LUND UNIVERSITY
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Equal Pay for Equal Work or Unequal Pay for Equal Work?

-Investigating the economic transition of China and the impact on the distribution of income between men and women.

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Abstract

This study investigates how the Chinese transition from a planned economy towards an emerging market economy has affected the income gap between men and women in urban China. Before the market reform, non-market mechanisms allocated labour and wages. Under governmental manifests for equality former strong cultural preference for men were attempted to be eliminated. However, with liberalization of the labour market, firms have gained autonomy to set wages without governmental influence. This has created changes in the income distribution between genders. Through conducting an Oaxaca-Blinder decomposition on data from the Chinese Household Income Project in 1988 and 2002, years that captures China's dramatic shift, the study reveals that both the overall income distribution in China and the income gap between men and women have increased during these fourteen years. The study also shows that during these years the income gap between the genders cannot be explained by differences in characteristics, but rather due to an increase in unexplained differences that can be caused by pure preference discrimination of women on the labour market.

Keywords: *China, labour market, gender, wage gap, transition economy, Oaxaca-Blinder*

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1. Introduction

In 1978, the market-oriented reform began in China. This transformation brought varied and substantial changes to the Chinese economy and produced sustained growth and improvements in material welfare. After Deng Xiaoping's South-eastern tour[1] and the Communist Party Congress in 1992, the pace of the reform greatly accelerated and changes started to appear around the country, not least in the wage system. Before the market reform, China was a centrally planned economy in which non-market mechanisms were used to allocate labour and set wages.

In China's pre-reform era, the whole nation followed the same wage system (Meng, 2012). However, after the reform a more market-oriented economic system emerged where employers could freely choose whom to employ and how to set wages. This economic transformation of China leads to many questions regarding the evolvement of the new Chinese labour market. How does the market transition affect the labour market? Did the reforms have any impact on the differences between men's and women's income?

The aim of this study is to investigate these questions and especially examine how the market reform in China has affected the gender income distribution between men and women. The Chinese historical attitude towards the equal treatment of men and women in the workplace is divergent. In the past, China's Confucian culture includes a strong tendency towards favouring men over women. However, over the last four decades China's government has strongly propagated an ideology of gender equality.

With the market liberalization and the new autonomy as regards to how workers are remunerate, it may be expected that the new freedom of the employers and the cultural preference for male employers may lead to an increased gender wage gap. Nevertheless, according to neo-classical theories, the new established market should thus make it difficult for firms that discriminate to last very long since the newly opened market has increased the competition between the firms. Because of the seemingly many contradictory effects of gender inequalities and market liberalization in a transition economy, examining gender inequalities on the labour market in China therefore becomes of particular interest.

In order to unravel this complex setting, the empirical analysis of this study is based on data from the Chinese Household Income Project Survey (CHIP). The CHIP Survey has been conducted every seventh year since 1988 and estimates the distribution of income in both rural and urban areas of China. Through using the Oaxaca-Blinder decomposition

[1] During the South-eastern tour Deng Xiaoping made various speeches where he stressed the importance of economic openness. This is often seen as the starting point of the market reforms (Zhao, 1993).

measurement of discrimination on the CHIP data, the core question of this study can be answered, namely: *how has the market transition affected the gender income gap in urban China?*

1.1 Previous Research

A number of empirical studies have been made that deals with somewhat related issues to wage inequalities in transition economies. In previous research, scholars have thus used different methods or data in their research and thereby, not surprisingly, presented quite diverse interpretations of women's position on the Chinese labour market.

According to the United Nations, in the majority of the countries in the world women earn 70-90 % of men's income (UN, 2010). In previous studies made on countries moving towards market economy, statistical measurements shows that in for example Russia the wage inequality nearly doubled in the beginning of the liberalization of the market. While women's mean earnings were 79.5 of men's in 1991, it fell to only 63.5 per cent of men's by 1994 (Brainerd, 1998).

In 1993, Meng studied the marketization of China and found that the process had reduced discrimination against women and suggests that further liberalization of the labour market would improve women's economic position in China (Meng, 1993). However, in 1997, Maurer-Fazio, Rawski and Zhang used Chinese statistical yearbooks to analyse the urban labour market between 1988-1994 and showed that there is no evidence of a tendency for the gap between male and female wages to decrease. On the contrary, their forecast predicts an increase in the inequality between the genders (Maurer-Fazio, Rawski, & Zhang, 1997). Another study made by the same authors in 1999 shows that the wage gap in especially urban China has increased, and especially in the sectors that has the largest amount of market influence (Maurer-Fazio, Rawski, & Zhang, 1999).

In a later work by Meng, the author argues that the market reforms have not lead to an increase in the wage discrimination against women. Instead, Meng argues that the socialist period did effectively change the social attitude towards women, which have contributed to a consistent and relatively small gap in comparison with that of many other countries (Meng, 2000).

While there is a great diversity in the analysis of the data in previous research, trustworthy statistical data regarding men and women's wages in China before 1988 have not been available for academic research (Maurer-Fazio, Rawski, & Zhang, 1997). Studies made on the gender-gap in the Chinese labour market during the planned economy are therefore limited. Because of the limited access to Chinese data, many early economic studies have not included

gender-linked wage differentials when examining the gender inequality between Chinese wages of men and women. Instead, gender inequalities have been measured in forms of for example educational opportunities (Bauer, Feng, Riley, & Xiaohua, 1992) or firm-based panel surveys from state owned enterprises (Kidd & Xing, 2001).

In later research many scholars have used data from the Chinese Household Income Project (CHIP). In 2000, Gustafson and Li used the CHIP data from 1988 and 1995 to investigate the impact of the market reform on the urban labour market. Through investigating data from 1988, an early year in the Chinese market reform, and 1995, seven years after the beginning of the reform, their research reached the conclusion that in 1995 the average earnings for women had decreased relative to men. In 1998 the average female earnings were 15.6 % lower than for average men and in 1995 women had an average earning that was 17.5 % less than men. Their paper also showed that an increasing part of the average income-gap could not be explained by difference in the observed variables, but rather through an increase in pure preference discrimination (Gustafsson & Li, 2000).

Bishop et al. (2005) conducts a similar study where they investigate how urban Chinese women have fared in the transition from planned economy to market economy using the CHIP data. Through conducting an equation based on earning and a quantile regression on the same years as Gustafson and Li, they also find that the earning gap in China has increased (Bishop, Lou, & Wang, 2005).

In the most recent study, Magnani and Zhu (2012) use the CHIP data from 2002 to analyse the gender wage differentials among rural-urban migrants. Through using Oaxaca-Blinder composition on the data, their result show that female migrant workers are the ones who are the most disadvantaged in the transitional economy of China. While the research is current, the authors do not try explain the development of gender wage differentials over time through comparing 2002 with the data from 1988 and 1995, but rather which endowment effects that can explain the differences in wage between urban and rural workers and between men and women (Magnani & Zhu, 2012).

1.2 Aim, General Method and Disposition

The aim of this study is to further develop the research of Gustafson and Li with an extended inclusion of the CHIP data from 2002 and thereby analyse the impact of increased market influence on the gender wage gap. Comparing the years of 1988 with 2002 will contribute to a more complete understanding of what effects the market reforms have had on the gender wage gap. 1988 is an early year of the reform process and can thereby capture the effects of the political situation on the labour market in 1988, while 2002 measures the circumstances fourteen years later, when China has become more market-coordinated. More specifically, the purpose of the thesis is:

- To evaluate how the market transition in China has affected the income gap between men and women.

First, the differences in the overall income gap will be estimated using the gini-coefficient. Then income functions of the annual log income of 1988 and 2002 will be conducted. Thirdly, the Oaxaca-Blinder decomposition will be used on these estimates to measure the discrimination of income between men and women. Using the Oaxaca- Blinder decomposition is a standard technique for analysing differences in the average earnings gap between two groups such as men and women (Oaxaca, 1973; Blinder, 1973).

The remainder of the thesis is structured as follows: Section two will provide an historical background of the situation of China's women and the development of the Chinese wage structure. In the third part, theories on labour market discrimination and transitional economics is presented to serve as a theoretical framework for the hypothesis of the study. In part four a thorough explanation of the Oaxaca-decomposition measurement of discrimination will be presented, which will lead to the empirical analysis in part five. In part six the results of the study will be presented through first presenting an overall inequality measure using the gini-coefficient, then a multiple regression will be conducted on which the decomposition will be conducted upon. The sixth part will end in a discussion regarding the results. Finally the study will end with some concluding remarks in part seven.

2. Historical Background of China's Women and Wages

Traditional beliefs and Confucian thought have subordinated Chinese women to men. The legacy of China's past therefore includes a strong tendency to favour the male gender. This strong cultural preference for boys has been sustained through the marriage system where girls "marry out" and leave their family home, while boys remain in the village making sons more likely to contribute to the household's income (Naughton, 2007).

