Three Essays on the Gender Wage Gap and Residential Water Demand

by

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Abstract

This dissertation includes two essays that analyze the wage gap in twelve developing countries, and another essay focuses on residential water demand in China. Chapter 1 decomposes the gender wage differentials in twelve developing countries and examines the variations of gender wage inequality with respect to different levels of education. The wage equations are extended from the Mincer earnings function and estimated for males and females separately by the OLS and Heckman selection models. We found that sample selection bias mainly exists in the female wage equations. The decomposition results suggest that all these developing countries exhibit significant discrimination effects on gender wage inequality from the OLS estimates. And only in Ghana, is discrimination estimated to be insignificant after the selection bias adjustment. The discrimination effect on the gender wage gap is actually offset by the advantages to human capital for women in China. Meanwhile, a decreasing trend in both total male/female wage inequality and discrimination effects against women is examined with increasing education.

Chapter 2 analyzes the wage differentials by both gender and public-private sector. With the multinomial logit estimation, we found that women who are married, have more children under 6 years old or have health problems are not likely to participate in the labor market, especially in private

companies. The returns to education in wage equations are larger for women in both the public and private sectors in most of the countries. After the decomposition, most of the countries show a positive public-private pay gap, and the sector wage differential for women is generally larger than that for men. Meanwhile, the gender wage differential is generally smaller in the public sector, and female employees in the private sector experience more gender discrimination than those in the public sector.

Chapter 3 displays a residential water demand analysis based on panel data covering 31 provinces of China from 2004 to 2013. Two models are employed in this study: Traditional log-linear model and the EDM model. The estimates from the log-linear model show that different levels of income do not impact water price elasticities significantly but the fixed effects estimator gives a more appropriate estimate for the water demand system. With the EDM model estimations, the results reveal that the water price is elastic for residential water demand in the short run, and the partial price-supply elasticity is negative due to estimates of total elasticities.

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Chapter 1. Impact of Education on the Gender Wage Gap and Discrimination

1.1. Introduction

The gender wage gap has been intensively studied by researchers since the early 1990s, as women are paid universally less than men in the worldwide labor markets, even though the inequality trend has been reduced in many economically advanced nations (Blau and Kahn, 2008; Blau and Kahn, 2016). Hundreds of studies have been carried out to examine the extent of male/female wage inequality, and many of them indicate male/female wage differentials are variously attributed to differences in both gender discrimination and human capital (Hossain and Tisdell, 2005; Ahmed and Maitra, 2010; Chang and England, 2011; Ahmed and McGillivray, 2015; Schäfer and Gottschall, 2015; Card, at el, 2015). Meanwhile, education, as an essential trait of human capital, has been inferred to play a decisive role in compositions of the gender wage gap. Miki and Yuval (2011) suggest that women tend to pursue higher levels of education than men to compensate for being discriminated against in the job market. Then it is rational to have an assumption that the gender wage gap as well as discrimination could be reduced by more competitive human capital which is associated with higher levels of education.

In this study we segment the compositions of gender wage gap of twelve developing countries (Armenia, Bolivia, China, Colombia, Georgia, Ghana, Kenya, Laos, Macedonia, Sri Lanka, Ukraine and Vietnam), and then examine the variations of gender inequality regarding different levels of education. More particularly, we ask whether the gender wage gap narrows with higher levels of education. In order to decompose the effect of gender discrimination and different endowments of human capital, we apply the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) on data from the STEP Skills Measurement Household Survey (World Bank, 2012). The study focuses on a data sample of both employed and unemployed individuals. Self-employed workers are excluded, as the determinants of self-employed earnings are not consistent with wages of normal employees (Hundley, 2000). Since earnings data of unemployment is missing in our dataset, sample selection bias may exist if we only choose the employees sample. For adjusting the bias, we finally employ the Heckman selection model and make a comparison of estimations between basic OLS and Heckman selection.

Our findings show that the sample selection bias mainly exists in the female wage equations. And all twelve developing countries exhibit significant discrimination effects on the gender wage inequality. A downward trend is manifested not only in total male/female wage inequality but also in discrimination effects against women with increasing level of education.

The paper is organized as follows. Section 2 presents a literature review of gender wage gap studies. Section 3 describes the data sources, sample selection and sample statistics. In Section 4, we summarize the methodology of gender wage differential analysis. In Section 5, we estimate the wage equation, conduct the Blinder- Oaxaca decomposition analysis on the gender wage gap, and provide the empirical results by education. Conclusions are stated in section 6.

1.2. Literature Review

The earliest study of gender wage inequality dates back to the 1950s. With the perfect male/female substitute model assumption, Becker (1957) supposes that men's earning is higher than that of women with the labor market equilibrium, since male employees are preferred by employers over female due to their "taste discrimination." Then the effects of discrimination are estimated by Oaxaca (1973), using the data from 1967 Survey of Economic Opportunity in the U.S. The estimated form is described as "the residual left after adjusting the gender differential for differences in various characteristics". His result shows that the effects of discrimination give rise to a substantial proportion of gender wage inequality. Blinder (1973) provides a more structured form of wage inequality for not only the gender group division but also the race (white/black) group division. In his study, the wage gap between the high- income group and low-income group can be described by two parts. One is estimated as "the value of the advantage in endowments possessed by the high-wage group as evaluated by the high-wage group's wage equation"; and another one is described as "the difference between how the high-wage equation would value the characteristics of the low-wage group and how the low wage equation actually values them". Based on the theoretical frame, his results show that the gender wage differential is completely caused by gender discrimination.

The Blinder-Oaxaca decomposition of the gender wage gap has been extended by several wage studies. Brown (1980) emphasizes the effects of occupational segregation by adding the “fraction parameters” of the employees in occupation, while Juhn (1991) and Wellington (1993) provide intertemporal decompositions which can decompose the variations of gender wage inequality by time trend. The main difference between these two decomposition methods is: the unexplained gender wage gap from the Juhn (1991) decomposition is estimated by the multiplication between standard deviations of the residual and the standardized residual from the gender wage regression, while for the Wellington (1993) decomposition, the changes of unexplained gender wage differential by time are examined by the variations of coefficients from both male and female wage regressions. All of these decomposition methods are extensively used by recent wage studies.

Meng (1998) decomposed the gender wage gap for rural-urban migrants in the city of Jinan, China by using the Brown (1980) decomposition. Three types of occupations (Industry, Service and Self-employed) are involved in the data sample. Meanwhile, the probability of occupation choices is estimated by the multinomial logit regression. With the Brown (1980) decomposition, the effects of occupational segregation on gender wage inequality are examined by the differences between the observed probability and predicted probability. The results indicate that male/female occupational segregation is mainly caused by the unequal treatment of gender traits in occupational assignment, and occupational segregation significantly contributes to the gender wage gap among rural-urban migrants. Brown and Pagan (1999) constructed a similar study on the gender wage gap in Mexico.

The main difference is that it decomposes the change in the gender wage gap with time. Brown and Pagan (1999) combined the Brown (1980) and Wellington (1993) decompositions to explain both the impact of occupational attainment on gender wage inequality and the variation of the wage gap during the period of 1987-1993. The study shows that the increase of the male/female wage differential is mainly caused by relative changes in human capital endowments, but it is alleviated by a significant decline in the gender differential in occupational attainment.

Hughes and Maurer-Fazio (2002) applied Blinder-Oaxaca decomposition and Neumark (1988) decomposition to explain the impact of marriage, education and occupation on the gender wage differential in urban areas of China. Compared with the Blinder-Oaxaca decomposition, the male/female gap in human capital endowments is estimated using the coefficients from a pooled male-female wage regression in the Neumark (1988) decomposition, and the unexplained gender wage gap is found to be relatively smaller than that from the Blinder-Oaxaca decomposition in the Hughes and Maurer-Fazio (2002) study. Their results indicate that married women experience larger gender wage gaps and gender discrimination than their unmarried counterparts. Meanwhile, gender wage gaps are smaller for women with higher levels of education, but type of occupation is not shown to have as much impact on the gender wage gap as type of industry in the urban labor markets of China.

Arabs and Carneiro (2003) and Liu (2004) analyzed the variations of gender wage inequality over time in Brazil and Vietnam respectively, using the

Juhn (1991) decomposition. The studies found the male/female wage gap fell between 1988 and 1998 mainly because of a reduction in discrimination against women, and the human capital of women has begun to improve with macroeconomic conditions and trade reform in Brazil. In contrast, improvement in the human capital endowments of women is entirely offset by increasing gender wage discrimination between 1993 and 1998 in Vietnam due to its "traditional culture." Pham and Reilly (2007) applied a distributional decomposition and the Juhn (1991) decomposition on a more recent sample data than Liu (2004) to explain the changes of gender wage gap in Vietnam from 1993 to 2002. They decomposed the gender wage differential not only a time trend, but also by different quantiles. The coefficients of male and female wage equations are estimated by the quantile regression. Their results show that the average gender wage gap has been reduced sharply since 1998.

More recently, Rendall (2013) defined two neoteric variables in the wage equations- "brain" and "brawn"- to distinguish the physical and intellectual occupations. The decomposition method of Black and Spitz-Oener (2010), extended from the Wellington (1993) decomposition, is adopted to explain the impact of changing labor demand requirements on gender wage inequality in four developing countries. The study indicates that India exhibits the largest gender wage inequality due to the greatest physical labor requirements, compared with the other three countries. While gender inequality was reducing in both wages and labor force participation in Brazil, because the labor requirement structure was transforming from brawn demands to brain demands. Ahmed and McGillivray (2015) applied three methods (Blinder-Oaxaca, Distributional and Wellington) on gender wage gap decomposition in Bangladesh. Each kind of human capital endowment as well as gender discrimination on male/female differentials are examined during the period 1999-2000. The results are robust with each decomposition method, and show that the gender wage gap decreased significantly due to the key driver of improvement in female education.

Compared with the previous studies in developing countries, more research is being conducted for developed countries recently (Rica and Dolado, 2008; Chang and England, 2011; Schäfer and Gottschall, 2015; Card and Cardoso, 2015; Blau and Kahn, 2016). Table 1.1 reports the sample country, data resources, decomposition methods and raw gender wage gap of the selected studies. In addition, the wage equation estimations are enhanced by the Heckman selection model to deal with the possible selection bias on choices of participating into jobs or not (Pham and Reilly, 2007; Chang and England, 2011; Ahmed and McGillivray, 2015). As the dataset is only from the single year survey and no time trend is included, we will employ the classic Blinder-Oaxaca decomposition and Heckman selection model to examine the gender wage inequality in twelve developing countries as well as the impact of education on gender wage discrimination.

Table 1. 1 Selected studies on gender wage gap

Study	Country	Data Resources	Estimation Techniques	Raw Gender Wage Gap (logs)[a]
		Studies of Developing Countries		
Meng (1998)	China	1994 Jinan Migration Survey	Multinomial logit model and Brown (1980) decomposition	Migrants: 0.290 Rural: 0.225
Brown and Pagan, at el (1999)	Mexico	1987and 1993 National Urban Employment Survey	Multinomial logit model and Wellington decomposition	0.135-0.183
Hughes and Maurer-Fazio (2002)	China	1992 Chinese Labor Market Research Project	Blinder-Oaxaca decomposition Neumark (1988) decomposition	0.066
Arabs and Carneiro, at el (2003)	Brazil	1988, 1992 and 1998 PNADs	Juhn (1991) decomposition	0.335-0.147
Liu (2004)	Vietnam	1993 and 1998 Vietnam Living Standards Surveys	Juhn (1991) decomposition	0.260-0.190
Pham and Reilly (2007)	Vietnam	1993-2002 Vietnam Living Standards Surveys	Selected quantile regression and Distributional decomposition	0.290-0.093
Rendall (2013)	Brazil, Mexico, India, Thailand	1987-2008 World Bank Household Survey and IPUMS	Extended Wellington decomposition	India: 0.511 (Max) Mexico: -0.059 (Min)
Ahmed and McGillivray (2015)	Bangladesh	1999, 2005 and 2009 Labor Force Surveys	Heckman selection regression, Blinder-Oaxaca, Distributional and Wellington decomposition	0.578

Studies of Developed Countries				
Gill and Leigh (2000)	United States	1985-1994 NLSY	Juhn (1991) decomposition	0.198 - 0.131
Hunt (2002)	Germany	1990-1994 German Socio-Economic Panel	Juhn (1991) decomposition	0.330-0.210
Rica and Dolado, at el (2008)	Spain	1999 European Community Household Panel	Selected quantile regression and Distributional decomposition	0.227
Chang and England (2011)	Japan, South Korea and Taiwan	2006 Family Module of the East Asian Social Survey	Selection-corrected earnings regression and decomposition	Japan: 0.720 Korea: 0.470 Taiwan: 0.240
Schäfer and Gottschall (2015)	24 European countries and Germany	1995 and 2002 Structure of Earnings Survey, and 2008 Linked employer-Employee Data Base	Mixed-effects linear regression and Logit regression	Latvia: 0.560 (Max) Luxembourg: 0.020 (Min)
Card and Cardoso, at el (2015)	Portuguese	2002-2009 Quadros de Pessoal	Two-way worker-firm effects model and extended Blinder- Oaxaca decomposition	0.234
Blau and Kahn (2016)	United States	1980-2010 PSID Microdata	Juhn (1991) decomposition	0.477-0.231

[a] Raw gender wage gap indicates the mean difference of male/female pay gap.

