have higher mean incomes and lower income inequality than other cities. While higher incomes are consistent across regions and throughout the different sample years, the lower income inequality is prevalent in the East and Center, but not in the West for 2002, although the trend suggests that the Western region is rapidly converging. By 2013, income inequality is lowest in SEZ/OCs across all regions. Furthermore, the trend from 1995 to 2002 shows that income inequality decreased in cities with preferential policies while increasing in other cities. Previous literature highlighted that overall urban inequality had remained slightly unchanged during this period. The results from this research show that this phenomenon was driven by the decrease in income inequality reflected in the cities with preferential policies while the trend in other cities was of growing inequality; thus, this research contributes to understand the results of

other studies by providing an additional perspective and an additional level of decomposition for urban inequality. Additionally, for every socioeconomic stratification subgroup, those residing in cities with preferential policies had higher mean incomes and lower income inequality than their counterparts in cities without preferential policies.

The second main finding is that location and tertiary education are the largest contributors to inequality. The different regions in China have different stages of development and have pursued different development strategies, so it is unsurprising that location is the largest contributor. The returns to higher education appear as a major driver of income inequality as incomes from having obtained higher education are considerably higher especially in households that have more than one member with higher education. This manifestation is particularly evident in cities with preferential policies, as the returns mentioned are not as dramatic in other cities.

The third main finding is that the poorest households are better off in cities with preferential policies than in other cities. There are more households benefitting from housing subsidies and living in public housing in cities with preferential policy than in other cities. Furthermore, these subsidies, along with subsidies for health and minorities, have a larger impact on the incomes of households in cities with preferential policies. Lastly, the poorest households in cities with preferential policy have a higher share of income than their counterparts in other cities. Therefore, cities with preferential policies may have welfare systems that are more efficient in providing for their poor than other cities; a clear benefit from their autonomy to experiment with different types of welfare systems.

The fourth main finding is that regression estimates revealed changing trends regarding industry dummies. By 2002, manufacturing and construction were negatively correlated with income in SEZs and OCs but positively correlated in other cities. This relationship persisted in the 2013 sample. Comparably, the returns to finance where almost ten times higher in cities

with preferential policies than in other cities. Similarly, the returns to retail were much higher in SEZs and OCs than in cities without preferential policies.

6.1.1 Policy Implications for China

The main findings from this research regarding the Chinese model of preferential policies and autonomy have several policy implications. The following considerations based on the findings of this study may help improve the existing Chinese model or enhance the design and implementation of new models of granting preferential privileges to cities.

The debate on Preferential Policies

Previous literature often link preferential policies to growing regional disparities in China and some advocate for the abolition of such preferential statuses. This research however, reveals that when analyzed at the city level, preferential policies in SEZs and OCs have been conducive to lower inequality levels than other cities. The country is continually transitioning from a state-managed economy towards a market-oriented economy. The preferential policies have served as a mechanism for this transition and should therefore not be removed. It is therefore the imperative of this research that if the preferential treatment is to be abolished it should be done by extending as many of the preferential policies of SEZs and OCs to the rest of China.

Location

Location is the largest contributor to income inequality in urban China. However, its contribution is smaller in SEZs and OCs than other cities. Previous studies have suggested that even without the preferential policies, regional disparities would still be evident because the geographical advantages and disadvantages for each region would still play a dominant role in economic development. The results from Chapter Four indicate that having preferential policies

reduces the "geographical limitations" as measured by the contribution of location to overall inequality. These implications, further examined in Chapter Five, further corroborate the notion that market-oriented autonomies or preferential policies should be extended to other areas in order to minimize geographical influences.

Tertiary Education

Tertiary education is a high contributor of income inequality. China's free compulsory education (FCE) programs only cover the first nine years of education. As the economy keeps expanding and moving towards a knowledge-based, service-oriented economy, the need for higher human capital becomes larger and imminent. Expanding the FCE programs to include high school and tertiary education would be ideal, however, the feasibility of this feat appears low at the moment.

Among the many distinctions between education in SEZs and OCs with other cities, the autonomy enjoyed by the former stands out. SEZs and OCs have diversified channels of educational funding, as discussed in Chapter 2, as they are not covered by the TEOS policy and FCE programs. Cities without preferential policies are highly dependent on these equalizing programs, which are meant to ensure students with low incomes can have access to education. However, these programs may not cover costs sufficiently. Cities without preferential policies should reduce their reliance on these programs by complementing then with additional sources of financing. A hybrid system, which combines the centralized subsidies with market-oriented education systems could be a possible solution to this conundrum.