Under the strong central planning, the government sought it necessary to reduce the fertility rate. To limit the increasing Chinese population, the government in the 1980's implemented the One-child Policy. Under the pressure to limit the total number of births per family, many families made the choice to limit those births to the more highly valued sons, making the relative number of boys per 100 girls in the age 0-4 to around 121 (ibid.). This makes females not only less favourable to men, but also makes them a scarcity.

Under the central planning from 1949 to 1978 the state claimed ownership of labour service and assigned employment for life. The enterprises had to provide housing, health and social security benefits and had to accept any and all workers allocated to them, and could not recruit particularly well-qualified workers to their firms (Jeffries, 2001). The wage system was also not designed to promote efficiency or productivity, but rather to provide egalitarian incomes. During the planned economy, men and women received nearly equal pay regardless of their efforts and performance and it can be seen as if "the egalitarian wage system minimized the wage differences across regions, occupations and genders" (Bishop & Chiou, 2004). There were only two separate wage levels: one for the production workers and one for the office and professional workers (Meng, 2012).

Having a command labour market led to a very high amount of labour-force participation (the proportion of the working-age population actually working) since everyone was expected to work. After leaving school, almost all of the Chinese women and men entered the labour force and the women's amount of working hours has been remarkably similar to those of men (Naughton, 2007).

During the socialist period, the traditionally low status of women in the Chinese societies tried to be turned into an artefact of the past. The Chinese government guaranteed females equal rights and assured equal pay for equal work (Becker, 1971). However, with the advent of the market reforms, wages were decentralized from national to local authorities, allowing employers to diverge from the national wage scale. During the reform, the coastal

regions in China received a higher priority in this economic development with more economic freedom and more financial assistance than the provinces in inland China.

In order to promote efficiency and provide work incentives, the new reforms allowed enterprises to provide workers with bonuses, subsidies and productivity-based wages (Kidd & Xing, 2001). The reduction of governmental involvement thus led to an increase of the freedom of managers to discriminate between workers as regards to income.

Scholars have argued that an important reason why women *generally* earn less than men is that women interrupt their working career for childbirth (Sanandaji, 2013). However, in China this interruption has mostly been short. With the implementation of the One-child policy in the 1980's, the interruption from their working career has been minimized, a circumstance which sets China apart from many other countries (Gustafsson & Li, 2000). While women in China are quite similar to men in performing market work, they are also the main producer of housework. Having a larger household responsibility than most men would thus lead to less effort spent on a career. Gustafsson and Li (2000) argue that this disadvantage may in fact have increased during the process of transformation due to the changes in labour legislation and thereby the increased ability for employers to discriminate among employees (ibid.).

Bearing in mind the strong cultural preference for men and the Chinese transition of the economy, it is of great interest to further try to describe the crude gender income gap and how it has been affected by the transition from plan economy to market economy.

3. Theoretical Framework

To be able to study the development of gender wage differential in a transition economy like the Chinese, classical labour economic theories can contribute to give a thorough explanation of the subject in focus. Since China still is a transforming economy, theories regarding the behaviour and development of transitional economies also provide a useful image of how the state and the firms interact and influence firms on the Chinese market.

3.1 Labour Market Discrimination

The modern economic analysis of discrimination can be traced back to Gary Becker's *The Economics of Discrimination* from 1957[2]. In the theories of discrimination, the concept is often divided between statistical and preference discrimination. Statistical discrimination is based on the assumption that hiring involves uncertainty and that employers will optimize their utility through hiring workers based on group based stereotypes, which do not arise from racial or gender preferences (Phelps, 1972) while preference discrimination occurs when equally skilled workers employed for the same job receive different earnings simply because of the worker's race, gender or other seemingly irrelevant characteristics (Becker, 1971). In economic terms, this means that discrimination arises when participants in the marketplace take into account factors such as gender when making a specific economic exchange as long as such factors are not related to productivity (Borjas, 2010, ss. 365-366).

In economic theory, when workers can choose amongst employers, firms that discriminate some groups by paying less than their marginal revenue products and some favoured groups more than their marginal revenue products, will suffer a cost and can thus not be sustained as the market becomes more competitive (Becker, 1971). More specifically, it is argued that increased competition between firms should eliminate excess profits that give firms the resources to pay different wages to men and women with the same education and skills.

If a competitive employer prefers male workers to female workers, the employer will pay men a wage that is higher than the marginal productivity such that the total cost to the employers is the same for all workers. Men will receive the wage $W_M = W + d$ where d is the value of the employers dislike for hiring women and women will only receive the wage $W_F = W$ (Borjas, 2010, s. 367). This illustrates a wage setting where the sexes have unequal pay for equal work (on the same job). In classical economic theories, if a firm is in a competitive market, the firm has zero profit. If the firm buys discrimination d they will have a negative profit and

[2] First published in 1957. In this paper the 2d ed. from 1971 is used.

eventually go out of business. Since trade liberalization with market economy increases the competition, it should lead to a decrease of the excess profits and eliminate those resources that may be used to create a wedge between men and women's wages (Artecona & Cunningham, 2002).

In the case of China's economic transformation, the application of the theory of labour market discrimination becomes complex. In China, the economic market reform opened up the market and increased the competition between firms. This would then, according to the theories, decrease the ability to preference discriminate among workers since there would be no excess profits to the favoured worker in a competitive market. At the same time, the reforms increased managers' stake in the cost effectiveness of the firm and gave workers a newly founded freedom to both switch and to choose employers (Becker, 1971). Managers' ability to discriminate by decentralizing wage settings to firms thereby also increased. In China, this would mean that the decline of the old socialist influences instead would contribute to a re-emergence of traditional patriarchal values, which makes it more acceptable to preference discriminate women.

This means that in theory the economic reform in China can both have lead to an increase and a decrease of the gender wage gap.

Chi and Li (2008), presents two main reasons for why early studies have seen a rising gender gap differential in a transitional economy, such as the Chinese. Firstly, during the transition period from a strict planned economy towards a more open market economy, the return to workers' characteristics such as educational attainment and employment experience tends to increase. This means that if men and women have different characteristics such as education or work experience, the gender earnings differential may rise as the result of related productivity differences. Secondly, the rising gender earnings differential could also be the result of an escalating discrimination against gender in the labour market, since the employers gain more autonomy in a deregulated economy (Chi & Li, 2008).

3. 2 Transitional Economy

"The transition from planned economy to a market economy involves a complex process of institutional structural and behavioural changes" (Liu, 2003). Essentially, this means that the market changes are a society-wide transformation involving not only interdependent changes in the state policy but also in all the economic institutions. In the transition process of China, state-centred analyses has had a dominant influence to describe this relationship because in the market

reform, state-centred analyses have emphasized the persistent power of the governmental elite coordination, and stressed the persistence of state controls, despite a deepening of market reform (Nee & Matthews, 1996).

During a transition from planned economy to market economy, maintaining employment and providing a social safety net are important factors to contain social stability in the country. Since independent institutions for social safety often are absent in a pre-transforming economy, state-owned enterprises are important and needed to contain their role in providing social welfare. In order to maintain this stability, the state often chooses to slow down the reform of the State-owned enterprises (SOE) and to keep certain number of SOE in order to maintain social stability (Bai, Li, Tao, & Wang, 2001). However, it is often stated that even though the transition to market economy has been gradual, the changes has led to a significant shift in the distribution of income in the formerly planned economies. This increase in inequality is often driven by higher inequality in income distribution following the dismantling of the state sector. During the transition, the state ownership with its compressed wage structure becomes concurred by the emergence of different forms of ownership structures, which introduce a much broader wage distribution than before (Milanovic & Ersado, 2012).

The dismantling of the state monopoly on labour market has lead to a number of different ownership structures of firms. There is a clear distinction between state-ownership and private firms, but in China semi-state- owned firms have had an important role for the economic success of the economy, such as joint ventures, foreign-owned enterprises and township and village enterprises (TVE's) who are public enterprises controlled by the local government (Roland, 2000).

A fundamental component of the transition is also the important change in the allocation of resources that takes place when the central planning system gets replaced by the open market as a system for allocation of resources, from state owned firm structures to public enterprises (ibid). There can be little doubt that the Chinese labour market has become more varied. With the liberalization of the market, some firms have retained the employment practise of the socialist period, while others have adopted an employment structure more in response to market forces and the desire to maximize profits. However, when studying the labour market of a transition economy, one must bear in mind that the structure of different firms and sectors may vary, which could influence the relative size of the income gap between two sets of firms. If women, for example, have less education than men, and the return to education were higher in for example joint venture firms, then the compensation for education in joint venture firms would lead to a larger gender income gap.

In China, the state-owned firms are fully controlled by the government. Other ownership structures of Chinese firms such as collective enterprises are owned by local communities or local governments and joint venture firms consist mostly of offshore investors; it can therefore be expected that in the state-owned enterprises, the employment and wage structure are the least affected by the market. Since private, collective and joint venture firms function in a more competitive market they can be expected to have a more flexible wage structure. The private firms would be able to discriminate more in the firms, since they have a higher degree of autonomy. In the state-owned enterprises, the wage structure is more similar to the wage structure during the planned economy where the state has control over employment and their still consists an egalitarian wage structure. The rule of equal pay for equal work can thus be more implemented and formalised in this state structure than in more private forms.