To decompose the gender wage gap, studies commonly begin with estimations of the wage equation. No matter how the independent variables change due to different research purposes, education is an important factor in human capital and is always involved in the wage estimation (Chang and England, 2011; Rendall, 2012; Han and Liu, 2012; Ahmed and McGillivray, 2015). The impact of education on personal income is significant and easy to estimate. However, many studies only focus on the education endowment estimations involved in the gender wage gap, but not on the relationship between education level and gender wage differential (Liu, 2004; Chang and England, 2011; Ahmed and McGillivray, 2015). Although people can earn more salaries with relatively higher levels of education, it is still hard to judge gender wage inequality or gender wage discrimination is narrowed by women who receive higher level of education. The endowment of education only estimates how much gender wage inequality is attributed to different levels of education. But if we want to know how education affects the gender wage gap or gender wage discrimination, the gender wage gap should be examined by each level of education. The variations of gender wage inequality with different levels of education can provide a basic sense of the impact of education on male/female wage inequality (Hughes and Maurer- Fazio, 2002; Rica and Dolado, 2008).

1.3. Data Description

Data applied in this study are collected from the STEP Skills Measurement Household Survey conducted by the World Bank (2012) in twelve developing countries, including the Yunnan city of China, Armenia, Bolivia, Colombia, Georgia, Ghana, Kenya, Lao PDR, Macedonia, Sri Lanka, Ukraine and Vietnam. The surveys were separated in two waves (2012 and 2013). The first wave includes the countries: Lao PDR, Sri Lanka, Bolivia, Colombia, Yunnan of China, Vietnam and Ukraine, while the second wave contains Armenia, Kenya, Georgia, Ghana and Macedonia.

1.3.1. Sample selection

The ages of individuals included in our sample range from 15 to 64, in order to exclude people who could be children or retired. In fact, the retirement age varies in different countries. Georgia and Bolivia have the oldest official retirement age for men, which is 65 years old, while women can retire at age of 60. Armenia's official retirement age is 63 for both men and women. In China, men can generally retire at 60 years, and women at 50. These retirement ages are only enforced in the public sector, but sometimes can be extended for special occupations, such as government positions or professional occupations. Actually, a large proportion of men and women continue to work beyond the age of 60. According to our data sample, all the countries have wage employees in the 60-64 age group except Kenya. This may be caused by Kenya's limited sample size.

The individuals in our sample data are separated into two groups: wage employees and non-participant. Self-employed and full-time students are excluded as their wage determinants are different from those of normal employees (Hundley, 2000). The details of sample selection are given in Table 1.2. The total sample size is 27,302, in which 11,741 individuals are employees, and 15,561 observations are from non-participants. Moreover, 16,591 individuals are women, and 10,711 observations are from men. For most of the countries involved in this study, the survey samples have more non-participants than wage employees except for Yunnan of China, Bolivia and Vietnam. Therefore, there may be sample selection bias when we estimate the earning function with only wage employee data by OLS, especially for the female wage equation, since the choices between being employed and non-participating might not be random and could be determined by some personal characteristics (Rica and Dolado, at el, 2008; Chang and England, 2011; Ahmed and McGillivray, 2015).

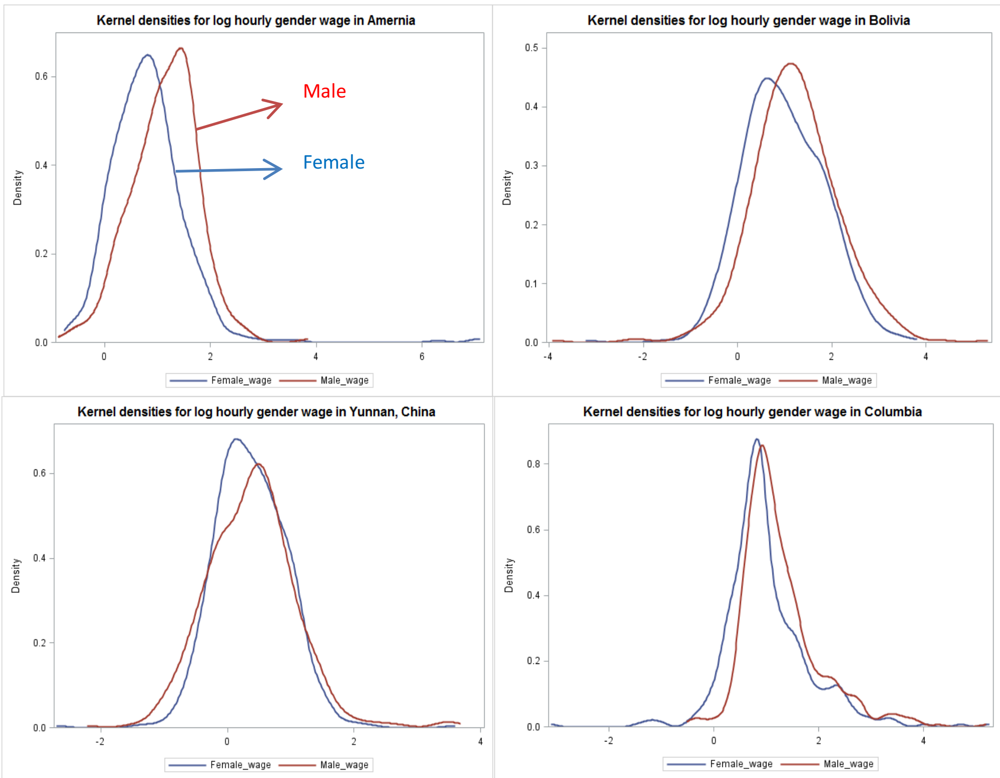
Table 1. 2 Sample selection, by country

ID	Country	Work Status[a]	Female	Male	Total
CH	Yunnan, China	Wage employees	514	527	1041
		Non-participants	486	292	778
AM	Armenia	Wage employees	560	317	877
		Non-participants	1506	445	1951
BO	Bolivia	Wage employees	446	455	901
		Non-participants	499	231	730
CO	Colombia	Wage employees	437	468	905
		Non-participants	662	247	909
GE	Georgia	Wage employees	498	271	769
		Non-participants	1433	621	2054
GH	Ghana	Wage employees	271	482	753
		Non-participants	560	349	909
KE	Kenya	Wage employees	490	840	1330
		Non-participants	1018	521	1539
LA	Laos	Wage employees	290	372	662
		Non-participants	541	253	794
MKD	Macedonia	Wage employees	655	703	1358
		Non-participants	1330	855	2185
LK	Sri Lanka	Wage employees	334	576	910
		Non-participants	1187	237	1424
UA	Ukraine	Wage employees	600	320	920
		Non-participants	776	307	1083
VN	Vietnam	Wage employees	717	598	1315
		Non-participants	781	424	1205
Total			16591	10711	27302

[a] Non-participants include home workers and individuals who did not work at all during the preceding week of survey.

1.3.2. Sample statistics

The sample statistics for wage employees are reported in Table 1.3. The hourly wage is standardized in US dollars for each country. We find that workers have the highest hourly wage in Armenia, and the lowest in Yunnan of China. Figure 1.1 provides the distributions of log hourly wages for both male and female by country. As it is shown, the distributions of log hourly wage for men and women differ in the lower tail, but look similar in the upper tail except in Ukraine. Moreover, women with relatively lower earnings account for larger proportions than men in most of these countries, which implies the existence of potential gender wage differentials.



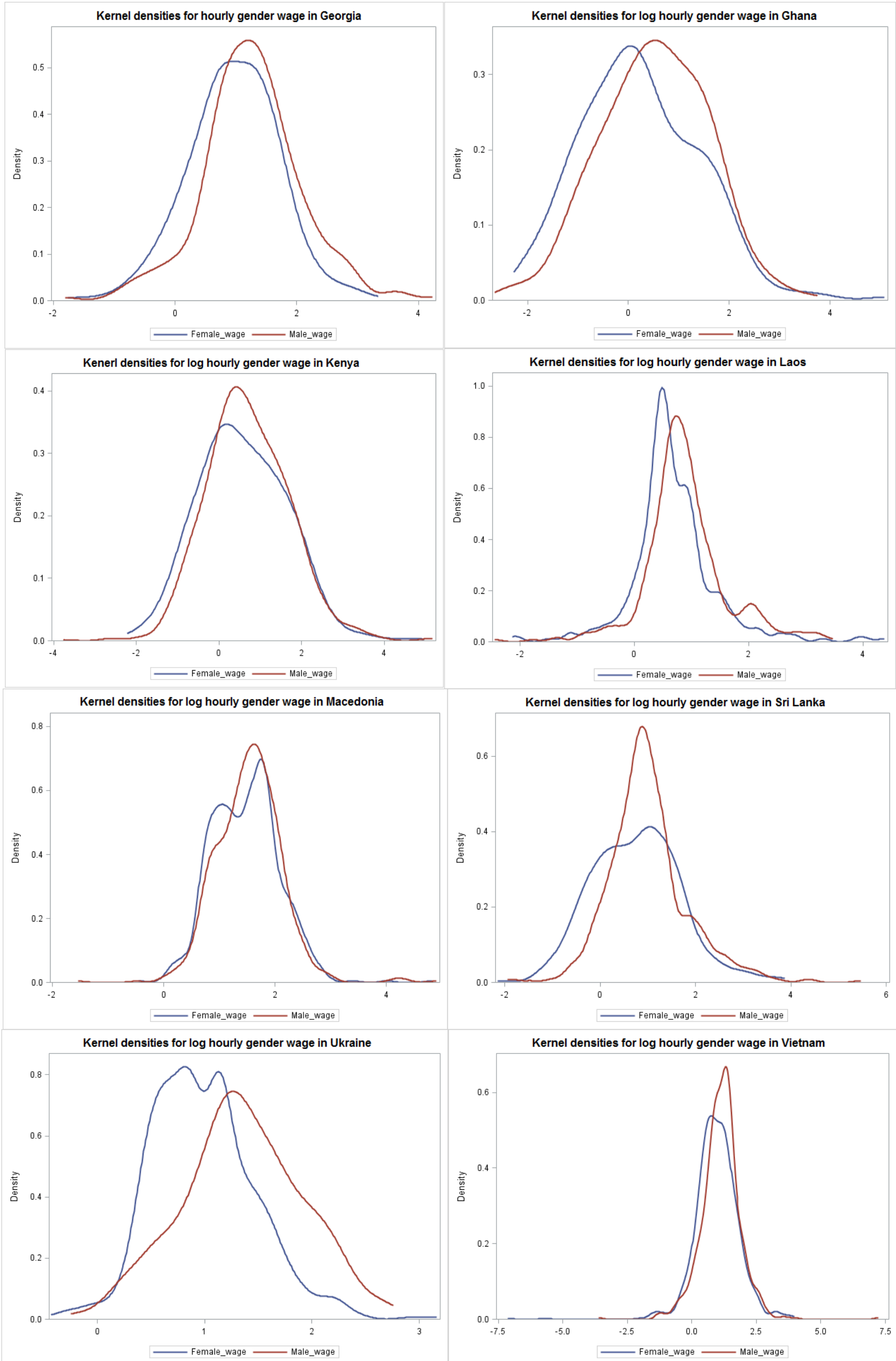


Figure 1. 1 Kernel Densities for Log Hourly Gender Wage, by Country

Considering the gender structure of this sample data, there are more male wage employees than female employees, although it involves more female individuals than male in the data set (see Table 1.2). Clearly, men are more likely to participate in a job in most of these twelve developing countries. The age structure of wage employees varies widely by country in this study. Specifically, the age group 40-44 in this data set from China accounts for the largest proportion of wage employees at 19 percent; while in Armenia the age group 50-54 has the most at 14 percentages. However, Bolivia, Ghana and Kenya have younger wage employees, and the ages are most likely to range from 20 to 29. Conversely, Armenia, Georgia, Macedonia and Ukraine have the oldest average working ages in our dataset. For another important characteristic- working occupation- we separate positions into four groups. As we can see from Table 1.3, white collar workers represent a higher proportion than those from the occupations of machine operators and skilled farmers. Moreover, it also shows that negative asset wealth is predominant except in China, Armenia, Ghana, Kenya, and Laos.