Furthermore, ensuring increased access and enrollment to higher education may help reduce income inequality in the medium- and long-term. Preferential policies should promote and encourage this target. This multifaceted problem can be addressed by offering fiscal incentives, such as tax reductions or exemptions, for educational institutions, domestic and foreign, that increase access and enrollment to tertiary education. These same incentives can be

offered to private firms that give scholarships and grants towards this same goal. The market incentive, therefore, provides increased profits, through decreased taxes, to educational institutions and firms; they provide increased access to tertiary education for the residents; and reduce the burden of the state or local authority in reaching these goals. Furthermore, ensuring rural migrants can take the entrance examination in their city of residence instead of their hometown will further advance these goals. It may be inferred that by further increasing educational attainment may in turn lead to decreased income disparities.

Supply-side Reforms

In recent years, economic growth in China began to slow, entering a "New Normal", period of moderate growth. This "New Normal" of 4-6% growth is differentiated from the previous period of "Rapid Growth" in which China grew at 10% for thirty years. The previous rapid growth was driven by industry and investment. Much of this investment was aimed at infrastructure development and manufacturing, most of which was spearheaded by SOEs and Province-led projects. Following the 2008 Global Financial Crisis, the PRC engaged in a fiscal stimulus package of four trillion yuan over two years at 7% of GDP per years. (Woo & Zhang, 2011) In order to prevent waste, the stimulus was used to bring forward investment projects that would have been inevitably implemented such as hard infrastructure (roads, bridges, ports, high-speed trains, and telecommunications), emerging industries (alternative energy) and urbanization (housing to accelerate rural to urban migration).

Table 6.1: Overcapacity in China

	Capacity (million ton)			Utilization Rate (%)	
	2008	2014	% increase	2008	2014
Crude Steel	644.0	1,140.0	77.0	80	71
Electrolytic Aluminum	18.1	38.1	110.5	78	76
Cement	1,870.0	3,100.0	65.8	76	73
Oil Refining	391.0	686.0	75.4	80	66
Flat Glass	650.0	1,046.0	60.9	88	79
Paper & Paperboard	89.0	129.0	44.9	90	84

Source: European Union Chamber of Commerce in China (2016).

Following the aforementioned infrastructure boom at the end of the first decade of this century, the country has become plagued with industrial overcapacity, particularly in industries relating to steel, electrolytic aluminum, cement, oil refining, flat glass, and printing as shown in Table 6.1. Reducing this overcapacity will be key in implementing supply-side reforms, transitioning from an industry-driven economy towards a service-driven economy. The government has already began plans to downsize steel production and other labor-intensive manufacturing SOEs. This trend will only continue.

The regression estimates from Chapter Four, reveal that manufacturing is only negatively correlated with income in SEZs and OCs, and it is positively correlated in other cities, indicating that the latter might be more dependent on manufacturing than the former. Additionally, construction was positively, significantly correlated with income only in cities without preferential policies. Retail, on the other hand, is positively correlated with household disposable incomes only in SEZs and OCs. As the country prepares to transition towards a service-oriented economy, while reducing industrial overcapacity, it is evident from these results that cities without preferential policies would be affected negatively from that transition. From the CHIP datasets, one could infer that SEZs and OCs are better suited for such a transition, while other cities might be more vulnerable to such reforms in the future. It is therefore advisable that urban areas reduce the reliance on the manufacturing sector to help ease this

transition. This will include skills retraining and upgrading programs, which are ubiquitous in SEZs and OCs, but have yet been implemented in many other cities.

6.1.2 Policy Implications for Developing Countries

Preferential policies have played a vital role in the experimentation and reforms fomenting China's extraordinary growth over the last three decades. While these policies might seem attractive to other countries at similar stages of development seeking to boost economic growth and job creation, the fear of increasing disparities in welfare through said policies is always present. This dissertation investigated whether cities with preferential policies had higher income inequality than cities without preferential policies. The results indicate that cities with preferential policies did not experience higher increases in inequalities of household disposable income per capita. Cities receiving preferential policy status were able to increase disposable household income per capita at higher rates while increasing inequality outcomes at lower rates than cities not receiving preferential policies within the same region. These results, however, are not to be taken as evidence that preferential policies reduce inequality. Reduction in inequality must be actively pursued, and the special characteristics of the Chinese preferential policies must also be taken into account. In addition to the policy implications given in the previous section, the following are recommendations for developing countries that are seeking to model Chinas SEZs.

First, the preferential status and autonomy granted to SEZs were done so as a social experiment with market policies. With scientific experiments, when investigating the impact of a particular treatment, there is always a control group that does not receive the treatment and serves as the basis for comparison, thus revealing the effect of the treatment. Without the control, results cannot be attributed to the treatment. By granting preferential policies and autonomy to only some cities and not others, China had a control group in the other cities. However, this was not a randomized control trial since the cities receiving preferential policies had geographical

and physical endowments that might have given them an advantage prior to their selection. Nonetheless, this experimental approach can be applied to any policy that is being considered for nationwide implementation. Allowing it to be implemented by a few on a temporary basis will allow for proof of its effects and speed up national implementation, which may be held up by lengthy debates based on ideological and opinionated arguments instead of evidence. Furthermore, because there is a control group, the effects of the policy can be ascertained while reducing the uncertainty of unknown biases or externalities.