Becker (1971) argued that higher degree of market competition would decrease the ability of firms to discriminate and it is anticipated that countries that have undergone strong trade liberalization and have a developed market economy would thereby automatically increase in competition between the domestic firms and thus decrease the income gap. The need for firms to generate profit should therefore reduce the ability of different private firm construction to engage in costly discriminatory practices (Becker, 1971).

However, it can be acknowledged that as the country transits from a planned economy to a market economy, producers and firms will pay more accordingly to their individual productivity. Relatively newly formed enterprises in the transforming economy become more likely to be free of the previous behaviour of egalitarian wage structure and more vulnerable to the market. It can therefore be anticipated that it will be more income disparity under a more flexible wage system in the new market economy. With less socialistic influence of the wage distribution, traditional Confucian values can be re-emerged.

Since these theories are contradictive, it is difficult to determine which of these effects that will have had the greatest impact on the income. From these theories, two hypotheses can therefore be constructed. Based on the theories of transitional economy the first hypothesis can assume that:

Hypothesis 1: Economic transition towards market economy will increase the gender income gap.

From the theories of Becker and labour market discrimination, the second hypothesis instead assumes that:

Hypothesis 2: Economic transition towards market economy will decrease the gender income gap.

Through conducting our analysis, the study attempts to answer which of these hypotheses that can explain the development of the labour market in China most accurate.

Previous studies have showed that gender wage differentials are smaller within firms than across firms and that much of the male-female gap for less educated and less experienced workers is due to the crowding of women into low-paying firms (Becker, 1971). This suggests that differences in different employments and sectors can be an important source of gender wage differentials and should not be ignored when analysing differences in gender wage gaps.

4. Method

In this section, a thorough description will be given of the Oaxaca-Blinder decomposition, which will be used as the measurement of discrimination between men and women's income in urban China.

4. 1 The Oaxaca Measurement of Discrimination

The most commonly used way to measure economic discrimination in the labour market is through the Oaxaca-Blinder decomposition after Oaxaca (1973) and Blinder (1973). As mentioned earlier, wage discrimination against women can be said to exist whenever the relative wage of men exceeds the relative wage that would have prevailed if men and women were paid according to the same criteria. According to Oaxaca, discrimination can be formalized through a discrimination coefficient (D).

(1) $$D = \frac{{}^{W_M}/_{W_F} - \left({}^{W_M}/_{W_F}\right)^0}{\left({}^{W_M}/_{W_F}\right)^0}$$

Where ${}^{W_M}/_{W_F}$ is the observed male-female wage ratio and $\left({}^{W_M}/_{W_F}\right)^0$ is the male-female wage ration without discrimination. Using natural logarithms the expression would look as follow:

(2) $$\ln(D+1) = \ln\left({}^{W_M}/_{W_F}\right) - \ln\left({}^{W_M}/_{W_F}\right)^0$$

Since $\left({}^{W_M}/_{W_F}\right)^0$ is unknown, the estimation of D can be set equal to this wage ratio without wage discrimination.

Ordinary least squares estimation (OLS) of a wage equation for any given group of workers provides an estimation of the wage structure that is applicable to that specific group. We can thereby make the important assumption that: if there were no discrimination of gender wages, the wage structure of female would also apply to men and opposite applies (Oaxaca, 1973). The wage equation can then be estimated separately for each gender and has a semi-log functional for where:

(3) $$\ln(W_i) = Z_i'\beta_i + u_i$$

Where

W_i= the (hourly)wage rate
Z_i'= a vector for individual characteristics
β_i= a vector coefficient
u_i= an error/ disturbance term

When the male female wage differential is expressed through the natural logarithms, the formation of the discrimination coefficient shown in (2) and our assumption together implies that the wage differential can be decomposed into the effect of discrimination and the effects of differences in individual characteristics. If we let:

$$D = \frac{\bar{W}_m - \bar{W}_f}{\bar{W}_f}$$

then

(4) $$\ln(D+1) = \ln(\bar{W}_m) - \ln(\bar{W}_f)$$

where $\bar{W}_m$ and $\bar{W}_f$ are the average (hourly) wages for men and women, respectively. From the properties of the OLS estimation, we have that:

(5) $$\ln(\bar{W}_m) = \bar{Z}_m'\hat{\beta}_m$$

(6) $$\ln(\bar{W}_f) = \bar{Z}_f'\hat{\beta}_f$$

where $\bar{Z}_m'$ and $\bar{Z}_f'$ is equal to the vectors of mean values of the regressions for men and women and $\hat{\beta}_m$ and $\hat{\beta}_f$ is equal to the corresponding vectors of estimated coefficients. We can then substitute (5) and (6) into (4) and obtain

(7) $$\ln(D+1) = \bar{Z}_m'\hat{\beta}_m - \bar{Z}_f'\hat{\beta}_f$$

If we then let

(8) $$\Delta\bar{Z}' = \bar{Z}_m' - \bar{Z}_f'$$

(9) $$\Delta\bar{\beta} = \hat{\beta}_f - \hat{\beta}_m$$

and further substitute $\hat{\beta}_m = \hat{\beta}_f - \Delta\bar{\beta}$ in equation (7), the gender wage differential can be written as

(10) $$\ln(D+1) = \Delta\bar{Z}'\hat{\beta}_f - \bar{Z}'_m\Delta\bar{\beta}$$

From equation (2) and the assumption that the female wage structure can apply to both men and women in a non-discriminating market, it can be further shown that

(11) $$\ln\left(\frac{\widehat{W_m}}{\widehat{W_f}}\right)^0 = \Delta\bar{Z}'\hat{\beta}_f$$

(12) $$\ln\widehat{(D+1)} - \bar{Z}'_m\Delta\bar{\beta}$$

The expressions in (11) and (12) represents the decomposition of the wage differential into the estimated effects of differences in individual characteristics and the estimated effects of discrimination[3]. By using the decomposition measurement, we can analyse the raw wage differential that is due to differences in characteristics between the two groups such as year of education, age, labour market experience, region, and a portion that remains unexplained and that can be caused by discrimination.

In several previous studies, the Oaxaca decomposition is further developed through combining the theories of Blinder (1973). Instead of using the equation above, the discrimination effects on the wage are explained through the following decomposition:

(13) $$\overline{lnW_m} - \overline{lnW_f} = \overline{(Z_m} - \overline{Z_f})\,\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}$$

or

(14) $$\overline{lnW_m} - \overline{lnW_f} = \overline{(Z_m} - \overline{Z_f})\,\hat{\beta}_f + (\hat{\beta}_m - \hat{\beta}_f)\overline{Z_m}$$

In this equation, Z is the same vector that captures the different characteristics of the employee and $\hat{\beta}$ is the vector for the estimated coefficients. On the right-hand side, the first term is the earnings differential explained by the different characteristics of the workers while the other term captures the discrimination, since it represents different returns for the same characteristics. The measurement of Oaxaca and Blinder contributes thereby to single out unequal treatment of females before the earnings-determining process (the differences in different variables) from unequal treatment in the earnings-determining process (the differences in coefficient). The latter is often referred to as *earnings discrimination,* which differs from the wider concept of gender discrimination since it includes different opportunities such as education or occupational skills.

[3] On the basis of equation 2 and the assumtion that the wage structure for men would apply to both men and women in the absence of discrimination, equation (11) and (12) $\Delta\bar{Z}'\hat{\beta}_f$ can be changed to $\Delta\bar{Z}'\hat{\beta}_m$ and $-\bar{Z}'_m\Delta\bar{\beta}$ can be substituted to $-\bar{Z}'_f\Delta\bar{\beta}$

One fractal problem of using the measurement is thus that one can vindicate that there will never exist two identical occupations. This means that all of the crude gender wage gap must be attributed to differences in variables since it is not possible to correctly measure wage discrimination. The validity of the Oaxaca-Blinder decomposition measurement also depends largely on whether we have controlled for all the aspects in which the skills of the two groups differ (Borjas, 2010). If there are some characteristics that have any effects on the wage but are left out of the regression model, the measurement of labour market discrimination will be incorrect. Using Oaxaca as a measurement of discrimination, it must be remembered that unobserved variables such as effort and motivation can have an effect on the wage gap and thus show a larger degree of discrimination than what is actually true. It is therefore important to have a data set that has variables that provides important information about the workers and their conditions.

5. Empirical Analysis

There are different variables explaining the gender income gap. In this section, the data and the variables employed in the estimated model will be presented and how the variables are measured and constructed. This chapter will also provide some descriptive statistics comparing the chosen variables in the model.