Table 1.4 exhibits more detailed information on educational status of wage employees. It is shown that employees in Armenia have the highest average years of education for women and men, while in Sri Lanka individuals have the shortest average years of education. In addition, women in seven countries, including Yunnan of China, Armenia, Georgia, Laos, Macedonia, Sri Lanka and Ukraine, are likely to receive more years of education than men. To study the changes in gender wage gap due to different levels of education, we classify the educational qualifications into four levels and two programs as given in Table 1.4. The wage employees mainly distribute in upper secondary education and undergraduate education with education levels classified for both men and women, except in Ghana. In addition, compared with the education structure of male wage employees, female employees have a larger proportion on undergraduate and higher education than men except in Kenya and Laos. This phenomenon implies women who are employed may need higher levels of education than men. In terms of education programs, our data sample involves larger numbers of individuals with general education than those with vocational education in all twelve countries.

Except for the indicators discussed above, we also have variables such as working experience (number of months in current job), training experience, industrial or government certificate in skills, and marital status to describe some other aspects of human capital (Albrecht et al, 2009). At the same time, the variables "head of family", "number of children under 6", "health status (has a chronic illness)" and "marital status" are selected to control for the possibility of being wage employees or not (Ahmed and McGillivray, 2015).

Table 1. 3 Summary statistics for wage employees, by country[a]

Variable	CH	AM	BO	CO	GE	GH	KE	LA	MKD	LK	UA	VN
Hourly wage in US dollars	1.893	6.405	4.745	4.925	4.057	2.975	3.632	3.239	5.565	4.117	3.564	4.899
	(2.589)	(58.488)	(8.563)	(10.948)	(4.612)	(7.102)	(8.916)	(5.257)	(6.744)	(9.719)	(2.321)	(37.862)
Log of hourly wage	0.377	0.934	1.106	1.139	1.070	0.408	0.652	0.802	1.501	0.912	1.113	1.037
	(0.649)	(0.733)	(0.907)	(0.782)	(0.793)	(1.125)	(1.039)	(0.759)	(0.597)	(0.880)	(0.543)	(0.837)
Female dummy = 1	0.494	0.639	0.495	0.483	0.648	0.360	0.368	0.438	0.482	0.367	0.652	0.545
	(0.500)	(0.481)	(0.500)	(0.500)	(0.478)	(0.480)	(0.483)	(0.497)	(0.500)	(0.482)	(0.477)	(0.498)
Age	39.525	41.424	32.355	34.720	41.303	33.212	30.860	35.619	41.349	38.454	41.401	37.097
	(9.530)	(12.835)	(11.634)	(11.227)	(12.044)	(10.847)	(9.144)	(10.909)	(11.184)	(11.336)	(12.044)	(10.815)
Age 15-19 dummy = 1	0.011	0.009	0.130	0.046	0.005	0.031	0.034	0.054	0.007	0.033	0.008	0.023
	(0.102)	(0.095)	(0.336)	(0.210)	(0.072)	(0.172)	(0.181)	(0.227)	(0.081)	(0.179)	(0.087)	(0.149)
Age 20-24 dummy = 1	0.056	0.104	0.174	0.159	0.085	0.169	0.223	0.121	0.043	0.085	0.071	0.113
	(0.229)	(0.305)	(0.380)	(0.366)	(0.278)	(0.375)	(0.417)	(0.326)	(0.204)	(0.278)	(0.256)	(0.316)
Age 25-29 dummy = 1	0.100	0.123	0.176	0.187	0.108	0.278	0.295	0.156	0.118	0.129	0.143	0.147
	(0.300)	(0.329)	(0.381)	(0.390)	(0.310)	(0.448)	(0.456)	(0.363)	(0.323)	(0.335)	(0.351)	(0.354)
Age 30-34 dummy = 1	0.139	0.122	0.139	0.159	0.133	0.175	0.171	0.154	0.152	0.146	0.120	0.164
	(0.346)	(0.327)	(0.346)	(0.366)	(0.339)	(0.380)	(0.377)	(0.361)	(0.359)	(0.353)	(0.325)	(0.371)
Age 35-39 dummy =	0.188	0.106	0.123	0.131	0.133	0.108	0.108	0.166	0.149	0.155	0.115	0.176

1	(0.391)	(0.308)	(0.329)	(0.338)	(0.339)	(0.310)	(0.311)	(0.373)	(0.357)	(0.362)	(0.319)	(0.381)
Age 40-44 dummy = 1	0.190	0.090	0.088	0.095	0.131	0.070	0.067	0.124	0.138	0.152	0.110	0.107
	(0.393)	(0.286)	(0.283)	(0.293)	(0.338)	(0.256)	(0.250)	(0.330)	(0.345)	(0.359)	(0.313)	(0.310)
Age 45-49 dummy = 1	0.175	0.109	0.067	0.096	0.113	0.061	0.051	0.112	0.115	0.118	0.126	0.113
	(0.380)	(0.312)	(0.249)	(0.295)	(0.317)	(0.240)	(0.220)	(0.315)	(0.319)	(0.322)	(0.332)	(0.317)
Age 50-54 dummy = 1	0.081	0.140	0.047	0.067	0.116	0.039	0.024	0.054	0.116	0.086	0.145	0.084
	(0.272)	(0.347)	(0.211)	(0.251)	(0.320)	(0.193)	(0.153)	(0.227)	(0.321)	(0.280)	(0.352)	(0.278)
Age 55-59 dummy = 1	0.047	0.114	0.037	0.043	0.104	0.046	0.017	0.047	0.113	0.060	0.100	0.055
	(0.212)	(0.318)	(0.188)	(0.203)	(0.305)	(0.211)	(0.130)	(0.211)	(0.317)	(0.238)	(0.300)	(0.228)
Age 60-64 dummy = 1[b]	0.013	0.082	0.020	0.015	0.073	0.024	0.008	0.012	0.049	0.037	0.063	0.018
	(0.115)	(0.275)	(0.140)	(0.123)	(0.260)	(0.153)	(0.091)	(0.109)	(0.215)	(0.190)	(0.243)	(0.134)
Years of education	13.134	14.006	12.257	10.776	15.571	11.186	10.089	11.094	13.395	9.630	13.570	12.144
	(3.361)	(3.427)	(4.303)	(3.688)	(2.882)	(5.223)	(4.795)	(5.230)	(3.468)	(3.879)	(2.196)	(4.258)
Primary education or under dummy = 1	0.063	0.001	0.109	0.241	0.005	0.178	0.295	0.145	0.009	0.190	0.001	0.149
	(0.244)	(0.034)	(0.312)	(0.428)	(0.072)	(0.383)	(0.456)	(0.352)	(0.094)	(0.393)	(0.033)	(0.356)
Lower secondary education dummy = 1	0.256	0.044	0.156	0.048	0.029	0.268	0.117	0.119	0.099	0.263	0.011	0.155
	(0.437)	(0.206)	(0.364)	(0.213)	(0.167)	(0.443)	(0.321)	(0.324)	(0.299)	(0.440)	(0.104)	(0.362)
Upper secondary education dummy = 1	0.301	0.249	0.362	0.393	0.209	0.274	0.426	0.187	0.563	0.415	0.452	0.270
	(0.459)	(0.432)	(0.481)	(0.489)	(0.407)	(0.446)	(0.495)	(0.390)	(0.496)	(0.493)	(0.498)	(0.444)

Undergraduate education or upper dummy = 1	0.379	0.704	0.373	0.318	0.757	0.280	0.162	0.276	0.328	0.132	0.536	0.426
	(0.485)	(0.457)	(0.484)	(0.466)	(0.429)	(0.449)	(0.369)	(0.448)	(0.470)	(0.339)	(0.499)	(0.495)
Vocational education dummy = 1	0.360	0.243	0.223	0.303	0.208	0.154	0.120	0.163	0.484	0.187	0.511	0.024
	(0.480)	(0.429)	(0.417)	(0.460)	(0.406)	(0.361)	(0.325)	(0.370)	(0.500)	(0.390)	(0.500)	(0.152)
General education dummy = 1	0.576	0.754	0.668	0.456	0.787	0.668	0.584	0.420	0.507	0.623	0.488	0.827
	(0.494)	(0.431)	(0.471)	(0.498)	(0.410)	(0.471)	(0.493)	(0.494)	(0.500)	(0.485)	(0.500)	(0.378)
Number of months in current job	104.309	117.209	59.332	1.580	107.827	66.124	51.732	116.411	139.396	120.364	117.670	110.678
	(108.172)	(124.824)	(85.979)	(0.494)	(121.283)	(86.457)	(60.810)	(110.645)	(130.240)	(117.809)	(119.798)	(107.234)
Participated in a training in last 12 months dummy = 1	0.175	0.152	0.289	0.243	0.220	0.173	0.169	0.160	0.129	0.109	0.030	0.096
	(0.380)	(0.359)	(0.453)	(0.429)	(0.414)	(0.378)	(0.375)	(0.367)	(0.335)	(0.312)	(0.172)	(0.294)
Has an industry or govt certificate dummy = 1	0.287	0.089	0.285	0.024	0.173	0.100	0.101	0.080	0.179	0.098	0.080	0.307
	(0.453)	(0.285)	(0.452)	(0.154)	(0.378)	(0.300)	(0.301)	(0.272)	(0.383)	(0.297)	(0.272)	(0.462)
Married dummy = 1	0.808	0.609	0.322	0.193	0.624	0.432	0.514	0.713	0.706	0.743	0.702	0.709
	(0.394)	(0.488)	(0.467)	(0.395)	(0.485)	(0.496)	(0.500)	(0.453)	(0.456)	(0.437)	(0.458)	(0.455)
High skilled white collar dummy = 1	0.284	0.548	0.375	0.202	0.551	0.356	0.259	0.352	0.397	0.291	0.478	0.393
	(0.451)	(0.498)	(0.484)	(0.402)	(0.498)	(0.479)	(0.438)	(0.478)	(0.489)	(0.455)	(0.500)	(0.489)
Low skilled white collar dummy = 1	0.458	0.223	0.251	0.368	0.244	0.295	0.387	0.177	0.268	0.174	0.170	0.264
	(0.498)	(0.417)	(0.434)	(0.483)	(0.430)	(0.456)	(0.487)	(0.382)	(0.443)	(0.379)	(0.375)	(0.441)
Machine operator or	0.140	0.107	0.198	0.206	0.095	0.224	0.178	0.095	0.236	0.286	0.242	0.221

skilled agriculture dummy = 1	(0.347)	(0.310)	(0.398)	(0.404)	(0.293)	(0.417)	(0.383)	(0.294)	(0.425)	(0.452)	(0.429)	(0.415)
Elementary operators dummy = 1[b]	0.117	0.096	0.170	0.222	0.099	0.125	0.174	0.284	0.090	0.231	0.100	0.105
	(0.322)	(0.294)	(0.376)	(0.416)	(0.299)	(0.331)	(0.380)	(0.451)	(0.286)	(0.422)	(0.300)	(0.307)
Asset wealth index	0.024	0.091	-0.033	-0.092	-0.078	0.189	0.022	0.160	-0.059	-0.07	-0.044	-0.102
	(0.977)	(0.934)	(1.001)	(0.969)	(0.972)	(0.932)	(1.018)	(0.836)	(0.913)	(0.674)	(0.969)	(1.067)
Head of family dummy = 1	0.442	0.375	0.396	0.487	0.381	0.699	0.720	0.421	0.353	0.497	0.195	0.395
	(0.497)	(0.484)	(0.489)	(0.500)	(0.486)	(0.459)	(0.449)	(0.494)	(0.478)	(0.500)	(0.396)	(0.489)
Number of children under 6 year old	0.131	0.292	0.508	0.367	0.336	0.425	0.453	0.538	0.295	0.421	0.187	0.405
	(0.340)	(0.600)	(0.777)	(0.649)	(0.626)	(0.713)	(0.695)	(0.696)	(0.595)	(0.626)	(0.450)	(0.657)
Has chronic illness dummy = 1	0.119	0.164	0.185	0.149	0.140	0.074	0.038	0.104	0.083	0.107	0.342	0.161
	(0.324)	(0.371)	(0.389)	(0.356)	(0.348)	(0.263)	(0.192)	(0.306)	(0.276)	(0.309)	(0.475)	(0.368)

[a] The summary statistics are described as mean value of each variable, with standard deviation in parentheses.
[b] Implies reference categories in the estimated equations.