Second, this study demonstrates that preferential policies and autonomy that was implemented citywide has reduced inequality, while increasing incomes. Hence, scale is an important factor. Most of the preferential statuses granted outside of China, are given to zones that are small in size, and only a few individuals or enterprises are able to reap the benefits offered. Furthermore, by restricting the preferential status to certain functions such as manufacturing or trade, only certain employers and employees are affected. Therefore, by granting said statuses on a citywide scale, it ensures that all the residents are directly affected, instead of just indirectly, and by allowing autonomy with regard to function and implementation, a wider range for the impact of these preferential policies is cast. Complementing the previous policy implication, in evaluating the impact of policies, perhaps the appropriate scale are cities, rather than larger (province or national) or smaller ("zones", industries, or enterprises).

Third, the Chinese SEZs are not concession zones which only focus on fiscal incentives. Instead, they are reform-oriented zones based on policy experimentation. While fiscal incentives may attract FDI, FDI wasn't the main source of investment in the Chinese SEZs. Domestic investment is needed, as well as interaction with the rest of the nation, either through the absorption of surplus labor, purchase of raw materials, skills development through higher education institutions, labor mobility and technological transfer.

Fourth, the focus of the policies is comprehensive and not narrow. Focusing only on export-oriented growth may hinder progress in other areas in need of reform. Chinese SEZs

experimented with policies that went beyond economic growth, including, but not limited to, welfare programs, skills upgrading, healthcare, and educational reform. Furthermore, the preferential policies are constantly changing and upgrading. While in the first decade, the focus was to develop a low-wage manufacturing sector, in the second decade, the efforts changed to developing high-grade technology and industries. In the third decade, research and innovation were emphasized. Preferential policies have a diminishing advantage which is why these cities must constantly push the boundary of policy innovation.

Fifth, the administrations of the SEZs and OCs had considerable autonomy to enact their own laws. Autonomy is what allows for the policy experiments to take place. Additionally, even though autonomy with regard to the preferential policies is an important component of the Chinese model, it is clear that a more efficient welfare system improves the income shares of the poorest households. Therefore, when granting preferential status, it can be made contingent on the condition that welfare systems be implemented or improved to ensure that households earning less receive more transfers as part of their income. How to implement these systems would remain at the discretion of the administrative authority, but certain standards and accountability systems could be implemented to ensure proper effort and resources are dedicated for this purpose. Furthermore, ensuring that these policies also promote the educational and other welfare goals could also be a condition of receiving preferential policy status.

6.2 Development Zone Strategies and Income Inequality

Location is a major contributor to income inequality. In China, the different regions possess distinct geographical features and are at different stages of development. Chapter Five was aimed at deciphering whether the different development zone strategies undertaken at the city level across China had produced differences in income and inequality outcomes.

The results from the analyses in Chapter Five reveal how the adoption of heterogeneous development zone strategies via the implementation of ETDZs and HIDZs has led to different outcomes in terms of income growth and income inequality across urban China.

Having a Development Zone is better than not having one

Cities without an ETDZ or HIDZ have the lowest mean incomes and highest income inequality indices in urban China. These results are consistent across all regions. It is, therefore, recommended that having a DZ is better than not having one. The fiscal incentives offered in each of the DZs are very specific and are aimed at developing particular industries while attracting skilled labor. This in turn can have a positive impact in the demand for highly skilled labor which could in turn increase the supply of university graduates.

Optimization through Specialization

The results also suggest that cities should pursue specialized development zone strategies instead of diversified ones, since cities which had both an ETDZ and HIDZ, were outperformed by those which only had one type of DZ. While having both types of zone might appear attractive because they would offer a higher output and higher growth rates, the results indicate that having both will be counterproductive in achieving growth and equality targets. It would seem that having two types of DZs results in them competing with each other for resources.

In order to optimize a better balanced growth, it is recommended that cities take into account their geographical advantages and try to match them with the objectives of each DZ. ETDZs were able to outperform HIDZs only in the eastern region but not in the central and western cities. These results suggest that ETDZs have a higher optimization where access to trade is highest. The coastal cities have access to ports and it would therefore behoove them to have ETDZs instead of HIDZs.

ETDZs in inland cities were not able to perform as well as their coastal counterparts given that they lack access to ports and therefore have higher transportation costs. On the other hand, HIDZs are aimed at developing domestic industries and commercializing technologies for domestic markets. HIDZs outperformed ETDZs in terms of more balanced growth in central and western cities. It is therefore, recommended that inland cities should consider specializing in HIDZs over ETDZs.