5. 2 Data

In this paper an econometric investigation is employed in which data from the Chinese Household Income Project (CHIP) surveys from 1988 and 2002 are used. The surveys have been conducted by the Institute of Economics, Chinese Academy of Social Science. For 1988, the survey covers ten provinces including: Anhui, Beijing, Guangdong, Gansu, Henan, Hubei, Jiangsu, Liaoning, Shanxi, and Yunnan. In 2002, Sichuan was included to the ten provinces (Chinese Household Income Project Series, 2013).

The two surveys are designed in similar ways, and although the data from these surveys are comparable, however, they are not identical instruments. In the later survey, some extended questions have been included. The data collection consists of two samples of the urban and rural population on individual and household level. In this study, data from urban parts of the provinces will be used since the rural survey is not comparable with the urban survey, and over time. The two samples are large as there are 9440 men and 8610 women who are employed or self employed in the first survey and 5699 men and 4589 women in the second survey. Any observation with missing information on variables for this analysis is dropped.

The study is restricted to only analyse the income from people who actually work. This means that people who are unemployed, retired or are full-time students are not included. Not including retired and full-time student will hopefully, not affect the result severely, since their income are either relatively small or non existing and the pension or subsidies is often fairly equally distributed between men and women. However, there is always a problem not including unemployed people when measuring discrimination between genders, since a form of discrimination in the labour market is to not be employed because of the gender. However, since this study measures income differences it is of importance that the person receive an income from an employment, thus this study does not include unemployed persons.

A severe limitation with the data is that migrant workers from rural areas that work in urban cities are not included in the survey, because they are not registered in the urban *Huku system* (a unique household registration system), which were of requirement for participation.

5. 3 Variables

The analysis proceeds with a presentation of the descriptive statistics of the variables. The descriptive statistics in table 1 is divided by gender and by the years 1988 and 2002, allowing for comparisons over time. The choices of the variables are based in the theoretical section and from relevant academic literature and research regarding operational measures.

5.3.1 Descriptive Statistics

The aging of the labour force is seen in table 1. The participation rates slightly decreases over time for both the men and the women. In 1988, circa 40 and 50 % of the labour force was under 35 years old. In 2002 the labour force younger than 35 years were only 26 and 35 % of the entire labour force. Instead, the proportions of people aged between 36-55 have increased in 2002. This can de due to the fact that educational level of the work force has increased as well. Because of earlier school-leaving age and earlier retirement, the female labour force is younger than the male labour force.

In China the literacy rates has been quite high. During the socialist period, literacy and basic education were seen as "basic needs"; however, when China emerged from the Cultural Revolution, higher education was very unusual (Naughton, 2007). During the 14 years of market reforms, the educational attainment has been increasing very rapidly, particularly in higher education, as can be seen in table 1. Men have dominated in the higher education level; however, the gap has thus decreased during the years.

While almost 35-40 % of the male labour force are members of the communist party, the member rate for women are much lower. In China, the ethnic minorities often live in the rural parts (Gustafsson & Li, 2000). It is therefore not incongruous that only 4 % of the labour force in urban China belongs to a minority.

When it comes to type of employment and in which sector, men are more dominant in sectors such as transport, manufacturing and government, while women are more dominant in social services and in the sector "Trade, restaurant, marketing, Real Estate". The distribution between men and women in the types of employment are quite equal, the only exception is in the government where men are substantially dominant and in the "office" section where women are more dominant.

Regarding the ownership structure of the employment, it may look like the employment at state owned enterprises has increased during the years (and so it might). It should thus be noted that this might be due to the fact that in the survey of 2002, the answer option

"other publicly owned" is not available, which might have caused people who work in governmentally run enterprise to answer "State-owned". It should also be noted that in this survey question in 2002, almost 65 % of the answers are missing or "incorrect answered". Regarding the provinces, the distribution of the participants seems fairly equally distributed among the different provinces. Data from Sichuan was not available in 1988.

Table 1: Descriptive Statistics of Main Variables by Gender (%)

	1988		2002	
Variables	Men	Women	Men	Women
Age				
Aged 0-15	0.36	0.49	0.09	0.13
Aged 16-25	15.22	17.66	5.88	8.35
Aged 26-35	25.66	32.36	20.04	26.15
Aged 36-45	28.74	32.30	34.67	41.25
Aged 46-55	23.23	16.07	33.37	22.55
Aged 56-65	6.57	0.95	5.63	1.42
Aged 65->	0.21	0.17	0.32	0.15
	100	100	100	100
Education level				
Higher Education	17.09	8.21	35.22	30.38
Professional School	10.80	11.26	10.69	14.88
Upper Middle School	24.24	25.55	26.48	29.90
Lower Middle School	37.29	40.10	24.74	21.90
Primary School	9.96	13.17	2.74	2.61
Less than 3 years or no education	0.61	1.71	0.14	0.33
	100	100	100	100
Party membership				
Party member	34.41	11.84	39.14	26.42
Non-party member	65.59	88.16	60.86	73.58
	100	100	100	100
Minority				
National minority	3.87	3.67	4.00	4.14
	96.13	96.33	96.00	95.86

Non-national minority	100	100	100	100
Sector				
Farm,fishing, forestry, mining, mineral	5.22	2.96	3.39	2.04
Manufacturing	41.14	44.88	26.50	23.42
Geological prospecting, Constructing	4.97	3.62	4.98	3.01
Transport, post, tele, electricity, communi	8.34	5.04	13.87	7.75
Trade, restaurant, marketing, Real Estate	13.03	19.28	11.34	16.38
Social-, personal- and counselling services	0.78	1.49	7.26	14.19
Health, Sports, Social Welfare	3.44	5.88	3.87	6.71
Education, culture, art	6.74	7.91	8.41	9.83
Scientific Research & Technical Services	2.51	1.58	2.04	1.39
Finance & Insurance	1.56	1.53	2.43	3.06
Party & government, or social organs	11.61	5.03	13.66	10.01
Other	0.66	0.80	2.25	2.21
	100	100	100	100
Type of Employment				
Private own, self emp	1.35	1.29	4.89	4.49
Professional or Tech	15.69	15.95	20.15	22.55
Government	7.57	1.48	15.04	0.48
Office- worker or manager	28.57	21.58	17.75	23.52
Labor,skilled, unskilled	46.81	59.70	40.15	41.91
Other	-----	-----	2.02	2.70
	100	100	100	100
Ownership				
State-owned	43.64	33.96	95.45	93.78
Other Publicly-owned	40.43	37.09	------	------
Collective	14.41	26.79	0.78	1.74
Private or Individual	0.86	1.08	2.27	2.42
Foreign/sino-forei. JV	0.03	0.41	0.12	0.29
Shareholding company	-----	-----	0.05	0.88
	0.33	0.68	0.83	0.90

Other	100	100	100	100
Province				
Beijing	5.14	4.60	7.91	8.59
Shanxi	11.25	10.41	9.02	8.15
Liaoning	10.05	10.68	11.25	9.96
Jiangsu	12.88	12.61	9.95	9.48
Anhui	9.86	9.91	7.00	6.25
Henan	11.67	11.82	9.37	9.59
Hubei	10.66	11.02	10.14	10.44
Guangdong	11.85	11.92	8.90	9.83
Sichuan	------	------	12.41	12.51
Yunnan	9.85	10.57	8.26	9.50
Gansu	6.80	6.49	5.79	5.71
	100	100	100	100

Source: CHIP, Urban Household Income Survey 1988 and 2002

5.3.2 Dependent Variable

The dependent variable is the logged sum of annual earnings received in all forms from current employment (in year 1988 and 2002). This annual earning includes basic wages, bonuses and subsidies. In China, the income does not solely consist of the regular monthly wage, but from bonuses and other forms of income; therefore this study includes both subsidies and bonuses. The dependent variable is divided into income of men and of women in order to compare the differences of income between the genders. In the model, the participation ratio between men and women are quite equal. In 1988, 48 % of the participants were women and in 2002, 45 % of the participants were women.

5.3.3 Control Variables

In order to answer the main research question and test the hypothesis regarding how the market-oriented reforms have affected the income distribution between men and women, some control variables are employed to capture the different endowment effects and regional effects and eventually evade unrelated influences on the income distribution.

The first variable observes the age of the workers. The age of the employee serves to isolate if there is any difference in wage depending on the age. It could be argued that instead of the age of the workers, the study should include how many years the worker have been employed in order to capture the increasing experience that an additional year of employment

can generate. However, the years of employment could differ from men and women, since women statistically have a shorter work career than men. Since they are strongly correlated, this study and previous researches (Gustafsson & Li, 2000) includes only the age.[4]

The other control variables are: the education level of the workers, if the worker is a member of the Communist party, if the worker belongs to a minority, which type of employment and in which sector the participant works in, ownership of the firm and the geographical residence of the employee. It is anticipated that education is positively related to higher income as well as party membership. Party membership may be a proxy for unobserved human capital such as experience, education and valuable contacts. Being a minority is expected to be negatively correlated to earnings since Chinese minorities have historically been negatively discriminated and can thus be expected to still receive some wage based discrimination. The variables measuring different sectors and type of employment are included in the model to isolate for differences in wage structure between different types of employment and in which sector the person works in.