Table 1. 4 Selected sample means and proportions of wage employee education, by gender and country

Variables	CH	AM	BO	CO	GE	GH	KE	LA	MKD	LK	UA	VN
	Male Sample											
Years of education[a]	12.60	13.95	12.33	10.82	15.31	11.26	10.33	11.29	13.02	9.25	13.24	12.16
Education Levels (%)												
Primary education or under	8.35	0.32	10.11	23.72	0.37	16.80	26.79	17.20	1.14	19.44	0.31	14.55
Lower secondary education	31.50	5.36	16.48	5.98	2.95	29.25	11.67	12.90	11.24	30.03	0.94	15.38
Upper secondary education	28.27	28.08	36.92	40.17	26.57	27.59	44.29	15.59	60.60	41.32	54.69	29.77
Undergraduate education or upper	31.88	65.93	36.48	30.13	70.11	26.35	17.26	30.38	27.03	9.20	44.06	40.30
Education Programs (%)												
Vocational education	31.12	20.50	20.66	29.27	19.93	15.77	11.07	15.32	52.35	17.36	56.56	3.68
General education	60.53	78.86	69.23	47.01	79.70	67.43	62.14	43.55	46.51	63.19	43.13	81.77
	Female Sample											
Years of education[a]	13.68	14.04	12.19	10.73	15.71	11.05	9.67	10.85	13.80	10.28	13.75	12.13
Education Levels (%)												
Primary education or under	4.28	0.00	11.66	24.49	0.60	19.56	34.29	11.03	0.61	18.26	0.00	15.20
Lower secondary education	19.65	3.93	14.80	3.43	2.81	22.51	11.63	10.69	8.55	19.76	1.17	15.62

Upper secondary education	31.91	23.04	35.43	38.44	17.87	26.94	39.59	22.76	51.76	41.92	40.17	24.69
Undergraduate education or upper	44.16	72.86	38.12	33.64	78.71	31.00	14.49	24.14	39.08	20.06	58.67	44.49
Education Programs (%)												
Vocational education	41.05	26.43	23.99	31.35	21.29	14.76	13.67	17.59	44.12	20.96	48.17	1.26
General education	54.67	73.39	64.35	44.16	78.11	65.68	52.04	40.00	55.27	60.78	51.83	83.54

[a] Denotes sample means. Other table entries represent the proportion of the sample with a particular characteristic.

1.4. Econometric Methodology

1.4.1. Wage equation and specification

According to the Mincer earnings function (Mincer, 1974), it is conventional to specify the wage equation with log wages and a set of earnings determining characteristics. The dependent variable used in our wage estimation is specified as a natural log of hourly earnings. The independent variables include controls for human capital, such as age, working experience, education, marriage, skill certificate, training and occupations. Specifically, age is described as a series of dummies by different periods of age instead of a continuous variable, while working experience is exhibited by number of months in current job. In fact, the age variable and its quadratic have often been used in the standard human capital wage specification to substitute for the potential working experience (Hughes and Maurer-Fazio, 2002). But this has been shown to be less accurate for females than males. However, for our study, the coefficients of quadratic age terms in most of wage equations are insignificant, and their signs have varied due to the wage equations of different countries. In order to better explain the effect of each age group on gender wage, we select to use the discrete age dummies instead of the continuous age indicator. Moreover, we involve both age and working experience variables, since the working experience variable cannot fully capture the impact of labor market experience on wages, as it only accounts experiences in current job. The age group dummies are used in many studies (Gupta, Oaxaca, and Smith, 2006; Albrecht et al., 2009; Chzhen and Mumford, 2011). For another essential determinant of human capital wage specification, education is indicated by "years of education" in this study, since it could avoid introducing noise into the measurement of education, compared with the dummies of highest completed education (Pham and Reilly, 2007). We also add an asset wealth index in the wage equation, which summarizes the living conditions that could affect individual earning as an important external determinant. The set of other worker characteristics involved in our wage equation are captured by dummy variables of marital status, industry or government recognized certificate, training, and occupation types.

According to the sample selection displayed in Table 1.2, we suggest employees may not be a random subset in the data sample, but are determined by terms of observables and unobservables against people who are not employed (Ahmed and McGillivray, 2015). To correct the selection bias caused by non-random distributed observations, we apply the standard two-stage Heckman (1979) selection model to estimate the wage equation. In the first stage, it estimates the probability of being employed with instrumental variables including the number of children under 6 years old, health status and relationship with household head. This process is performed by estimating the Probit equation, separately for men and women:

$$\Pr\left[employed_{ij} = 1 | Z_{ij}\right] = Z_{ij}\gamma_j + \varepsilon_{ij} \qquad (1)$$

where i indicates the individual, and j denotes for male or female. Z_{ij} represents the vectors of instrumental variables that can determine the conditions of being employed or not. $employed_{ij}$ is a dummy variable with

$employed_{ij} = 1$ when people are wage employees and $employed_{ij} = 0$ if not.

In the second stage, the wage equation

$$ln\ (wage)_{ij} = X_{ij}\beta_j + \rho_j\sigma_j\lambda_{ij} + \mu_{ij} \qquad (2)$$

is estimated by OLS for each country by gender, where $ln\ (wage)_{ij}$ is log hourly wage, X_{ij} represents the vector of exogenous variables of human capital, and λ_{ij} denotes the inverse Mill's ratio that implies the unobservables in the first stage. λ_{ij} is estimated by $\phi(Z_{ij}\gamma_j)/\Phi(Z_{ij}\gamma_j)$ from equation (1). ρ_j is the correlation between ε_{ij} and μ_{ij}, and σ_j indicates the adjusted standard error for the wage equation regression. If the coefficient ρ_j is significantly different from zero, then it means the unobservable factors in the selection model are correlated with the unobservables in the second stage (which implies selection bias).

1.4.2. Blinder-Oaxaca decomposition

To analyze the composition of the gender wage gap, we perform the well-known Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) at the means to split the total gender wage differential. Two components are identified: the segment of the gap attributable to a gender differential in observable characteristics of human capital, and the residual part between male and female returns to these characteristics (Hughes and Maurer-Fazio, 2002). The latter part is considered to be the component of gender wage differential, that is generally attributed to gender discrimination and also the gender gap in unobservable characteristics. Here, we define D_{OLS} as the total differential between the expected male and female wages estimated by the wage equations with OLS. Then the total gender wage gap can be described by the equation:

$$D_{OLS} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_m + \bar{X}_f(\hat{\beta}_m - \hat{\beta}_f) \qquad (3)$$

where $\hat{\beta}_m$ and $\hat{\beta}_f$ are the OLS estimators from male and female wage equations respectively. The item $(\bar{X}_m - \bar{X}_f)\hat{\beta}_m$ indicates the explained element of the gender wage gap attributable to the gender differentials in observed characteristics. The formula $(\hat{\beta}_m - \hat{\beta}_f)$ represents the unexplained components caused by the gender discrimination and gender differences in unobserved characteristics.

Based on the Blinder-Oaxaca decomposition, the total gender wage differentials in each level of education are given by

$$D_k = \overline{lnwage}_{mk} - \overline{lnwage}_{fk} = \bar{X}_{mk}\hat{\beta}_m - \bar{X}_{fk}\hat{\beta}_f$$
$$= (\bar{X}_{mk} - \bar{X}_{fk})\hat{\beta}_m + \bar{X}_{fk}(\hat{\beta}_m - \hat{\beta}_f) \qquad (4)$$

where k donates the level of education that has been classified in Section 2, and k = 1, 2, 3, and 4. $\bar{X}_{mk}$ and $\bar{X}_{fk}$ are the means of predictors in the male and female wage equations respectively with corresponding level of education. When sample selection bias was identified, the decomposition equation is transformed to

$$D_{Heck} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_m + \bar{X}_f(\hat{\beta}_m - \hat{\beta}_f)$$
$$+ (\hat{\rho}_m\hat{\sigma}_m\bar{\lambda}_m - \hat{\sigma}_f\hat{\rho}_f\bar{\lambda}_f) \qquad (5)$$

The item $\left(\hat{\rho}_m \hat{\sigma}_m \bar{\lambda}_m - \hat{\sigma}_f \hat{\rho}_m \bar{\lambda}_f\right)$ comes from the differences in the average selection bias, and will be treated as an additional effect of the unobserved characteristics on gender wage inequality (Choudhury, 1993; Ahmed and McGillivray, 2015).

1.5. Empirical Results

1.5.1. Gender wage differentials

The differences between the means of male and female wages (raw gender wage differential) are reported in Table 1.5. The results show significant differentials between male and female wages in most of the countries except in Yunnan of China. Specifically, Ukraine exhibits the largest gender wage differential with a raw wage gap ratio of 0.361, estimated by the mean of $\log\left(wage_m / wage_f\right)$. This implies that, in Ukraine, men averaged 43% higher earnings than women. Conversely, the gender wage differential in Macedonia is only around 6%. Yunnan of China does not show a significant difference in the raw gender wage gap ratio, but the conditional wage gap is examined to be significant at the 5% level. The conditional wage gap in Macedonia also shows a similar transformation. The conditional gender wage gap is described by the parameter estimate of the gender dummy in the pooled wage equation which allows the controlling for the characteristics of human capital. The significant estimate in conditional gender wage gap implies the existence of gender discrimination against women in these countries, even though the raw gender wage gap is not such significant. This result is also consistent with the results from the Blinder-Oaxaca decomposition. The inverse consequence happens in Ghana and Kenya, which suggests that gender differentials in human capital contribute to a large proportion of the gender wage gap.

We also provide the raw wage gap ratio by the highest completed level of education as well as by the type of educational programs. The highest completed levels of education are classified into four groups, and the lowest level of education is primary education or under. The gender wage differentials in the lowest educational level are only significant in Colombia, Ghana and Sri Lanka but omitted in Armenia, Georgia and Ukraine because of lacking samples. As we can see from Table 1.4, the percentage of women in the primary or lower levels of education is zero in Armenia and Ukraine, while in Georgia the number of men in the lowest level of education only equals one. The results show a significant gender wage differential in the highest level of education in China, although the combined male/female wage differential is insignificant. But for the other countries, the gender wage gap decreases in the level of undergraduate or higher education, compared with that in the level of upper secondary education. Regardless of the section of lowest level of education, the gender wage differentials decrease with higher level of education in most of countries except in China, Armenia, Bolivia and Kenya. Therefore, better education could offset the male/female wage differential in some developing countries to some extent. When it comes to the effect of types of educational programs, our results do not show a clear impact on the gender wage differential. The changes of gender wage gap between a vocational education program and a general education program are not consistent among these developing countries.

Table 1. 5 Average wages and gender wage differentials, by education and country

Average (log) hourly wage	CH	AM	BO	CO	GE	GH	KE	LA	MKD	LK	UA	VN
Male[a]	0.381	1.131	1.228	1.267	1.259	0.511	0.697	0.892	1.529	1.003	1.349	1.125
	(0.031)	(0.036)	(0.044)	(0.034)	(0.050)	(0.049)	(0.035)	(0.039)	(0.022)	(0.035)	(0.032)	(0.032)
Female[a]	0.372	0.822	0.981	1.002	0.968	0.226	0.573	0.687	1.471	0.754	0.988	0.963
	(0.025)	(0.032)	(0.041)	(0.039)	(0.034)	(0.072)	(0.049)	(0.045)	(0.023)	(0.051)	(0.020)	(0.033)
Raw wage gap ratio (r)	0.010	0.309***	0.246***	0.265***	0.291***	0.285***	0.124**	0.205***	0.058*	0.249***	0.361***	0.162***
	(0.040)	(0.051)	(0.060)	(0.051)	(0.059)	(0.085)	(0.059)	(0.059)	(0.032)	(0.060)	(0.036)	(0.046)
	Raw wage gap ratio at the education level[b]											
Primary education or under	0.214	--	0.317*	0.354***	--	0.494***	0.097	0.250*	-0.043	0.457***	--	0.166
	(0.145)	--	(0.178)	(0.077)	--	(0.172)	(0.086)	(0.138)	(0.203)	(0.122)	--	(0.107)
Lower secondary education	0.047	0.374*	0.108	0.644**	0.551	0.643***	-0.464***	0.478***	0.208**	0.563***	0.535**	0.327***
	(0.086)	(0.194)	(0.126)	(0.259)	(0.341)	(0.137)	(0.164)	(0.162)	(0.009)	(0.127)	(0.211)	(0.097)
Upper secondary education	0.035	0.398***	0.288***	0.248***	0.378***	0.309**	0.135*	0.079	0.144***	0.255***	0.497***	0.236***
	(0.056)	(0.084)	(0.092)	(0.071)	(0.129)	(0.134)	(0.081)	(0.127)	(0.037)	(0.083)	(0.050)	(0.070)
Undergraduate education or upper	0.194***	0.304***	0.277***	0.225**	0.299***	0.002	0.126	-0.034	0.097*	0.217	0.289***	0.097