However, the "One Belt, One Road" (OBOR) strategy disclosed in previous years will connect central and western provinces via railroad to Central Asia, the Middle East and Europe. Not only would inland cities have trade access to these markets, but the freight time will be half that of current sea routes. This development will allow inland cities to compete with coastal cities in trade performance. This turn of events could allow cities with ETDZs on central and western China to improve performance. Cities should therefore take into account whether they wish to specialize in trade performance or domestic markets in order to maximize their future performance.

Chapter 7: Conclusion

The Chinese model of preferential policies and autonomy is a policy instrument implemented to foment gradual economic reform and liberalization during the nation's transition from a managed economy towards a market economy. The Special Economic Zones and Open Cities that benefit from these preferential statuses differ from other zones worldwide that may share the same name, in scale and function. In China, entire cities receive these statuses, which are meant for a comprehensive range of functions, covering trade, finance, welfare, labor, market, and administrative reforms, while, in other countries, they are usually small in scale and mostly trade-related or singular functions, similar to the Development Zones of China. Preferential policies have been engines for China's breakneck growth over the last three and half decades and have served as mechanisms for reform and gradual transition.

While the effects of preferential policies on economic growth, trade performance and FDI have been thoroughly examined, the effects on income inequality have been under-researched. Income inequality has risen since China embarked on its transition towards a market-oriented economy, therefore this dissertation investigated the relationship between preferential policies and inequality of household disposable income per capita in urban China. It answered two research questions in two of its chapters.

Earlier in this dissertation, two plausible theories on how preferential policies might influence income inequalities in cities were offered. The first argument was based on the expected unbalanced growth that accompanies market capitalism: that because of the larger degree of decentralization and deregulation that is enjoyed by SEZs and OCs, coupled with more liberalized market policies, the rapid gains in economic growth would create higher income inequality within these cities by rewarding those with higher skills, experience, and performance at much higher rates than those with lower competencies. The second theory

emphasized the power of social programs at redistributing the gains and opportunities created from rapid growth. These were predicated around providing better employment opportunities, social welfare programs, skills upgrading schemes, and greater financing for social spending. The results from this dissertation appear to support the second theory over the first.

Chapter Four sought whether preferential policies led to higher income inequality. The results indicated that this was not the case. By 2013, cities with preferential policies not only had higher incomes but lower income inequality than cities without preferential policies across all regions. Overall, it can be concluded that, in the case of urban China, citywide preferential policies and autonomy have contributed to reduce income inequality while increasing mean incomes from 1995 to 2002. These results are consistent with both bodies of literature it contributes to. The literature on SEZs, specifically in China, state that the autonomy granted to these cities allowed their administrators the freedom to experiment with different policies, including welfare systems, bringing about experience and expertise on the advantages and disadvantages of the different systems, allowing to select and/or improve the provision and implementation of these systems and policies. Moreover, the literature on inequality in China, illustrate that education has increased as an important influence of incomes and as a growing source of inequality. Furthermore, higher incomes and better provisions of services and health finance, are reflected as having lower inequality in urban areas compared to rural. Following this same logic model, cities with preferential policies have higher incomes and better provisions of services, and, therefore, lower a lower inequality, than other cities.

Furthermore, this research contributes to the debate on whether preferential policies should be removed by providing evidence that their success should be extended instead. Preferential policies have also given SEZs and OCs an advantageous position regarding upcoming supply-side reforms. Lastly, the importance of tertiary education in income disparities is evident. As China continues through its transitions towards a knowledge-, service-,

and consumer-driven economy, the country must consider increasing its human capital in order to create a more balanced and harmonious society.

Chapter Five, following evidence of the importance of location from Chapter Four, investigated how different development zone strategies via the creation of Development Zones influenced income inequality. The results indicate that having a zone was better than not having one, regardless of the type of zone. But cities that specialized in just one type of zone had better results over cities that chose to implement both. This specialization was region-specific. Cities with ETDZs performed better in the eastern region, where access to trade is greater, while cities with HIDZs, which are aimed at developing domestic industries, performed better in the central region.

7.1 Limitations and Further Research

One of the major limitations for this research was the availability of data, especially recent data. The main analyses performed in this dissertation excluded the 2007 wave of survey data from the China Household Income Project because of inconsistencies in variables and lack of availability which created sampling variability problems. An effort was made in Chapter Four to control for these confounding factors, but the main results exclude the 2007 data. This research can be further extended to include future waves of the CHIP data and/or other sources of raw data as they become available. Furthermore, this study only reveals the effect of preferential policies on disposable household per capita income inequality but not other forms of economic and social inequality. Similarly, the analyses from this research can be extended to analyze inequality in wealth, education, health and other welfare and standard of living indicators.