There are also two variables measuring the ownership of the employment and the province in which the employee has his/her residence. Changes in ownership of different firms and geographical location can be supposed to have affected the earnings of different workers differently. When new sectors and new ownership structures appear in the transition economy, they can attract new workers by paying more. The reform process has also had a clear region dimension. The economic changes first took place in the South-Eastern region (after the South-Eastern tour by Deng Xiaoping) and they were the regions that first opened to foreign investments. It can therefor be assumed that Eastern provinces should be more market liberalized and have a higher degree of market competition and should thus pay a higher wage than many inland regions. In order to see if there are any regional differences, the provinces will be divided into regions. A further presentation of the measurement of the variables is shown in table 7 in appendix 1.

5. 4 Model Specification

In order to answer the main research question, all the variables described in the previous section are inserted in a multiple linear regression model in order to estimate the independent variables' affect on the wage distribution. As mentioned before in chapter 4, the estimation method is an Ordinary Least Squares (OLS), which provides an estimation of the income structure.

[4] When including the experience variable (years of employment) in the OLS, there were not a great increase in the R^2 and the result was not significant, therefore the experience variable is not included in the model.

The income equation can be estimated as in equation 5 and 6 ($\ln(\overline{W}_i) = Z_i'\beta_i + \varepsilon_i$) where Z_i' equals the vector of mean values of the regressions for men and women and β_i equals the corresponding vectors of estimated coefficient. When incorporating the variables, the equation looks as follows for each gender:

$$Ln\_Income_{MALE} = \alpha + \beta_2 Age_i + \beta_3 Education_i + \beta_4 Party_i + \beta_5 Minority_i + \beta_6 Sector_i + \beta_7 Type_i + \beta_8 Ownership_i + \beta_9 Region_i + \varepsilon_i \quad (13)$$

$$Ln\_Income_{FEMALE} = \alpha + \beta_2 Age_i + \beta_3 Education_i + \beta_4 Party_i + \beta_5 Minority_i + \beta_6 Sector_i + \beta_7 Type_i + \beta_8 Ownership_i + \beta_9 Region_i + \varepsilon_i \quad (14)$$

The parameters of the model are estimated through and OLS regression analysis where the error terms ε_i have a normal distribution and the variances are homogenous. A weakness of OLS is that the method cannot uncover the effects of the independent- and control variables on the "shape" of the distribution. The rate of return to an endowment effect such as education might not be equal at all wage levels, for example (Bishop, Lou, & Wang, 2005).

There is always a risk of the model being endogenous. When having endogeneity some of the control variables can be correlated with the equation's error term through having omitted variables in the model, or having measurement errors. There can also be a reverse causality where some of the variables can be affected by the dependent variable. When having endogeneity in the regression, the OLS becomes both biased and inconsistent and is not an appropriate estimator (Verbeek, 2012). The CHIP data that is used in this study may have measurement errors, however since this data is the most trustworthy and available data of Chinese labour market there is, it is difficult to solve this kind of problem. Either the possible errors have to be accepted or we have to conduct a data collection of our own in order to limit the measurement errors.

To be able to use the OLS, the remedy for solving the problem of omitted variables is to obtain a proxy variable that is correlated to the omitted variable. In this study, ability is not included in the model for explaining income, but will hopefully be measured through the other included variables such as education or age. Through choosing the right variables, recommended from previous researches and theories, the risk of having endogeneity in the regression is thus minimized. However, there is always a problem of adding to many control variables in the regression, which may cause bad control problem (Angrist & Jörn-Steffen, 2009).

There might also be a reverse causality in the regression. It can be assumed that having a high income can be a motive to move to wealthier region, rather than income having a positive impact on the income. However, this is mostly controlled for in this study since the

government has through the implementation of the Houku system made it difficult for domestic immigration and thus controlled the movements of the population. This control of the variables applies to most of the variables and makes the risk of having reverse causality relatively small, compared to many other countries.

6. Result

In this part the result will be presented. Firstly, the study will present how the overall income inequality has changed over the fourteen-years-period. After creating an estimated model in 5.4, the second step will be to conduct an income estimation by using the annual logarithmic income as the left hand-side variables and the explanatory variables, for men and women separately, on the right hand-side. The Oaxaca-Blinder decomposition will then be conducted on the OLS to determine the gender income gap.

6. 1 Income Changes

In table 2, the descriptive statistics of the mean annual income in 1988 and 2002 is presented. The mean annual income for 2002 is adjusted to 1988's prices through CPI (World Bank, 2013) and the actual received income is presented in the parentheses. CPI is constructed using the prices of a sample of representative goods whose prices are collected periodically, and it can thus be argued that it is not a suitable measure for China since the goods have most certainly changed significantly during the years of transformation. However, as can be seen in the table, the income has increased massively during these fourteen years, which makes it more suitable to control for some form of inflation in order to analyse the true income increase between the years.

In table 2, it is shown that between 1988 and 2002 the average annual income for men have increased by 118.8% and for women the average annual income have increased by 85.6 % (in real terms). In 1988 the average income for women where 87.96% of the male income, while in 2002 the income had decreased to only 74.60 % of the male income.

According to the International Labour Organization (ILO) the globally average monthly income for women are 70 % of men's monthly income (ILO, 2013). This means that even though the income differences between men and women have increased in China, the differences are still bellow the globally average for year 2013.

In order to investigate the overall inequality, the gini-coefficient is applied. The gini-coefficient is a widely used measurement to analyse inequality in the distribution of income. Through decomposing the gini-coefficient by the different income sources, it can be calculated how the impact of a marginal change in a particular income source have on inequality (Lerman & Yitzhaki, 1985) (Stark, Taylor, & Yitzhaki, 1986). Lerman and Yitzhaki (1985) present a gini-coefficient for total income as follow:

$$Gini - Coefficient = \sum_{k=1}^{K} S_k G_k R_k$$

Where $S_k$is the share of the income sources, G_k is how unequal distributed the income sources are and R_k shows how the income sources and the distribution of total income are correlated. In table 2 the inequality measured by the gini-coefficient increased from 19.39% to 35.50 % for men and from 19.89 % to 38.68% for women. Table 2 also shows that the basic wage has taken a greater share of the total income in 2002 than in 1988, while bonuses and subsidies has in 2002 taken a less share of the total income.

It can therefore be concluded that with the increase in economic growth, the differences in income between Chinese citizens has become consequently wider during the fourteen years and that the overall income disparity has significantly affected the Chinese women greater than men.

Table 2: Descriptive Statistics of Mean Income & Inequality by Gender

	1988		2002	
	Men	Women	Men	Women
Total annual income (yuan)	2101	1848	4598 (12205)	3430 (9105)
Basic Wage	1378	1205	4027 (10690)	3057 (8115)
Bonus	401	356	331 (879)	216 (573)
Subsidies	322	287	240 (636)	157 (417)
(G_k) Gini coefficient (%)				
Total income	19.39	19.89	35.50	38.68
Basic Wage	18.30	18.61	34.62	37.14
Bonus	45.84	44.97	87.23	90.74
Subsidies	27.58	28.10	90.48	92.65
(S_k) Share of Income Components (%)				
Total income	100	100	100	100
Basic Wage	65.59	65.21	87.59	89.13
Bonus	19.09	19.26	7.20	6.29
Subsidies	15.32	15.53	5.21	4.58

Source: CHIP, Urban Household Income Survey 1988 and 2002
Notes: 2002's basic wages, bonuses and subsidies are adjusted in 1988's

6. 2 Income Function

In table 3 the estimated income function for men and women are reported in the years 1988 and 2002. The assumption regarding homogenous variances in the model is tested through a Lagrange Multiplier, namely the Breusch-Pagan heteroskedasticity test. To correct for any detected heteroskedasticity, the study uses White's robust standard errors. A visual test is conducted to further observe if the residuals were normally distributed, this can be seen in the histograms in appendix 3. The variables in the regressions are also tested for multicollinearity using the variance inflation factor (VIF) and also test for nonlinearity using the RESET-test.

In table 3 there are many results worthy of attention. Firstly, as can be seen in the table, the income is strongly related to the age in China. In 1988 the age effect increased the male equations up to the age class of 56-65 after which it flattened out. In 2002, the age effect for those over 55 years was smaller for men, which may reflect productivity-considerations being more important than previously when determining income for the older employees. However, in 2002 the age effect for the female workers over 65 has increased. This can be due to the fact that in the planned economy, workers received pension from the state-owned enterprises when aging. Due to the liberalization, many workers have been forced to work longer due to the lack of a working pension system in private firms in 2002; this has especially affected the older Chinese women.