	(0.057)	(0.062)	(0.090)	(0.097)	(0.066)	(0.139)	(0.125)	(0.123)	(0.051)	(0.146)	(0.050)	(0.069)
	Raw wage gap ratio at the education program[c]											
Vocational education	0.097	0.466***	0.225**	0.210***	0.122	0.107	0.163	0.077	0.113***	0.130	0.477***	0.001
	(0.061)	(0.106)	(0.109)	(0.080)	(0.124)	(0.202)	(0.129)	(0.145)	(0.042)	(0.119)	(0.045)	(0.243)
General education	-0.013	0.242***	0.223***	0.238***	0.322***	0.232**	0.006	0.146	0.059	0.238***	0.271***	0.167***
	(0.055)	(0.057)	(0.076)	(0.086)	(0.064)	(0.103)	(0.080)	(0.093)	(0.047)	(0.080)	(0.055)	(0.050)
Differential (%)[d]	0.962	36.193	27.941	30.317	33.763	32.936	13.190	22.777	5.950	28.261	43.462	17.551
Conditional wage gap[e]	0.087**	0.296***	0.179***	0.229***	0.362***	0.133*	0.051	0.212***	0.182***	0.344**	0.337***	0.176***
	(0.036)	(0.054)	(0.054)	(0.047)	(0.057)	(0.076)	(0.049)	(0.061)	(0.026)	(0.057)	(0.037)	(0.041)

[a] Denotes sample means.
[b] Shows raw wage gap ratio by levels of education.
[c] Shows raw wage gap ratio by education programs.
[d] Indicates the percentage differential between male and female wage, calculated by $(e^r - 1) * 100$.
[e] Given by the gender dummy variable in an OLS regression with controls on human capital.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

1.5.2. Probit regression

The probit estimates for likelihood of female and male participation in employment by country are reported in Table A.1 and Table A.2 in Appendix, respectively. The results suggest that women who are married, and have more children under 6 years old or health problems are not likely to participate in the labor market in most of the sample countries. Specifically, the effects of being married are estimated to be significant in seven countries including Armenia, Bolivia, Colombia, Georgia, Kenya, Macedonia and Sri Lanka, and the impacts of number of children under 6 years old are significant in most of countries except Bolivia and Kenya. Although the influences of health condition and family position are only significant in half of these countries to some extent, this suggests a positive effect of being head of family and the contrary effect of having health problems on the likelihood of participating in employment for women. This consequence implies that the condition of being married shows something more than just the conflict of childcare or other types of family responsibilities with wage-earning jobs (Ahmed and McGillivray, 2015).

In addition, the positively significant impacts of education suggest that an increase in years of education raises the probability of participating in employment for women, but the effects of education are much smaller for men. Moreover, being married exhibits a positive and significant effect on the dependent variable with the male sample and the impacts of number of children are insignificant in most of countries. This suggests that education as an essential trait of human capital does not display such an important effect for male workers as that for female workers, since men are more likely to support their families in these developing countries.

1.5.3. Wage regression

The estimates of the wage equations by country for both women and men are displayed in Appendix Table A.3. Two estimation methods, OLS and Heckman selection, are employed in this study. The Heckman selection model can examine the selection bias by testing the relationship between the residuals of the two stages, and adjusts the error terms of the second stage with the estimated inverse Mill's ratio and coefficients from the first stage (as specified in Eqn. 2). Panel A of Table A.3 reports the OLS estimates for both female and male samples, while Panel B presents the adjusted estimates from the Heckman selection model.

The estimated results differ not only due to the regional differences but also to the gender disparity. Firstly, the discrepant estimates and their inconsistent significance of the age groups in different countries reflect the diverse age structures of wage distributions. For example, the estimated coefficients of age 25-29 are the largest in Yunnan of China for both women and men, using a reference category of age 60-64. But in Armenia the highest wage earning group is the age group between 20 and 24 for men and the age 50-54 for women. The age factors do not show a significant effect on the employee earning in Bolivia (for both women and men), Ghana (for men only), Laos (for women only) or Kenya (for men only).

Considering the impact of education, a notable finding is that the returns to years of education are evidently larger for women in most countries, with the only exception being Yunnan of China. A similar result was obtained by some other studies in Bangladesh (Ahmed and McGillivray, 2015) and Mexico (Popli, 2013). With the reference category set at elementary occupation, the coefficients of high skill white collar dummies display the largest return on employee earnings in most of these countries. Meanwhile, the returns to high skill white collar work are generally greater for men. But we did not find a consistent effect of machine operator/skilled agriculture or low skilled white collar work among these countries. The occupation of low skilled white collar exhibits even lower returns on wage compared with the elementary occupation in the male samples of Armenia, Georgia, Ghana and Vietnam.

Having an industry or government certificate does not have a significant impact on employee wages while the training variable does in many of these countries. The estimates modestly show that participating in a training program tends to enhance female income rather than male earnings. The asset wealth index also shows a positive and significant correlation with individual earnings except in Ghana, Ukraine and Vietnam. An interesting finding is that, for three countries (Yunnan of China, Armenia and Kenya), the income impacts of being married are positive for males but negative for females.

In terms of sample selection problems, a significant correlation between residuals of choice equations and wage equations is more likely to happen with female samples. The results suggest that selection bias exists in the samples from China, Armenia, Colombia (female only), Georgia (female only), Ghana (female only), Macedonia (female only) and Ukraine (female only). After the selection bias adjustment, there are some changes in the coefficient estimates compared with the unadjusted OLS estimates, but the overall pattern is not modified significantly. It is notable that the sample selection adjustment raises the estimates to education for women with the significant and positive correlation between the two stage residuals. This implies that some unobserved factors with positive effects on female employment choices play a positive role in determining their wages.

1.5.4. Gender wage gap decomposition

In this section, we summarize the Blinder-Oaxaca decomposition results for the gender wage differentials from the twelve developing countries. The decomposition analyses are processed with both the OLS estimates and the selection bias adjusted (Heckman) estimates. Columns 1-6 of Table 1.6 show the gender wage gap decomposition with the OLS estimates, and the positive values indicate the advantage in favor of males and vice versa. We can find that only Yunnan of China shows an insignificant differential on the observed male and female wages. However, due to the Blinder-Oaxaca decomposition, the explained effect and the discrimination effect on gender wage gap are found to be significant but opposite in sign (explained effect equals -0.071 and discrimination effect equals 0.081). The insignificant observed gender wage differential implies that the discrimination on earnings against women is compensated by the better human capital endowment of women in China. Moreover, the advantage in human capital for women is mainly contributed by the relatively higher levels of female education, since the education effect on the male/female wage gap is negative and the absolute value is larger than that of the explained effect.

Georgia, Laos, Macedonia, and Sri Lanka also reveal a negative explained effect on the male/female earning gap, which means female wage employees in these samples have greater human capital than men. But due to the positive and even larger absolute value of discrimination effects, the results still display a significant and positive wage gap between men and women in these countries. In addition, the explained effects in Armenia, Colombia, Kenya, and Vietnam are not significant, and the male employees in Bolivia, Ghana, and Ukraine are shown to have significantly greater human capital than women. Moreover, the level of education of wage employees does not exhibit a significant difference except in China, Kenya, Macedonia, Sri Lanka and Ukraine. Regardless of explained effects, all these countries reveal significant discrimination in the earnings against women with the OLS estimates of wage equations. Yunnan of China is shown to have the smallest wage discrimination at the value of 0.081, while Georgia is examined to have the largest wage discrimination against women at 0.381 (see Table 1.6).

The decomposition based on the selection bias adjustment is reported in columns 7-12 of Table 1.6. The changes brought by the selectivity adjustment on the explained effects are not very substantial, with the exception of Armenia. The value of the explained effect in Armenia is transformed to be negative, but the effect on gender wage inequality is still insignificant. This is because the estimates of wage equations do not experience a substantial change with the selectivity adjustment. Hence, the variations mainly occur in the magnitude of discrimination effects, but with no consistent pattern. Specifically, the value of discrimination effects increases in Armenia, Bolivia, Colombia, Georgia, Macedonia, Ukraine and Vietnam, but decreases in China, Ghana, Kenya, Laos and Sri Lanka. Particularly, the effect of discrimination declines from 0.152 to -0.334 in Ghana, which causes the gender wage discrimination against women to disappear completely. However, the positive selection bias effect implies the sample differences in unobserved characteristics would tend to exacerbate the male/female wage inequality. The selection bias effect is captured by the inverse Mill's ratio. In contrast, the increasing effect of discrimination is always accompanied by the negative selection bias effect, in this situation the discrimination against women was shown to be offset by female advantages embedded in unobservables to some extent.

Finally, we decompose the gender wage inequality within the classified levels of education. Individuals are sorted to have the same educational attainment in each of educational levels. Hence the gender inequality caused by educational differences is weakened within the same levels. The changes of gender wage gap decomposition between each level of education will tell us the impact of education itself on the gender wage discrimination, but does not account for the compensation effect from better personal education. As we can see from Table 1.6, nine nations including China, Armenia, Colombia, Ghana, Laos, Macedonia, Sri Lanka, Ukraine and Vietnam reveal a decreasing trend in wage discrimination against women, related to higher levels of education, based on the OLS estimates. Only Bolivia, Georgia and Kenya are estimated to have the largest discrimination effect in undergraduate or higher levels. After selection bias adjustment, the discrimination effects in Bolivia and Georgia change to become decreases with higher levels of education. These results suggest that education would tend to promote the social equality in these developing countries, since women are more likely to be treated equally with better education. Considering the gender wage gap decomposition based on vocational and general education programs, it seems that there is no consistent pattern that can be obtained from our results.

Table 1. 6 Blinder-Oaxaca decomposition[a] for gender wage gap, by country

	OLS						Selection bias adjusted					
	CH	AM	BO	CO	GE	GH	CH	AM	BO	CO	GE	GH
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Observed wage gap	0.010	0.309***	0.246***	0.265***	0.291***	0.285***	0.010	0.309***	0.246***	0.265***	0.291***	0.285***
	(0.040)	(0.051)	(0.060)	(0.051)	(0.059)	(0.085)	(0.040)	(0.051)	(0.060)	(0.051)	(0.059)	(0.085)
Education effect[b]	-0.073***	-0.002	0.003	0.004	-0.017*	0.013	-0.102***	-0.0004	0.003	0.004	-0.014*	0.013
	(0.014)	(0.006)	(0.007)	(0.011)	(0.009)	(0.024)	(0.019)	(0.001)	(0.007)	(0.011)	(0.007)	(0.024)
Explained effect	-0.071***	0.008	0.078**	0.031	-0.090**	0.133***	-0.115***	-0.007	0.078**	0.023	-0.094**	0.119***
	(0.024)	(0.022)	(0.036)	(0.027)	(0.038)	(0.045)	(0.030)	(0.020)	(0.035)	(0.026)	(0.037)	(0.043)
	Explained effect at the education level											
Primary education or under	-0.046	--	0.251***	0.071**	--	0.243***	-0.101	--	0.263***	0.066**	--	0.231***
	(0.062)	--	(0.063)	(0.034)	--	(0.063)	(0.084)	--	(0.058)	(0.033)	--	(0.066)
Lower secondary education	0.015	0.192**	0.049	-0.068	-0.034	0.127**	0.018	0.167**	0.059	-0.057	-0.042	0.102*
	(0.027)	(0.086)	(0.045)	(0.077)	(0.189)	(0.057)	(0.033)	(0.071)	(0.040)	(0.073)	(0.184)	(0.055)
Upper secondary education	0.059**	0.102**	0.109***	0.067***	-0.001	0.224***	0.038	0.081**	0.104**	0.050**	-0.010	0.201***
	(0.027)	(0.041)	(0.042)	(0.024)	(0.069)	(0.054)	(0.033)	(0.038)	(0.040)	(0.023)	(0.069)	(0.053)