While the analyses conducted in this research was done at the city level at a relatively large scale of up to 125 cities, a case study analysis of a few cities can provide further insights

into the effects of specific policies, in order to identify the optimal policy mix to reduce inequality while increasing income. A combination of quantitative and qualitative research methods can prove valuable in developing and building theories and models that can make contributions to the theoretical literature.

Additionally, China is currently involved in the creation of SEZs in Africa and Latin America based on its preferential policy model and other countries have announced during the last decade their intent on replicating the Chinese model. Further research can involve the design of a policy framework for creating and developing cities with preferential policies as part of national urbanization projects. There is still much to learn from the Chinese experience of experimental policy treatments. Further research may be conducted to ascertain the influencing factors and policies for the corresponding increases and decreases in income inequality established in this dissertation. Future research could also explore the mechanisms and specific policy levers through which citywide preferential policies affect inequalities of income and educational attainment.

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Appendix 1: Population Shares of Cities with Preferential Policies

Table A1.1: Population shares of OCs

Province	Individuals in OCs	Total Individuals	Share of OC/Province	Individuals in OCs	Total Individuals	% Share of OC/ Province
Beijing	0	1456	0%	0	13569194	0%
Anhui	569	1476	39%	6582805	58999948	11%
Chongqing	832	832	100%	12474851	30512763	100%
Gansu	596	1194	50%	3142523	25124282	13%
Guangdong	780	1763	44%	28928271	85225007	34%
Henan	585	2086	28%	6656759	91236854	7%
Hubei	1015	2063	49%	12462008	59508870	21%
Jiangsu	262	2163	12%	12082832	41824412	29%
Liaoning	770	2111	36%	8284216	41824412	20%
Shanxi	590	1937	30%	3344392	32471242	10%
Sichuan	586	1703	34%	17370332	82348296	21%
Yunnan	294	1848	16%	33768611	42360089	80%
Total	6879	20632	33%	145097600	605005369	24%

Source: Compiled by Author using CHIP data and NBS 2000 Census.

Table A1.1 shows the population shares of individuals in OCs in each province for the CHIP 2002 sample and the NBS 2000 Census. The table shows that out of the 12 provinces, eight of them are overrepresented (Anhui, Gansu, Guangdong, Henan, Hubei, Liaoningm Shanxi, and Sichuan), while two are underrepresented (Jiangsu and Yunnan).

Table A1.2: Population shares of eastern cities

Province	City	Observations	% of Subgroup	% of CHIP
With ETDZ				
Beijing	Beijing	1,456	19.4	7.1
Jiangsu	Nanjing	442	5.9	2.2
Liaoning	Shenyang	770	10.3	3.7
	Subtotal	2668	55.6	12.9
Without ETDZ				
Guangdong	Foshan	155	2.1	0.8
Guangdong	Huizhou City	157	2.1	0.8
Guangdong	Puning	189	2.5	0.9
Guangdong	Shaoguan City	149	2.0	0.7
Guangdong	Shunde City	178	2.4	0.9
Guangdong	Zhaoqing City	155	2.1	0.8
Jiangsu	Dafeng City	141	1.9	0.7
Jiangsu	Suqian	179	2.4	0.9
Jiangsu	Taixing	159	2.1	0.8
Jiangsu	Wuxi	289	3.9	1.4
Jiangsu	Xuzhou	286	3.8	1.4
Jiangsu	Yangzhou	274	3.7	1.3
Jiangsu	Yixing	131	1.7	0.6
Liaoning	Changtu County	140	1.9	0.7
Liaoning	Jinzhou City	284	3.8	1.4
Liaoning	Wafangdian	147	2.0	0.7
	Subtotal	3,013	20.2	15.6
Total		**5,681**	**75.8**	**27.53**

Source: Compiled by Author using CHIP data and NBS 2000 Census.

Tables A1.2 and A1.3 show the population shares of each OC in the 2002 CHIP sample by region..