The effects of education is very small in 1988 and most of the effects are not significant. The most substantial change is thus that during the fourteen years, higher levels of education have increased its positive impact on the income. Having a higher education to upper middle school education has a strong positive effect on education, while having only a primary- or non-education have a negative impact on the income compared to lower middle school. This increase in the educational effect on income may be caused by the rapid economic growth in China that has lead to a demand for more skilled labour since firms are able to invest more in educational development and resources. It may also be the case that persons who enter the labour force have a much higher education than those leaving the labour force, due to retirement, which may impact the educational return to income. This is a most likely explanation, since during the culture revolution in 1966-1976 big parts of the higher education system were abolished and large parts of the older population has no higher education because of this (NE, 2013).

For women, higher level of education has in particular had a great positive impact on the income, than for men. However, low level of education has a greater negative impact on income for women than for men. This difference in the educational effect on income between

the genders can be caused by that fact that low-educated men are often able to work in occupations where educational abilities are not a necessity, but where they still receive a decent wage while women are not culturally accepted in these occupations and rather has to work at home or engage in a similarly underpaid occupation.

It is not solely education that has increased its positive impact on income, working in the state sector has still a strong positive effect on the income and working in a private or in an individual company has also become strongly positive correlated with an increase in the income.

Being a member of the Chinese Communist party has a positive effect on the income, with a high significance. The effect is however not very high. The interpretation of this result is of difficulties since membership in the Communist party can both reflect unobserved human capital such as experience that they gain from internal education, meetings, but it can also be a proxy for "important and valuable contacts" and thereby rather reflect corruptive structures on the labour market.

Being a minority had a negative impact on the income in 1988. In 2002, being a minority had a negative impact for men and a positive impact on income for women; these effects are thus not significant.

In 1988 the effects on the income from working in different sectors were not very strong; in 2002 the effects from some of the sectors where thus much stronger. The sectors "Transport and Communication" and "Scientific Research" had both a positive impact on the income, while the sectors "Trade and Restaurant" and "Social Services" had a negative effect on the income. The overall effects of the sectors are therefore not as straightforward to interpret.

When it comes to the type of employment, the overall effects are also difficult to interpret. In 1988 and 2002, unskilled and skilled labourer has had a negative effect on income, while "government" and "professional or technical" has a positive impact on income, especially in 2002. "Private owned or self employed" effects on the income are thus difficult to interpret between the years.

The table also shows that ownership of the firm has an impact on the income. Private or individual ownership has had a strong negative impact on the income in 1988, while in 2002 private or individual ownership structures had a significant positive impact on income. State-owned enterprises have in both 1988 and 2002 had a positive effect on income. However, in 2002 the answer "other publicly-owned" was not included in the survey, which may have increased the answers for state-owned or "other". What may be surprising is that foreign, sino-foreign and joint ventures had a more significant impact on income in 1988 than in 2002. In previous studies, data shows that this category had a positive impact on income in 1995 (Gustafsson & Li, 2000). Why this category has not had as great impact on the income in 2002 as

in 1988 can be due to the fact that new forms of domestic ownership structures have occurred and that more and more people have the ability to start their own company and thereby increase their income.

A distinction from table 2 is that the provinces have been divided into three regions: East, Central and West[5] to better resolve if there are any differences in income between the regions. As can be seen in table 3 since, the Chinese reforms have had quite a regional dimension where the Eastern regions in China early entered the economic market reforms. This has made the economic growth faster in these provinces and it has seemingly also contributed to a positive impact on the income in the Eastern regions compared to Western regions while living and working in the Central region has a strong negative impact on the income compared to Western regions.

Table 3. Coefficient of Income Functions of the Workers in 1988 & 2002

	1988		2002	
Variables	Men	Women	Men	Women
Intercept	7.17***	7.09***	8.32***	8.41***
	(0.41)	(0.04)	(0.13)	(0.11)
Age				
Aged 0-15	0.03	0.38***	-0.022	0.77**
	(0.12)	(0.08)	(0.20)	(0.33)
Aged 16-25	----	----	----	----
Aged 26-35	0.32***	0.26***	0.35***	0.27***
	(0.23)	(0.02)	(0.05)	(0.04)
Aged 36-45	0.43***	0.36***	0.49***	0.40***
	(0.23)	(0.02)	(0.04)	(0.04)
Aged 46-55	0.52***	0.40***	0.54***	0.51***
	(0.02)	(0.03)	(0.05)	(0.04)
Aged 56-65	0.53***	0.50***	0.53***	0.43***
	(0.03)	(0.12)	(0.05)	(0.08)
Aged 65->	0.29***	0.35***	0.47***	0.71*
	(0.04)	(0.06)	(0.10)	(0.46)
Education level				
Higher education	0.06***	0.05**	0.31***	0.38***
	(0.02)	(0.23)	(0.03)	(0.03)
Professional School	0.01	0.04**	0.13***	0.27***
	(0.02)	(0.02)	(0.03)	(0.03)

[5] A further explanation of the division of the provinces can be seen in appendix 2.

Upper Middle School	0.01	0.02	0.16***	0.17***
	(0.01)	(0.02)	(0.02)	(0.03)
Lower Middle School	----	----	----	----
Primary School	0.00	-0.04**	-0.08**	-0.18***
	(0.02)	(0.02)	(0.05)	(0.06)
Less than 3 years or no education	-0.44	-0.04	-0.58***	-0.61***
	(0.10)	(0.05)	(0.20)	(0.15)
Party Membership				
Party Member	0.06***	0.08***	0.05***	0.08***
	(0.01)	(0.02)	(0.02)	(0.02)
Non-party Member	----	----	----	----
Minority				
National Minority	-0.28*	-0.04*	-0.04	0.03
	(0.26)	(0.03)	(0.04)	(0.04)
Non-national Minority	----	----	----	----
Sector				
Farm,fishing, forestry, mining, mineral	0.06**	-0.03	0.00	-0.06
	(0.03)	(0.05)	(0.05)	(0.07)
Manufacturing	-0.03	0.01	-0.06*	-0.10*
	(0.03)	(0.03)	(0.04)	(0.66)
Geological prospecting, Constructing	----	----	----	----
Transport, post, tele, electricity, communicat	0.08**	0.06*	0.14**	0.13**
	(0.03)	(0.04)	(0.05)	(0.13)
Trade, restaurant, marketing, Real Estate	0.04*	0.05	-0.09**	-0.16***
	(0.03)	(0.04)	(0.05)	(0.06)
Social-, personal- and counselling services	0.06	0.01	-0.13***	-0.18***
	(0.09)	(0.09)	(0.05)	(0.06)
Health, Sports, Social Welfare	0.01	-0.00	0.14***	0.09*
	(0.04)	(0.04)	(0.05)	(0.06)
Education, culture, art	-0.04*	-0.00	0.20***	0.07
	(0.03)	(0.04)	(0.04)	(0.06)
Scientific Research & Technical Services	0.06	0.06	0.26***	0.35***
	(0.05)	(0.06)	(0.07)	(0.10)
Finance & Insurance	0.11**	-0.03	0.21***	0.07
	(0.05)	(0.05)	(0.05)	(0.06)
Party & government, or social organs	-0.01	0.00	0.09**	0.01
	(0.04)	(0.05)	(0.04)	(0.06)

Other	0.07	-0.10	0.03	-0.02
	(0.07)	(0.12)	(0.07)	(0.08)
Type of Employment				
Private own or self employed	-0.00	-0.7	0.08*	-0.14
	(0.09)	(0.08)	(0.05)	(0.08)
Professional or Technical	-0.00	0.02	0.08***	0.08***
	(0.02)	(0.02)	(0.03)	(0.03)
Government	0.01	0.05*	0.12***	0.17***
	(0.02)	(0.03)	(0.03)	(0.04)
Office- worker or manager	----	----	----	----
Labor, skilled, unskilled	-0.47***	-0.03*	-0.09***	-0.17***
	(0.01)	(0.02)	(0.02)	(0.03)
Other	----	----	-0.2***	-0.44***
			(0.06)	(0.07)
Ownership				
State-owned	0.13***	0.17***	0.36***	0.28***
	(0.02)	(0.02)	(0.12)	(0.08)
Other Publicly-owned	0.03**	0.11***	----	----
	(0.02)	(0.02)		
Collective	----	----	----	----
Private or Individual	-0.69**	-0.63***	0.28*	0.32***
	(0.20)	(0.12)	(0.19)	(0.13)
Foreign/sino-forei. Joint Venture	0.39***	0.51***	0.08	0.02
	(0.12)	(0.11)	(0.13)	(0.11)
Shareholding company	----	----	0.31	-0.01
			(0.40)	(0.38)
Other	-0.06	0.20	0.25*	0.43***
	(0.17)	(0.26)	(0.14)	(0.12)
Regions				
East	0.06***	0.07***	0.12***	0.03*
	(0.15)	(0.02)	(0.02)	(0.02)
Central	-0.18***	-0.17***	-0.20***	-0.28***
	(0.01)	(0.02)	(0.02)	(0.02)
West	----	----	----	----
R-squared	0.35	0.29	0.25	0.30
Number of observation	3259	2798	5518	4367

Significant at 10 %, ** Significant at 5 %, * Significant at 1 %.*
Source: CHIP, Urban Household Income Survey 1988 and 2002

The overall result illustrates that what really matters for how much a Chinese worker earn is where the workers live (in which region), how old the worker is and their level of education. Both the sectors and the type of employment has also become more important for the outcome of the income. According to previous research (Gustafsson & Li, 2000) the R^2 value in this table seems to be adequate.