Undergraduate education or upper	0.031	-0.012	0.040	0.020	-0.069*	0.078	0.026	-0.035	0.035	0.016	-0.075*	0.078
	(0.028)	(0.024)	(0.049)	(0.045)	(0.039)	(0.055)	(0.030)	(0.023)	(0.048)	(0.044)	(0.039)	(0.053)
	Explained effect at the education program											
Vocational education	0.002	-0.042	-0.007	0.027	-0.133*	0.069	-0.027	-0.057	-0.020	0.015	-0.140**	0.071
	(0.030)	(0.042)	(0.061)	(0.033)	(0.069)	(0.077)	(0.036)	(0.040)	(0.059)	(0.032)	(0.068)	(0.075)
General education	-0.048	0.017	0.069	0.001	-0.092**	0.081	-0.077**	0.003	0.071	-0.004	-0.094**	0.064
	(0.031)	(0.026)	(0.047)	(0.042)	(0.041)	(0.050)	(0.038)	(0.022)	(0.044)	(0.041)	(0.040)	(0.048)
Discrimination effect	0.081***	0.301***	0.169***	0.234***	0.381***	0.152***	0.041***	1.734***	0.443***	0.912***	1.021***	-0.334***
	(0.009)	(0.012)	(0.013)	(0.010)	(0.014)	(0.017)	(0.009)	(0.021)	(0.012)	(0.016)	(0.016)	(0.014)
	Discrimination effect at the education level											
Primary education or under	0.104***	--	0.119***	0.318***	--	0.401***	0.053**	--	0.433***	1.123***	--	-0.343***
	(0.028)	--	(0.041)	(0.024)	--	(0.039)	(0.025)	--	(0.036)	(0.031)	--	(0.045)
Lower secondary education	0.092***	0.356***	0.083***	0.265***	0.390***	0.237***	0.035*	2.284***	0.479***	1.007***	1.317***	-0.284***
	(0.018)	(0.055)	(0.029)	(0.056)	(0.071)	(0.022)	(0.018)	(0.086)	(0.030)	(0.091)	(0.072)	(0.023)
Upper secondary education	0.071***	0.312***	0.142***	0.208***	0.339***	0.147***	0.033**	2.085***	0.448***	0.902***	1.118***	-0.294***
	(0.014)	(0.025)	(0.018)	(0.013)	(0.034)	(0.022)	(0.014)	(0.035）	(0.018)	(0.025)	(0.036)	(0.021)
Undergraduate	0.081***	0.295***	0.242***	0.200***	0.390***	-0.064**	0.049***	1.591***	0.428***	0.759***	0.984***	-0.399***

education or upper	(0.014)	(0.014)	(0.023)	(0.017)	(0.016)	(0.025)	(0.014)	(0.022)	(0.021)	(0.023)	(0.017)	(0.025)
	Discrimination effect at the education program											
Vocational education	0.076***	0.326***	0.193***	0.209***	0.388***	-0.027	0.040***	1.844***	0.432***	0.856***	1.119***	-0.364***
	(0.014)	(0.023)	(0.027)	(0.015)	(0.032)	(0.037)	(0.014)	(0.030)	(0.024)	(0.027)	(0.034)	(0.037)
General education	0.082***	0.293***	0.168***	0.205***	0.379***	0.118***	0.041***	1.692***	0.449***	0.835***	0.990***	-0.324***
	(0.011)	(0.013)	(0.016)	(0.014)	(0.016)	(0.017)	(0.011)	(0.026)	(0.015)	(0.023)	(0.017)	(0.015)
Selection bias effect							0.084	-1.432	-0.275	-0.670	-0.636	0.500

[a] Decomposition at the mean. A positive entry indicates an advantage in favor of males.
[b] Differences in education, indicate the compensating effect on the gender wage gap. Estimated by $(\bar{X}_{educ\_m} - \bar{X}_{educ\_f})\hat{\beta}_{educ\_m}$
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued

	OLS						Selection bias adjusted					
	KE	LA	MKD	LK	UA	VN	KE	LA	MKD	LK	UA	VN
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Observed wage gap	0.124**	0.205***	0.058*	0.249***	0.361***	0.162***	0.124**	0.205***	0.058*	0.249***	0.361***	0.162***
	(0.059)	(0.059)	(0.032)	(0.060)	(0.036)	(0.046)	(0.059)	(0.059)	(0.032)	(0.060)	(0.036)	(0.046)
Education effect[b]	0.022**	0.001	-0.041***	-0.044***	-0.005***	0.001	0.022**	0.002	-0.041***	-0.045***	-0.004***	0.001

	(0.009)	(0.001)	(0.010)	(0.011)	(0.001)	(0.015)	(0.009)	(0.001)	(0.010)	(0.012)	(0.001)	(0.014)
Explained effect	0.042	-0.026**	-0.112***	-0.087***	0.052***	0.002	0.041	-0.019	-0.112***	-0.095***	0.052***	0.005
	(0.039)	(0.012)	(0.019)	(0.026)	(0.019)	(0.023)	(0.039)	(0.014)	(0.019)	(0.025)	(0.019)	(0.022)
Explained effect at the education level												
Primary education or under	-0.040	-0.057	-0.009	0.116***	--	0.040	-0.041	-0.070	-0.009	0.088***	--	0.043
	(0.035)	(0.039)	(0.108)	(0.035)	--	(0.032)	(0.035)	(0.042)	(0.108)	(0.033)	--	(0.031)
Lower secondary education	-0.124	-0.013	-0.015	0.061**	0.492**	-0.012	-0.124	-0.016	-0.015	0.053*	0.486**	-0.008
	(0.079)	(0.029)	(0.032)	(0.030)	(0.158)	(0.035)	(0.079)	(0.034)	(0.032)	(0.027)	(0.155)	(0.032)
Upper secondary education	0.007	-0.049**	-0.062***	-0.085***	0.139***	0.001	0.006	-0.049*	-0.062***	-0.090***	0.139***	0.002
	(0.048)	(0.024)	(0.016)	(0.030)	(0.025)	(0.026)	(0.048)	(0.025)	(0.016)	(0.029)	(0.025)	(0.025)
Undergraduate education or upper	-0.021	-0.015	-0.017	-0.018	0.015	0.029	-0.021	0.019	-0.017	-0.020	0.015	0.032
	(0.080)	(0.021)	(0.023)	(0.042)	(0.025)	(0.021)	(0.080)	(0.021)	(0.023)	(0.042)	(0.025)	(0.021)
Explained effect at the education program												
Vocational education	-0.041	-0.001	-0.085***	-0.105**	0.085***	-0.092	-0.041	0.025	-0.085***	-0.112***	0.085***	-0.087
	(0.087)	(0.025)	(0.018)	(0.042)	(0.026)	(0.100)	(0.087)	(0.026)	(0.018)	(0.041)	(0.025)	(0.097)
General education	0.002	-0.028*	-0.098***	-0.126***	0.043	-0.005	0.002	-0.016	-0.099***	-0.129***	0.042	-0.002
	(0.053)	(0.016)	(0.031)	(0.032)	(0.027)	(0.022)	(0.053)	(0.018)	(0.031)	(0.030)	(0.026)	(0.022)
Discrimination effect	0.082***	0.231***	0.170***	0.336***	0.309***	0.160***	0.056***	0.057***	0.522***	0.256***	0.584***	0.255***
	(0.013)	(0.020)	(0.006)	(0.010)	(0.009)	(0.007)	(0.013)	(0.017)	(0.010)	(0.011)	(0.009)	(0.009)

	Discrimination effect at the education level											
Primary education or under	0.100***	0.480***	0.118	0.416***	--	0.256***	0.070***	0.211***	0.887***	0.313***	--	0.389***
	(0.024)	(0.045)	(0.065)	(0.015)	--	(0.018)	(0.024)	(0.039)	(0.088)	(0.016)	--	(0.019)
Lower secondary education	0.047	0.374***	0.224***	0.385***	0.392***	0.229***	0.017	0.157***	0.785***	0.288***	0.846***	0.363***
	(0.037)	(0.047)	(0.019)	(0.024)	(0.087)	(0.024)	(0.038)	(0.036)	(0.021)	(0.027)	(0.050)	(0.028)
Upper secondary education	0.045**	0.140***	0.199***	0.331***	0.357***	0.137***	0.021	-0.003	0.633***	0.255***	0.686***	0.238***
	(0.019)	(0.035)	(0.009)	(0.016)	(0.013)	(0.014)	(0.019)	(0.035)	(0.010)	(0.016)	(0.012)	(0.016)
Undergraduate education or upper	0.169***	0.007	0.119***	0.227***	0.275***	0.116***	0.146***	-0.118***	0.311***	0.173***	0.509***	0.181***
	(0.028)	(0.034)	(0.007)	(0.022)	(0.011)	(0.009)	(0.028)	(0.031)	(0.010)	(0.022)	(0.011)	(0.010)
	Discrimination effect at the education program											
Vocational education	-0.015	0.157***	0.211***	0.267***	0.343***	0.165*	-0.039	0.015	0.618***	0.200***	0.655***	0.243**
	(0.028)	(0.038)	(0.009)	(0.021)	(0.012)	(0.078)	(0.028)	(0.036)	(0.012)	(0.021)	(0.011)	(0.083)
General education	0.096***	0.115***	0.137***	0.336***	0.278***	0.142***	0.071***	-0.038	0.440***	0.258***	0.517***	0.231***
	(0.266)	(0.030)	(0.007)	(0.014)	(0.012)	(0.008)	(0.017)	(0.026)	(0.014)	(0.015)	(0.013)	(0.009)
Selection bias effect							0.027	0.167	-0.352	0.088	-0.275	-0.098

1.6. Conclusion

In this study, we decompose the gender wage differentials in twelve developing countries and examine the variations of gender wage inequality under different levels of education. The wage equations are extended from the Mincer earnings function for males and females separately and estimated by both the OLS and Heckman selection model for each of the countries. From the sample described in Table 1.2, our data includes more observations for women than men but fewer female wage employees than male employees. We suggest that women are more likely to choose not to participate in employment, and the possibility of selection is related to their household characteristics such as marital status, number of children, health status and so on. The Heckman selection model has been employed to test and adjust the selection bias for the wage equations, and our results verify the assumption that the selection bias mainly exists in the female wage equations.

The Blinder-Oaxaca decomposition provides a systematic and rational partition of the gender wage differential. Although no significant gender inequality is found in the labor wage in China, the Blinder-Oaxaca decomposition analyses suggest that the discrimination effect on the gender wage gap is actually offset by the advantages of human capital for women. The female interviewees involved in the data sample for China were revealed to have a better quality of human capital, but received an equal wage with men on average. This confirms the significant discrimination effect against women in labor wages in China. All twelve developing countries exhibit significant discrimination effects on gender wage inequality. Only that in Ghana is completely eliminated with the selection bias adjustment in the wage equation estimates. But the gender differentials in observed characteristics are captured by the inverse Mill's ratio, and tend to raise the male/female wage inequality.

The compensating effects of education decomposed from the gender wage gap are insignificant in most of these countries. Only Kenya shows a significant advantage of education for men, while China, Macedonia, Sri Lanka, and Ukraine show greater educational attainments for women conversely. In fact, we are more concerned about the social equality promoted by the respect for the skills required for higher education of achievement rather than the compensation for the gender discrimination brought by the better education of individuals. A novel contribution of this study is the examination of the degree to which the gender wage gap varies across the different levels of education. The results reveal a decreasing trend in total male/female wage inequality with increasing level of education. This consequence is manifested in the Blinder-Oaxaca decomposition analysis as well. The education-related downtrend of discrimination effects against women has been found in nine of these countries with the OLS estimates. After the sample selection bias adjustment, only one country (Kenya) shows no consistent education-related trend in the discrimination effect. Thus, the study verifies our hypothesis that education has a promotion effect on social equality in some developing countries, since women are more likely to be treated equally in terms of salary or wages with better education. In terms of the gender wage gap decomposition based on vocational and general education programs, it is hard to distinguish which type of education program is better in reducing the gender discrimination against women, as most of the countries display significant yet irregular discrimination effects on the gender wage differentials.

Chapter 2. The Public-Private Wage Differential and Gender Discrimination

2.1. Introduction

The gender wage gap has been intensively studied by researchers since the early 1990s, as women are paid universally less than men in the worldwide labor markets, even though the inequality trend has been reduced in many economically advanced nations (Blau and Kahn, 2008; Blau and Kahn, 2016). However, the gender wage gap has been shown to be inconsistent in different sectors, especially in the public and private sectors. Many studies have been carried out to examine the extent of male/female wage inequality in each sector and many suggest that the gender wage gap is much smaller in public sectors compared with that in private sectors (Jurajda, 2003; Hyder and Reilly, 2005; Panizza and Qiang, 2005; Cho and Song, 2010; Hospido and Moral-Benito, 2016). However, the US shows the larger gender wage differential in the public sector (Mandel and Semyonov, 2014).