Table A1.3: Population shares of central and western cities

Province	City	Observations	% of Subgroup	% of CHIP
Center				
Anhui	Shexian County	151	2.0	0.7
Shanxi	Hunyuan County	163	2.2	0.8
Henan	Huixian	170	2.2	0.8
Anhui	Bengbu City	305	4.0	1.5
Henan	Kaifeng City	286	3.8	1.4
Hubei	Honghu City	155	2.0	0.8
Shanxi	Yuncheng	306	4.0	1.5
Henan	Xinxiang City	290	3.8	1.4
Anhui	Bozhou City	152	2.0	0.7
Anhui	Huainan City	299	4.0	1.5
Henan	Pingdingshan City	306	4.0	1.5
Henan	Huaxian Country	154	2.0	0.8
Hubei	Xiangfan City	300	4.0	1.5
Shanxi	Fenyang	150	2.0	0.7
Hubei	Jingzhou City	301	4.0	1.5
Hubei	Xishui	141	1.9	0.7
Shanxi	Changzhi City	307	4.1	1.5
Shanxi	Xing County	160	2.1	0.8
Shanxi	Datong	261	3.5	1.3
Henan	Gushi County	146	1.9	0.7
Hubei	Xianning City	151	2.0	0.7
Henan	Xiangcheng County	149	2.0	0.7
Total		**4,803**	**63.5**	**23.3**
West				
Sichuan	Nanchong City	269	4.8	1.3
Yunnan	Xuanwei	145	2.6	0.7
Sichuan	Guangyuan	291	5.2	1.4
Sichuan	Emeishan	137	2.5	0.7
Yunnan	Gejiu	262	4.7	1.3
Gansu	Anxi	300	5.4	1.5
Sichuan	Luzhou	279	5.0	1.4
Sichuan	Neijiang City	141	2.5	0.7
Yunnan	Dali	304	5.5	1.5
Gansu	Pingliang	298	5.3	1.4
Yunnan	Ning'er Hani and Yi Autonomous County	136	2.4	0.7
Yunnan	Anning	258	4.6	1.3
Yunnan	Baoshan City	274	4.9	1.3
Yunnan	Yulong Naxi Autonomous County	175	3.1	0.9
Total		**3,269**	**58.6**	**15.82**

Source: Compiled by Author using CHIP data.

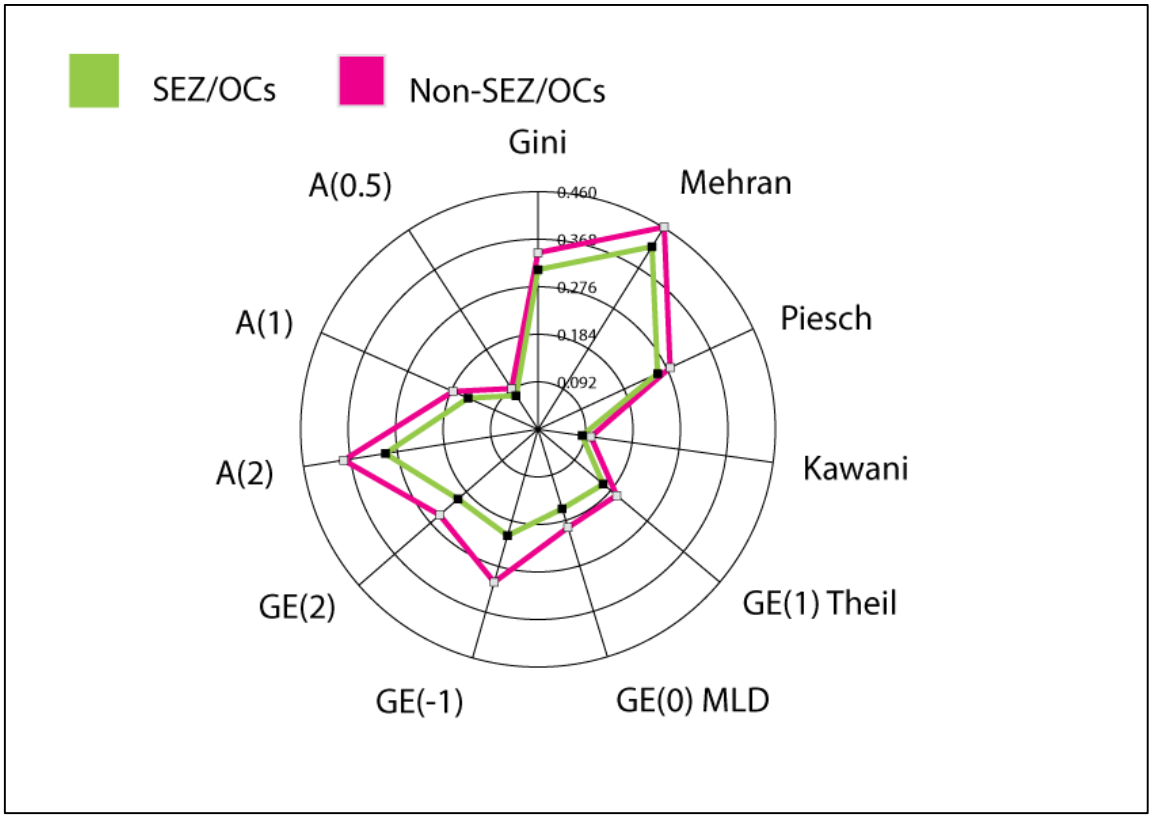
Figure A1.1 Cities with preferential policies in CHIP 2002

Source: Created by Author (2014).