6. 3 Decomposition

Using the estimated earnings function from table 3, the average gender income gap in 1988 and 2002 is decomposed in table 4. The Oaxaca-Blinder decomposition divides the wage differential between two groups; one is the "explained" part that captures the differences in productivity characteristics such as education, i.e. $(\overline{Z_m} - \overline{Z_f})\,\hat{\beta}_m$ and can be seen as being based on the assumption that discriminated part should be paid the same as others; this means that men and women with the same characteristics such as age, education or occupation should earn the same.

The other part is the residual part that cannot be accounted for by differences such as for example education; this is often referred to as the part that captures discrimination i.e. the $(\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}$ (Jenn, 2008).

In table 4, about half of the difference (53.4%) in average log-income from 1988 can be explained by differences in average values for variables cross genders. When analysing the differences by parameters estimated for men it is found that the single most important variable for partly explaining the crude gap in 1988 is the age to which 31.28% of the gap can be explained. The second and third most important variables for the same year are party membership and ownership to where 12.86% and 5.16% of the income gap can be explained. The "unexplained part" of the decomposition in 1988, could be seen as pure preference discrimination explains 46.6% of the income gap between the genders.

Table 4: Decomposition of Gender Difference in the Income, 1988

1988	$(\overline{Z_m} - \overline{Z_f})\,\hat{\beta}_m$	Percent of Total	$(\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}$	Percent of Total
Intercept	0	0	0.0764	58.86
Age group	0.0406	31.28	0.0416	32.05
Minority status	-0.0001	-0.00	-0.0089	-6.86
Party Membership	0.0167	12.86	0.0013	1.00
Education level	0.0035	2.69	0.0244	18.80
Sector	0.0000	0.00	-0.0016	-1.23
Type of Employment	0.0019	1.46	-0.0054	-4.16
Ownership	0.0067	5.16	0.0007	0.54

Regions	0.0000	0.00	-0.0680	-52.39
Total	0.0693	53.4	0.0605	46.6

Source: CHIP, Urban Household Income Survey 1988 and 2002

In the second decomposition of the income in 2002 in table 5, only 25% of the differences in income can be explained by differences in average values for variables across genders. In the table it is shown that the most important variable for explaining the income gap between men and women is still the age variable. However, the percentage is not as high as it was in 1988, but now explains solely 18.34 %.

The second and third most important variables to explain the income difference are party membership and type of employment. Type of employment has increased in percentage, while party membership has decreased in percentage of the explained income difference since 1988. Since the "explained part" has decreased in 2002, this means that the "unexplained part has increased. As seen in table 5, 75.20% of the differences in income cannot be explained. This is a significant increase since 1988 and could be seen as pure preference discrimination of women in the income. However, the increase in discrimination can also be due to that the more opened market economy rewards workers different productivity characteristics in a higher degree than during 1988. If these productivity characteristics, such as education, differ a lot between the gender, the income differences between men and women may in fact not be a cause of solely discrimination, but rather a result of related productivity differences between the genders

Table 5: Decomposition of Gender Difference in the Income, 2002

2002	$(\overline{Z_m} - \overline{Z_f})\,\hat{\beta}_m$	Percent of Total	$(\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}$	Percent of Total
Intercept	0	0	0.1123	49.04
Age Group	0.0420	18.34	-0.0997	-43.54
Minority Status	-0.0000	-0.00	-0.1000	-43.67
Party Membership	0.0123	5.37	0.0530	23.14
Education Level	0.0033	1.44	0.1388	60.61
Sector	-0.0033	-1.44	0.0084	3.67
Type of Employment	0.0051	2.23	0.0394	17.21
Ownership	0.0026	1.14	-0.0116	-5.07
Regions	-0.0052	-2.27	0.0316	13.80
Total	0.0568	24.80	0.1722	75.20

Source: CHIP, Urban Household Income Survey 1988 and 2002

As shown in table 6, the explained part can be further decomposed into two terms measuring how the differences in variables between men and women has changed between the years, i.e.

$\overline{((Z_m} - \overline{Z_f})\,\hat{\beta}_m)02 - \overline{((Z_m} - \overline{Z_f})\,\hat{\beta}_m)88$. The other part in the table; $\left((\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}\right)02 - \left((\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}\right)88$, captures the "coefficient effects", that is how the given characteristics are differently rewarded in 1988 compared to 2002.

What can be seen from table 6 is that the single most important source of the increase in the explained part is the type of employment. In the estimated equation for 2002 the income effects of type of employment are much higher than in the equation from 1988. However, party membership, regions and ownership have gone in the opposite direction. This means that these variables have had a smaller impact on the gender income gap in 2002 than in 1988.

Table 6: Difference of Decomposition between 1988 & 2002

	$\overline{((Z_m} - \overline{Z_f})\,\hat{\beta}_m)02 - \overline{((Z_m} - \overline{Z_f})\,\hat{\beta}_m)88$	$\left((\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}\right)02 - \left((\hat{\beta}_m - \hat{\beta}_f)\overline{Z_f}\right)88$
Intercept	0	0.0359
Age group	0.0014	-0.1413
Minority Status	0.0001	-0.011
Party Membership	-0.0044	0.0517
Education Level	-0.002	0.1144
Sector	-0.0033	0.0032
Type of Employment	0.0032	0.0448
Ownership	-0.0041	-0.0123
Regions	-0.0052	0.0996
Total	-0.0125	0.2402

Source: CHIP, Urban Household Income Survey 1988 and 2002

When examining the decomposition composed in this study, the most remarkable change between the years is that the unexplained part, i.e. the part that can be seen as caused by discrimination, has increased remarkably. The unexplained part has increased from 46.6 % in 1988 to 75% in 2002 in China. This result is in line with previous studies. In comparing with the research by Gustafson and Li the discrimination, as part of the decomposition, has increased by more than 11 % every 7th year since 1988 (Gustafsson & Li, 2000).

Since the increase of the unexplained part of the income gap has been significant excessive during these years, the subject deserves further research in order to find a solution to the increasing discrimination between Chinese men and women in the income.

7. Concluding Remarks

Using data from the Chinese Household Income Project, this study has investigated the gender income gap in urban China in 1988 and 2002. During this period China has undergone a rapid transformation from a planned economy towards a more functional market economy, which have impacted the economic welfare of the Chinese citizens. Using both the gini-coefficient and Oaxaca-Blinder decomposition, this study finds that during these fourteen years the annual income has almost doubled. However, with the increase in income the overall inequality in the income has increased, as well as the income gap between men and women.

The results from the study shows that from the estimation of the income functions, it can be observed that the size of the urban Chinese income is highly dependent on where you live in China, your age, education level, party membership and the ownership structure of the employment. The most important result in this study is shown when decomposing the average income between the genders. The analysis shows that about half of the income in 1988 could be explained by differences in average values for variables cross genders. In 2002 this number has thus decreased to only 24.50%. This means that during these fourteens years an increasing part of the average income gap cannot be explained by differences in different characteristics such as education or occupation between the genders, but can be caused by an increase in preference discrimination in the income between the genders in China.

One of the hypotheses in this study was based on Becker's theories of discrimination on the labour market. Becker argued that in an economy with market competition, firms that discriminate wouldn't persist for long since the company who discriminate pays an income to the preferred group that is higher than the marginal revenue (Becker, 1971).

In this study it is shown that the income gap between the genders has increased in China during the time when the country has emerged as a market economy. Especially has the unexplained part of the income gap increased during the years of market liberalisation, which could be seen as an increase of discrimination of women in their income. With an increased competition between firms, why would company choose to discriminate, when they can increase the revenue through employ and pay women equal pay?

To understand this, it must be noted that the theories of Becker where thought to be applied in a well-developed market economy where competition and information are perfect. In China the economy is still developing to becoming a fully developed market economy and there are still dominant structures from the former planned system, which have slowed down the market process. It is therefore more likely that the first hypothesis applies on China, since new-formed firms will try to be free from old egalitarian labour construction and instead provide a

more flexible wage structure. When increasing the autonomy for firms, cultural preferences are enable to flourish and allow employers to preference discriminate against gender in the labour market. However, the increased part of the unexplained part does not have to be entirely caused by an increase in discrimination, what can be seen as an increased discrimination against women can also be caused by the new labour market that has a more flexible wage structure that reflects the market oriented income distribution better than the previous planned system.