In this study we decompose the public-private sector wage gap and also the gender wage gap in both public and private sectors of twelve developing countries (Armenia, Bolivia, China, Colombia, Georgia, Ghana, Kenya, Laos, Macedonia, Sri Lanka, Ukraine and Vietnam), and compare the public sector premium between women and men, as well as gender wage discrimination between public and private sectors. More specifically, we answer three questions: (i) Is there a public sector premium for male or female? (ii) Is there a gender wage gap in the public sector or private sector? (iii) Are there differences between the public and private sectors in gender wage gaps? To decompose the endowment effect and unexplained effect in the wage gap, we apply the Blinder-Oaxaca decomposition and the Neumark (1988) decomposition on data from the STEP Skills Measurement Household Survey (World Bank, 2012). The study focuses on a data sample of both employed and unemployed individuals. Self-employed workers are excluded, as the determinants of self-employed earnings are not consistent with the wages of other employees (Hundley, 2000). Since the earnings data for the unemployed is missing in our dataset, sample selection bias may exist if we only examine the samples of employees. To adjust for bias, we employ the two stage selection model developed by Lee (1983) and Trost & Lee (1984) and make a comparison of estimations between the basic OLS model and the selection model.

Our findings show that sample selection bias mainly exists in the female wage equations. Most of the countries show a positive public-private pay gap, and the sector wage differential is generally larger for women. The gender wage gap is estimated to be smaller in the public sector than in the private sector, and so is gender discrimination against women.

The paper is organized as follows. Section 2 presents a literature review of studies on the public-private sector wage gap as well as the gender wage differential in the public and private sectors. Section 3 describes the data sources, sample selection and sample statistics. In Section 4, we summarize the methodology of gender wage differential analysis. In Section 5, we estimate the basic wage equation with the gender and sector dummy variables and decompose the public-private sector wage gap. In Section 6, we provide an analysis of the choice of employment and the decomposition of the gender wage gap in both the public and private sectors. Conclusions are stated in section 7.

2.2. Literature Review

The earliest study using a wage differential decomposition was conducted by Oaxaca (1973), in which the effects of gender discrimination were decomposed from the total gender wage differential, using the data from 1967 Survey of Economic Opportunity in the U.S. The estimated form is described as “the residual left after adjusting the gender differential for differences in various characteristics”. His result shows that the effects of discrimination give rise to a substantial proportion of gender wage inequality. Blinder (1973) provides a more structured form of wage inequality for not only the gender group division but also the race (white/black) group division. In his study, the wage gap between the high- income group and low-income group can be described by two parts. One is estimated as “the value of the advantage in endowments possessed by the high-wage group as evaluated by the high-wage group's wage equation”; and another one is described as “the difference between how the high-wage equation would value the characteristics of the low-wage group and how the low wage equation actually values them”. Based on this theoretical frame work, his results show that the gender wage differential is completely caused by gender discrimination.

The Blinder-Oaxaca decomposition of the gender wage gap has been extended by several wage studies. Brown (1980) emphasizes the effects of occupational segregation by adding the “fraction parameters” of the employees in each occupation; Neumark (1988) suggests the non-discrimination wage structure should be estimated by pooled female/male samples, while the Oaxaca (1973) approach considers the male wage structure as the no-discrimination structure; Juhn (1991) and Wellington (1993) provide intertemporal decompositions which can decompose the variations of gender wage inequality by time trend. The main difference among these decomposition methods is: the unexplained gender wage gap from the Juhn (1991) decomposition is estimated by the multiplication between standard deviations of the residual and the standardized residual from the gender wage regression, while for the Wellington (1993) decomposition, the changes in the unexplained gender wage differential over time are examined by the variations of coefficients from both male and female wage regressions. All of these decomposition methods are extensively used by recent wage studies.

Besides the study on gender wage gap, these decomposition methods are also applied to analyze the wage differential between the public and private sectors. Mueller (1998) estimated the size of the public sector wage premium in Canada, using the Blinder-Oaxaca decomposition. He found that public sector employees tended to be paid a wage premium on average compared to those in the private sector, and the premium is uniformly higher for females. Hyder and Reilly (2005) also suggest that public sector workers in Pakistan tend to have higher average pay, and that education levels are likely to be higher than that of private sector workers. Meanwhile, the gender wage gap is also shown to be smaller than that in private sectors. This result is consistent with our findings for most of the twelve developing countries in our study. In the Ma (2015) study, the public-private sector wage gap was estimated to decrease over time in China, but human capital such as education and working experience are shown to have an increasing impact on the public-private sector wage. Hospido and Moral-Benito (2016) develop a study of the public sector wage gap while controlling for skill levels and contract types. The contract types are not often involved in other studies. They found the public-private sector raw wage gap is in general decreasing with a permanent contract, but increasing with a temporary contract for males. In addition, the positive public sector premium is found to decrease when accounting for observed characteristics for both males and females.

Furthermore, the comparison of the gender wage differential between public and private sectors is also of concern to many researchers. Jurajda (2003) provide a detailed decomposition of the gender wage gap in both public and private sectors with the matched employer-employee data sets from the Czech Republic and Slovakia. He found that female wages are about 30% lower than male wages in the Czech Republic, and a substantial part of the gap is attributable to differences in educational attainment of men and women. The gender wage gap is lower in Slovakia, particularly in the public sector. In the Panizza and Qiang (2005) study, they also found significant gender wage gaps in both public and private sectors. But their data suggest that the gender differential in the private sector is higher than that in the public sector in most countries. Meanwhile female workers are also found to enjoy a relatively higher public sector premium than men. Tansel (2005) introduces a multinomial logit model to adjust the selection bias in the wage regressions of Turkey, an adjustment that is usually ignored by many studies. He suggests the advantages of the public sector wage are observed for both women and men, except at the university level. The gender wage differential is only significant in private sector, which implies women tend to experience more gender discrimination in the private sector.

For the studies of developed countries, a large gender wage differential is found in the US labor market, especially in the public sectors, although it has declined over time (Mandel and Semyonov, 2014). The working hours were shown as the dominant factor accounting for the gender pay gap, followed by occupational segregation. However, human capital resources were not found to have a significant effect on the gender wage gap in either the public or private sectors. Cho and Song (2010) compare the gender wage gap in the public and private sectors in Korea with those in the US. They indicate that there is a significant advantage in the public-sector wage in Korea, and the gender wage differential is much wider in the private sectors. The study suggests that the reason for a much lower gender wage gap in the public sector is attributed to female workers' self-selection into public-sector jobs with higher levels of human capital.

Table 2.1 reports the sample country, data resources, decomposition methods and raw gender wage gap of selected studies. In this study, we examine the public sector premium and the gender wage differential for both public and private sectors in twelve developing countries, most of which have not been studied by other researchers. The wage equations are enhanced by the two-stage selection model to deal with possible selection bias on choices of being employed by the public or private sector or non-participating in employment (Lee, 1983; Trost and Lee, 1984; Lassibille, 1998; Tansel, 2005). As the dataset is only from the single year survey and no time trend is included, we will employ the classic Blinder-Oaxaca and Neumark decompositions and selection model to examine the gender wage inequality for both the public and private sectors in twelve developing countries.

Table 2. 1 Selected studies on public- and private- gender wage gap

Study	Country	Data Resources	Estimation Techniques	Raw Wage Gap (logs)
		Studies on public-private wage gap[a]		
Mueller (1998)	Canada	1990 LMAS	OLS and quantile estimation, and Blinder-Oaxaca decomposition	Male: 0. 024 Female: 0.081
Hyder and Reilly (2005)	Pakistan	2001-2002 Pakistan Labor Force Survey	Heckman selection quantile and Blinder-Oaxaca decomposition	0.399
Ma (2015)	China	1995 and 2007 CHIP	Heckman selection model and Blinder-Oaxaca decomposition	1995: 0.283 2007: 0.291
Hospido and Moral-Benito (2016)	Spain	2005-2012 MCVL	Quantile regression and Blinder-Oaxaca decomposition	Male: 0. 349 Female: 0.401
		Studies on gender wage gap by sector[b]		
Jurajda (2003)	Czech and Slovakia	1998 Information System on Average Earnings	WLS estimation and Blinder-Oaxaca decomposition	Czech public: 0.241 private: 0.297
Tansel (2005)	Turkey	1994 Household Expenditure Survey	Multinomial logit model and Blinder-Oaxaca decomposition	Public: 0.003 Private: 0.273
Panizza and Qiang (2005)	13 Countries in Latin America	2001 Inter-American Development Bank	OLS estimation, Neumark and Blinder-Oaxaca decomposition	Bolivia Public: 0.147 Private: 0.119

Cho and Song (2010)	Korea and US	2005 PSID and KLIPS	Selection model and Juhn (1991) decomposition	Korea Public: 0.280 Private: 0.300
Mandel and Semyonov (2014)	United States	1970-2010 IPUMS	Blinder-Oaxaca decomposition	2010 Public: 0.810 Private: 0.711

[a] Mean difference in log hourly wage between public and private sector.
[b] Mean difference between male and female log hourly wage in public and private sectors.

2.3. Data Description

Data applied in this study are collected from the STEP Skills Measurement Household Survey conducted by the World Bank (2012) in twelve developing countries, including the Yunnan city of China, Armenia, Bolivia, Colombia, Georgia, Ghana, Kenya, Lao PDR, Macedonia, Sri Lanka, Ukraine and Vietnam. The surveys were separated in two waves (2012 and 2013). The first wave includes the countries: Lao PDR, Sri Lanka, Bolivia, Colombia, Yunnan of China, Vietnam and Ukraine, while the second wave contains Armenia, Kenya, Georgia, Ghana and Macedonia.

2.3.1. Sample selection

The ages of individuals included in our sample range from 15 to 64, in order to exclude people who could be children or retired. In fact, the retirement age varies in different countries. Georgia and Bolivia have the oldest official retirement age for men, which is 65 years old, while women can retire at the age of 60. Armenia's official retirement age is 63 for both men and women. In China, men can generally retire at 60 years, and women at 50. These retirement ages are only enforced in the public sector, but sometimes can be extended for special occupations, such as government positions or professional occupations. Actually, a large proportion of men and women continue to work beyond the age of 60. According to our data sample, all the countries have wage employees in the 60-64 age group except Kenya. This may be caused by Kenya's limited sample size.

The individuals in our sample data are separated into three groups: public-sector employees, private-sector employees, and non-participants. Self-employed and full-time students are excluded as their wage determinants are different from those of typical employees (Hundley, 2000). The details of sample selection are given in Table 2.2. The total sample size is 27,078, in which 16,519 individuals are women, and 10,559 are men. For most of the countries, the survey samples have more non-participants than wage employees except for Yunnan of China, Bolivia and Vietnam. Therefore, there may be sample selection bias when we estimate the earnings function with OLS using only wage employee data, especially for the female wage equation, since the choices of being employed by the public sector, private sector or non-participating might not be random and might be determined by personal characteristics (Lassibille, 1998; Tansel, 2005).

Table 2. 2 Sample selection, by country

ID	Country	Work Status[a]	Female	Male	Total
CH	Yunnan, China	Public sector	216	215	431
		Private sector	298	312	610
		Non-participants	486	292	778
AM	Armenia	Public sector	397	164	561
		Private sector	152	133	285
		Non-participants	1484	439	1923
BO	Bolivia	Public sector	101	76	177
		Private sector	345	373	718
		Non-participants	499	231	730
CO	Colombia	Public sector	39	41	80
		Private sector	398	426	824
		Non-participants	661	246	907
GE	Georgia	Public sector	297	117	414
		Private sector	200	147	347
		Non-participants	1433	619	2052
GH	Ghana	Public sector	83	156	239

		Private sector	188	326	514
		Non-participants	559	349	908
KE	Kenya	Public sector	55	99	154
		Private sector	431	731	1162
		Non-participants	1013	517	1530
LA	Laos	Public sector	120	173	293
		Private sector	149	159	308
		Non-participants	541	252	793
MKD	Macedonia	Public sector	288	290	578
		Private sector	365	402	767
		Non-participants	1330	854	2184
LK	Sri Lanka	Public sector	152	177	329
		Private sector	179	385	564
		Non-participants	1187	237	1424
UA	Ukraine	Public sector	346	120	466
		Private sector	254	196	450
		Non-participants	776	307	1083
VN	Vietnam	Public sector	343	246	589
		Private sector	382	338	720
		Non-participants	772	414	1186
Total			16519	10559	27078

[a] Non-participants include home workers and individuals who did not work at all during the preceding week of survey.