Figure A1.1 shows the cities with preferential policies highlighted in yellow. There are about four SEZ/OCs in each region (six in the Center) and about one per province. (two in Hubei, Anhui and Guangdong)

Appendix 2: Inequality Measurements

Figure A2.1 Income inequality measures for CHIP 2002



Source: Author (2014).

Figure A2.1 shows that income inequality is lower in cities with preferential policies and autonomy compared to cities without preferential policies across all 11 inequality measures used. The largest gaps in the graph appear for the Mehran, A (2), and GE (-1) indices, all of which show sensibility towards the poorest households, further supporting that SEZ/OCs are better for the lowest income groups.

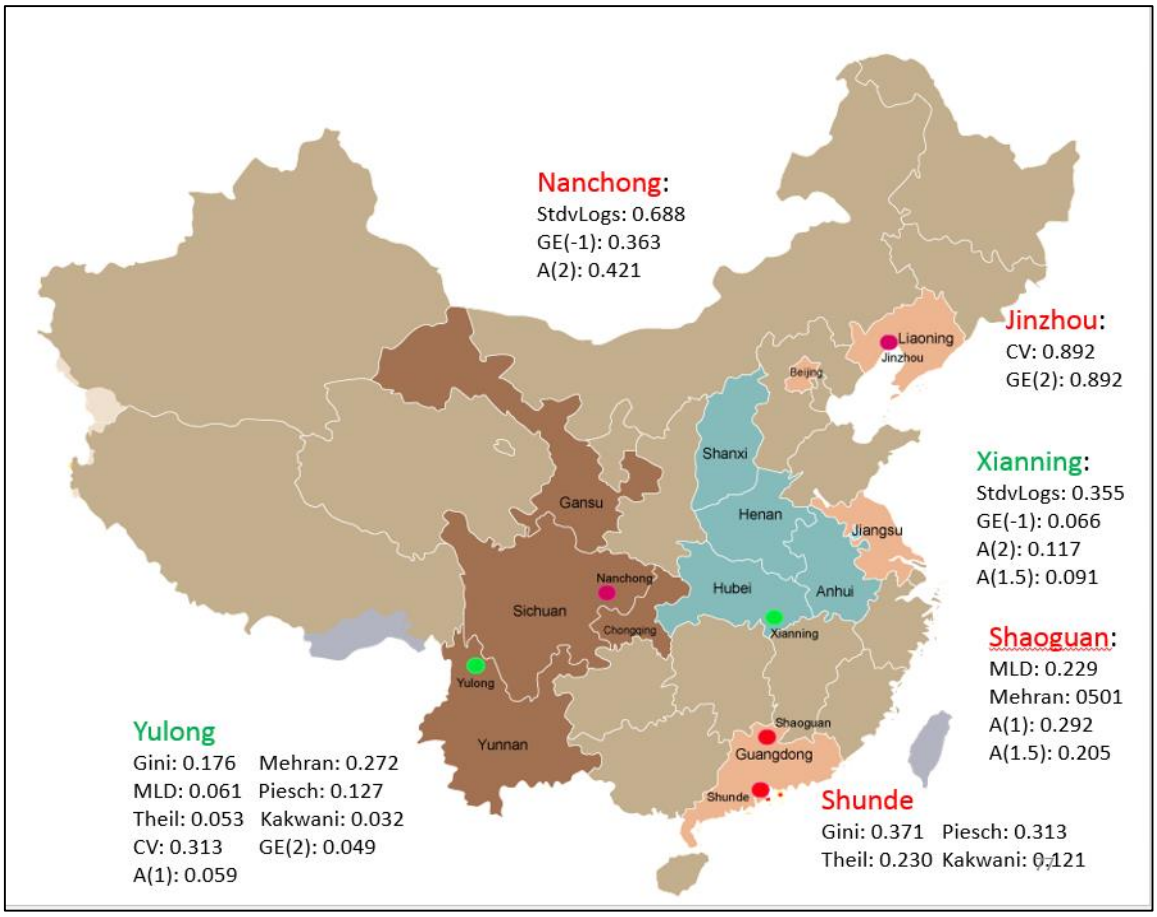
Table A2.1: Income inequality measures for CHIP 2002

	Open Cities	Non-Open Cities
Gini	0.309	0.342
Mehran	0.417	0.462
Piesch	0.256	0.282
Kakwani	0.086	0.103
GE(1) Theil	0.165	0.201
GE(0) MLD	0.161	0.199
GE(-1)	0.214	0.308
GE(2)	0.205	0.253
A(2)	0.300	0.381
A(1)	0.148	0.180
A(0.5)	0.078	0.094

Source: Author (2014).