This study has its limitations. The OLS regression for 1988 and 2002 only explains around 25-35 % of the annual income. This means that there can be important variables that are missing from the regression. What may seem as pure preference discrimination or "unexplained" in the decomposition when conducting it, can in fact be caused by the exclusion of important variables from the estimation. In previous studies, the same R^2 value has been obtained; however, the "low" R^2 value's effect on the decomposition has not been further discussed, hence it would be of interest to further analyse the effects of missing variables when decomposing income.

A further limitation is that when using the decomposition where there is one "endowment part" and one "unexplained part" which captures the discrimination, the effects can be either over- or underestimating the true effects of the labour market discrimination. Women may for example work in a sector that reflects the gender role imposed to them by the society. However, even if this is a form of discrimination, it is not captured in the measurement as discrimination. Oaxaca wrote in his early research that unequal pay for equal work does not account for the largest part of the wage differentials between men and women. Instead, he argues that it is rather in the concentration of women in lower paying jobs that produce such large differentials (Oaxaca, 1973).

Many previous scholars have argued that the overall increase in inequality in income can be seen as a sufficient explanation for the increase in income gap between the genders in China (Gustafsson & Li, 2000). Since firms gain autonomy to set wages, income differences will occur on all levels. But even though the gender income gap seems to have increased during the last years of transformation in China, compared to other countries the average gender income gap in China can be seen as quite moderate for a transition country and is in fact on a level equal to the United States (25%) (Appleton, Knight, Lina, & Xia, 2002).

The increase of both the overall income inequality and the increase of the inequality between the genders in China might even be understandable considering the former wage policy that overemphasized the egalitarian part. Instead it can be seen as if the economic reforms in China have lead to a shift in emphasis, away from equity and towards greater efficiency with a consequent increase in both the income for many urban Chinese citizens, but also for the income inequality.

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APPENDIX 1: DESCRIPTIVE STATISTICS

Table 7: Summary of Measurement of Variables

Variables	Description
Dependent variables	
$Income_{MALE}$	Average annual logged income for men
$Income_{FEMALE}$	Average annual logged income for women
Control variables	
Age	The age of the participant
Education Level	Measured as different level of education
Party	Measured as 1 if member in Communist party
Minority	Measured as 1 if national minority
Sector	Measured as different sectors of occupation
Type of Employ	Measured as different types of employment
Ownership	Measured as ownership of the employment
Region	Measured as province (region) of household residence

APPENDIX 2: CHINESE PROVINCES

Figure 1: Map of China Divided in Regions

Table 8: Provinces divided by regions

Province	Region
Beijing	East
Shanxi	Central
Liaoning	East
Jiangsu	East
Anhui	Central
Henan	Central
Hubei	Central
Guangdong	East
Yunnan	West
Gansu	West
Sishuan	West

APPENDIX 3: HISTOGRAM OF RESIDUAL

Figure 2: Histogram of the Normality Distribution of the Residual of Male Income in 1988

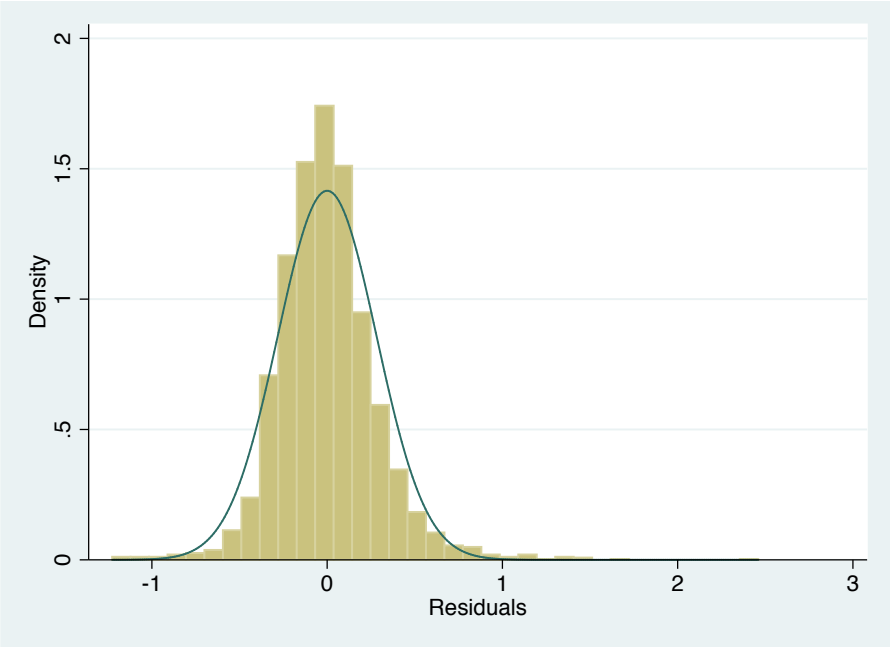

Figure 3: Histogram of the Normality Distribution of the Residual of Female Income in 1988

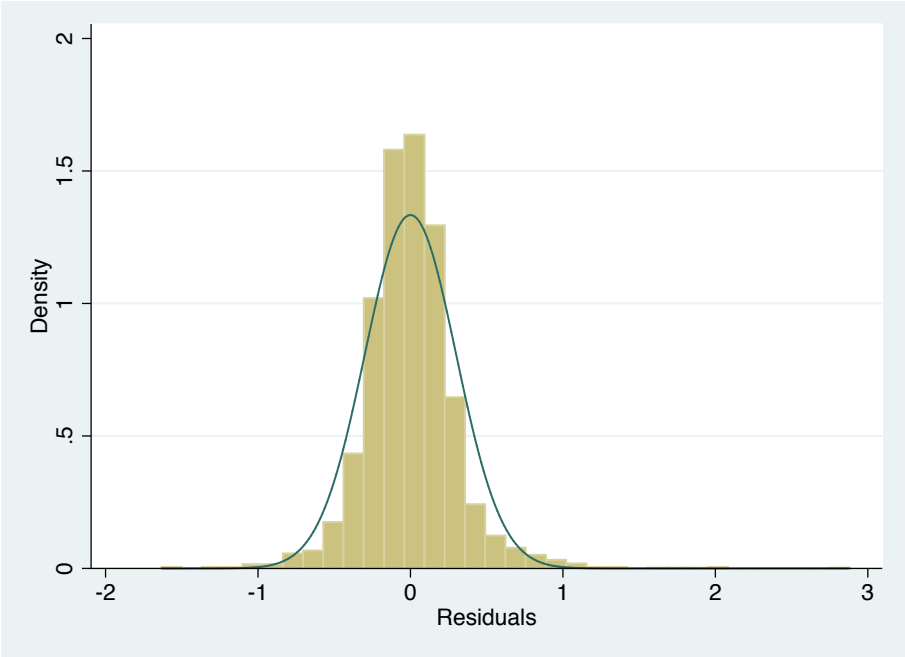

Figure 4: Histogram of the Normality Distribution of the Residual of Male Income in 2002

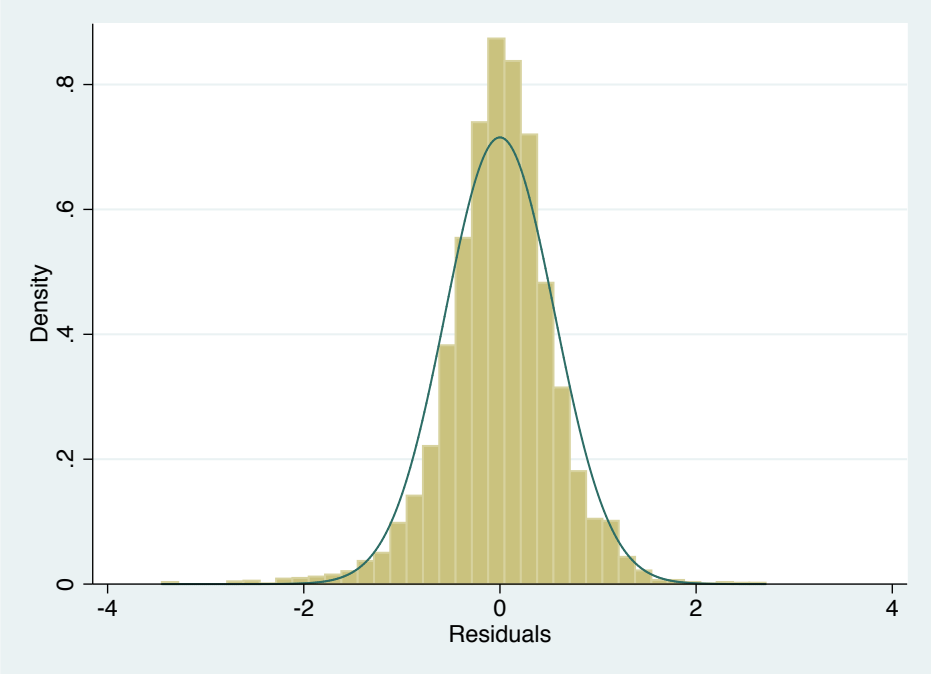

Figure 5: Histogram of the Normality Distribution of the Residual of Female Income in 2002