Table A2.1 shows the income inequality measures used to construct the radar graph in Figure A2.1. All the inequality measures presented in this table indicate that inequality is higher in cities without preferential policies than in cities that have preferential policies and autonomy.

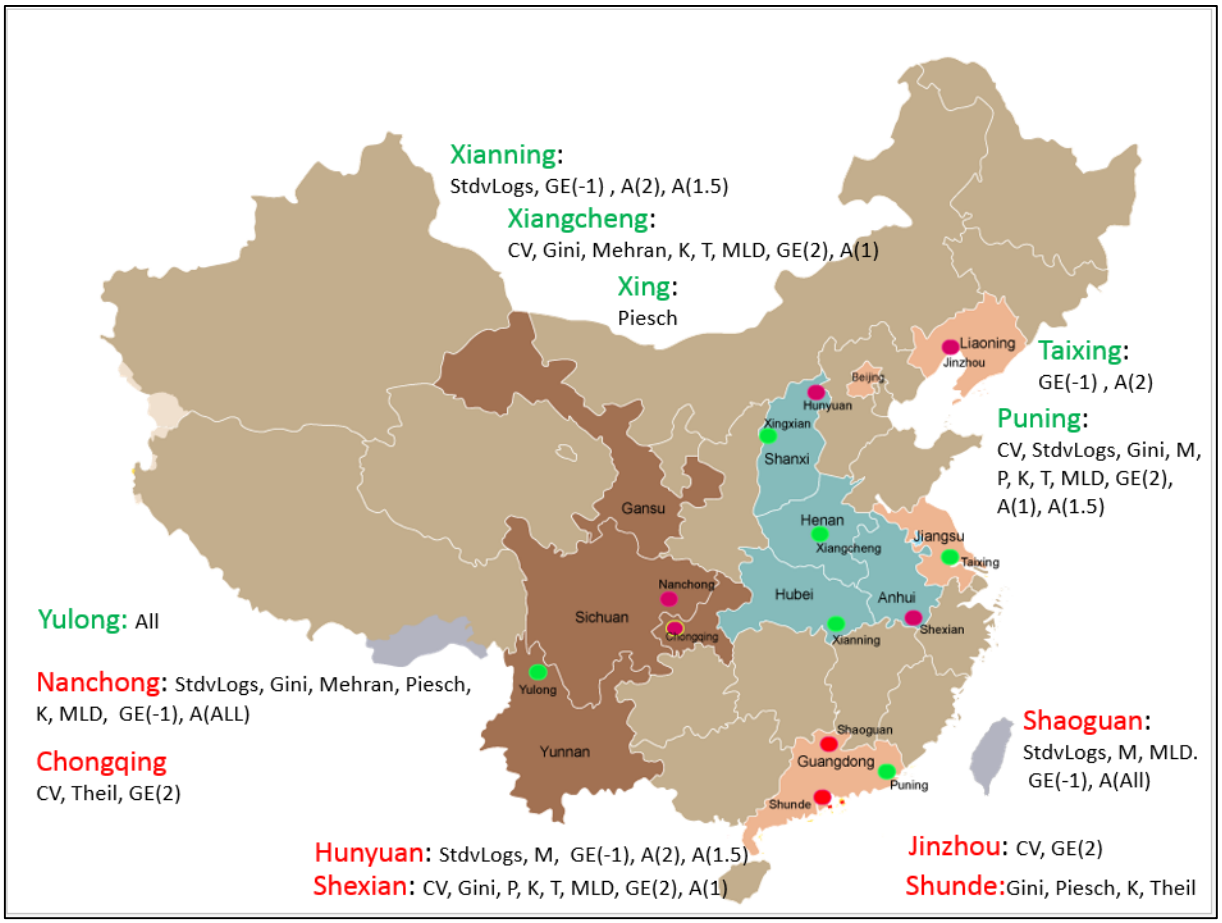
Figure A2.2: Lowest and highest inequality measures of cities



Source: Author (2014).

Figure A2.2 shows the cities with the highest and lowest inequality measures out of a total of 13 measures used. While Yulong seems to be the city with the lowest inequality by most measures, Xianning appears to have the lowest pro-poor inequality by some measures [A(2) and GE(-1)]. With regard to the upper bounds of inequality, Shunde, Shaoguan, Jinzhou, and Nanchong appear to have the highest inequality by different measures.

Figure A2.3: Lowest and highest inequality measures of cities by region



Source: Author (2014).

Figure A2.3 shows the cities which have the lowest and highest inequality measures in each region. In the West, Yulong is the lowest, while Nanchong and Chongqing have the highest inequality. In the Center, Xianning, Xiangcheng, and Xing have the lowest inequality measures, while Hunyuan and Shexian have the highest. In the East, Taixing and Puning have the lowest, while Shaoguan, Jinzhou and Shunde have the highest inequality measures.