2.3.2. Sample statistics

The sample statistics for wage employees are reported in appendix Table A.4. For most of the countries, the sample involves more male wage employees than female, although females outnumber males in the full dataset. More employees work in the private sectors except in the countries of Armenia, Georgia and Ukraine. In Colombia, only 8.8% wage employees are from public sectors.

The hourly wage is standardized in US dollars for each country. We find that workers in Armenia have the highest average hourly wage (which is 6.5 dollars), and Yunnan of China has the lowest average wage at 1.90 dollars. The average ages of the employees in Armenia, Georgia, Macedonia and Ukraine are the oldest (averaging more than 40 years) in this data sample. When it comes to education, the average years of education are more than 9 years in all these country samples, which suggests the average level of education should be more than a lower secondary education (or middle school). The average years of education in Georgia are more than 15 years, which is longest among the twelve countries. This phenomenon may be related to the national education policy. For example, a policy of nine years compulsory education is implemented in China, which allows children to receive an elementary and middle school education for free.

For another important characteristic- working occupation- we separate the positions into five groups: managers, professional workers, clerical support workers, service and sales workers, and other occupation workers. The other occupation group contains the workers from skilled agricultural, craft and related trades, plant and machine operation and some other sectors where only low-skilled workers required. As we can see from appendix Table A.4, in most of the countries professional workers account for a relatively higher proportion of the observations than clerical and service workers, and only a very small percentage of individuals are designated as managers. In addition, the table also shows that negative asset wealth is predominant except in China, Armenia, Ghana, Kenya, and Laos.

Except for the indicators discussed above, we also have variables such as working experience (number of months in current job), training experience, working contract, industrial or government certificate in skills, and marital status to describe some other aspects of human capital (Albrecht et al, 2009). At the same time, the variables "head of family", "number of children under 6", "health status (has a chronic illness)" and "marital status" are selected to determine the possibility of being public- or private- sector employees or non-participating (Tansel, 2005; Ahmed and McGillivray, 2015).

2.4. Econometric Methodology

2.4.1. Wage equation and specification

According to the Mincer earnings function (Mincer, 1974), it is conventional to specify the wage equation with log wages and a set of earnings-determining characteristics. The dependent variable used in our wage estimation is specified as the natural log of hourly earnings. The independent variables include controls for human capital and demographic variables, such as age, working experience, education, contract, marriage, skill certificate, training and occupations. The wage equation is specified as

$$lnwage_{ip} = \beta_{0ip} + \beta_{1ip}age + \beta_{2ip}age^2 + \beta_{2ip}age^3 + \beta_{ip}X_{ip} + \epsilon_{ip} \qquad (1)$$

where i indicates the gender, and p represents public or private sectors. X_{ip} describes the vector of human capital and demographic variables including education, work experience, certificate, training, contract, occupation, marital status, occupation and asset wealth.

The age variable and its quadratic have often been used in the standard human capital wage specification to substitute for the potential working experience (Hughes and Maurer-Fazio, 2002). But this has been shown to be less accurate for females than males. For our study, we also include a cubic age term and working experience variables, as the dependent variable is not strictly concave in age. The working experience variable in the wage equation only accounts for experience in the current job, so it cannot fully capture the impact of labor market experience on wages.

For another essential determinant of the human capital wage specification, education is indicated by "years of education" in this study, to avoid introducing noise into the measurement of education compared with the use of dummies of highest completed education (Pham and Reilly, 2007). We also add an asset wealth index in the wage equation, which summarizes the standard living that could affect individual earning as an important external determinant. Other characteristics involved in our wage equation are captured by the dummy variables of marital status, employment contract, industry- or government- recognized certificate, training, and occupation types.

According to the sample selection displayed in Table 2.2, we suggest public- and private- sector employees may not be a random subset in the data sample, but are determined by terms of observables and unobservables compared to people who are not employed (Tansel, 2005). To correct the selection bias caused by non-randomly distributed observations, we apply the standard two-stage selection model developed by Lee (1983) and Trost & Lee (1984) to estimate the wage equation. In the first stage, we apply the multinomial logit model to estimate the probability of being employed in the public sector or private sector with instrumental variables including the number of children under 6 years old, health status and relationship with household head. This process is performed for men and women separately as following:

$$P_j = \frac{\exp\,(Z_i \gamma_{ij} + \varepsilon_{ij})}{\sum_j \exp\,(Z_i \gamma_{ij} + \varepsilon_{ij})} \qquad (2)$$

where i donates male or female, and j indicates the working status including employment with public sector (j = 2), employment with private sector (j = 1) and non-participating in employment (j = 0). The non-participant group is assigned as the reference category while others are the alternative choices. Z_{ij} represents the vectors of instrumental variables that can determine the conditions of being employed.

In the second stage, the wage equation

$$ln\,(wage)_{ij} = X_{ij}\beta_j + \mu_j \lambda_{ij} + w_{ij} \qquad (3)$$

is estimated by OLS for each country by gender, where $ln\,(wage)_{ij}$ is log hourly wage, X_{ij} represents the vector of exogenous variables of human capital, and λ_{ij} denotes the inverse Mill's ratio that implies the unobservables in the first stage.

$\lambda_{ij} = \phi(H_j)/P_j$, where $H_j = \Phi^{-1}(P_j)$, and $\mu_j = -\rho_j\sigma_j$

ρ_j is the correlation between ε_{ij} and ϵ_{ip}, and σ_j indicates the adjusted standard error for the wage equation regression. If the coefficient ρ_j is significantly different from zero, then it means the unobservable factors in the selection model are correlated with the unobservables in the second stage (which implies selection bias).

2.4.2. Blinder-Oaxaca decomposition

Firstly, we perform the well-known Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) at the means to split the total wage differential based on gender and then again for the of public-private employment sectors. Two components are identified: the explained gap, also called the "endowment effect", attributable to a corresponding differential in observable characteristics of human capital, demographic variables and the residual part between male and female (or public and private sectors) returns to these characteristics (Hughes and Maurer-Fazio, 2002). The latter part is considered to be the component of the wage differential that is generally attributed to the unexplained gap known as gender discrimination (or public sector premium) in unobservable characteristics. Here, we define D_{G_OLS} as the total differential between the expected male and female wages estimated by the wage equations with OLS, and D_{P_OLS} as the total differential between public and private sectors. Then the total gender wage gap can be described by the equation:

$$D_{G\_OLS} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_m + \bar{X}_f(\hat{\beta}_m - \hat{\beta}_f) \qquad (4)$$

and

$$D_{P\_OLS} = \overline{lnwage}_{Pub} - \overline{lnwage}_{pri} = \bar{X}_{pub}\hat{\beta}_{pub} - \bar{X}_{pri}\hat{\beta}_{pri}$$
$$= (\bar{X}_{pub} - \bar{X}_{pri})\hat{\beta}_{pub} + \bar{X}_{pri}(\hat{\beta}_{pub} - \hat{\beta}_{pri}) \qquad (5)$$

where $\hat{\beta}_m$ and $\hat{\beta}_f$ are the OLS estimators from the male and female wage equations respectively, while $\hat{\beta}_{pub}$ and $\hat{\beta}_{pri}$ are the estimators from the public and private sector wage equations. The item $(\bar{X}_m - \bar{X}_f)\hat{\beta}_m$ or $(\bar{X}_{pub} - \bar{X}_{pri})\hat{\beta}_{pub}$ indicate the explained element of the wage differential attributable to the gap in observed characteristics. The formula $(\hat{\beta}_m - \hat{\beta}_f)$ and $(\hat{\beta}_{pub} - \hat{\beta}_{pri})$ represents the unexplained components caused by gender discrimination and the public sector premium in unobserved characteristics respectively.

After the adjustment of sample selection bias, the decomposition frame of the gender wage differential is transformed to

$$D_{G\_Heck} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_m + \bar{X}_f(\hat{\beta}_m - \hat{\beta}_f) + (\hat{\mu}_m\bar{\lambda}_m - \hat{\mu}_f\bar{\lambda}_f) \qquad (6)$$

The item $(\hat{\mu}_m\bar{\lambda}_m - \hat{\mu}_f\bar{\lambda}_f)$ comes from the differences in the average selection bias, and will be treated as an additional effect of the unobserved characteristics on gender wage inequality (Ahmed and McGillivray, 2015).

2.4.3. Neumark decomposition

The main difference between the Neumark (1988) and Blinder-Oaxaca decomposition is the choice of a "no-discrimination wage structure". In the

Neumark (1988) study, the no-discriminatory wage structure was obtained using the estimates from a pooled male-female wage regression, while in the Blinder-Oaxaca decomposition it was estimated with the coefficients from the male wage regression. According to the Neumark (1988) decomposition, the total wage differential could be decomposed into three components: the endowment effect attributable to differences in observed characteristics; the unexplained gap representing the wage advantage accruing to men; and the discrimination against women showing the female wage disadvantage. The Neumark decomposition could be written as

$$D_{G\_OLS} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_p + \bar{X}_m(\hat{\beta}_m - \hat{\beta}_p) + \bar{X}_f(\hat{\beta}_p - \hat{\beta}_f) \qquad (7)$$

where $\hat{\beta}_p$ is the OLS estimator from the pooled male-female wage equation. The item $(\bar{X}_m - \bar{X}_f)\hat{\beta}_p$ indicates the endowment effect that can be explained by the gender gap of observed characteristics. $\bar{X}_m(\hat{\beta}_m - \hat{\beta}_p) + \bar{X}_f(\hat{\beta}_p - \hat{\beta}_f)$ represents gender discrimination using the sum of the male wage advantage related to the no-discrimination wage structure and the female wage disadvantage.

The Neumark (1988) decomposition after the selection bias adjustment is processed as

$$D_{G\_Adj} = \overline{lnwage}_m - \overline{lnwage}_f = \bar{X}_m\hat{\beta}_m - \bar{X}_f\hat{\beta}_f$$
$$= (\bar{X}_m - \bar{X}_f)\hat{\beta}_p + \bar{X}_m(\hat{\beta}_m - \hat{\beta}_p) + \bar{X}_f(\hat{\beta}_p - \hat{\beta}_f)$$
$$+ (\hat{\mu}_m\bar{\lambda}_m - \hat{\mu}_f\bar{\lambda}_f) \qquad (8)$$

The value of item $(\hat{\mu}_m\bar{\lambda}_m - \hat{\mu}_f\bar{\lambda}_f)$ is the equivalent to that of the Blinder-

Oaxaca decomposition after the selection bias adjustment.

2.5. Public sector premium

2.5.1. Public-private wage differential

In this section, we begin with the basic wage equations, controlling for gender and public-private dummy variables. The wage equations are described as

$$lnwage = \theta G + \eta P + \omega GP + \epsilon \qquad (9)$$

$$lnwage = \beta X + \theta G + \eta P + \omega GP + \epsilon \qquad (10)$$

where G is a gender dummy that equals 1 for male employees, P donates a dummy that takes value 1 if individuals are employed in the public sectors. GP is the interaction term between gender dummy and public sector dummy variables, and X is a vector of human capital and demographic variables. Equation (9) provides us with the estimates for the raw wage gap by both gender and public-private sector, while Equation (10) gives the estimates of the conditional wage gap controlling for personal characteristics, and the estimates of dummy variables can imply the public sector premium and gender discrimination. Generally, the estimated parameters can be interpreted as: $\theta = lnw_{m_{pri}} - lnw_{f_{pri}}$ (gender wage differential in private sector); $\eta = lnw_{f_{pub}} - lnw_{f_{pri}}$ (public sector premium for women); $\omega = \left(lnw_{m_{pub}} - lnw_{f_{pub}}\right) - (lnw_{m_{pri}} - lnw_{f_{pri}})$ (difference in gender wage gap between public and private sectors); $\theta + \omega = lnw_{m_{pub}} - lnw_{f_{pub}}$ (gender wage gap in public sector); $\eta + \omega = lnw_{m_{pub}} - lnw_{m_{pri}}$ (public sector premium for men). The estimated results of parameters are displayed in Table 2.3.

Considering the raw wage differential, the first two columns of panel A report the public-private sector pay gap for men and women respectively. Most of the countries show a positive public-private pay gap except Armenia and Laos. It reveals a significantly negative public-private wage gap for males but insignificant wage gap for females in Laos. Ghana and Kenya are shown to have the largest significant wage gap between the two sectors for both men and women. The public sector wages are estimated to be over 100% larger than the private sector wages in these two countries. In addition, the public-private wage differential for women is generally larger than that for men, except in four countries including China, Armenia, Ukraine and Vietnam. In terms of the raw gender wage gap, gender inequality is more likely to happen in the private sector, as all the countries, except China, reveal a significant gender wage gap for private sector employees. In contrast, the gender wage gap is only significant in the public sectors in Armenia, Georgia, Ukraine and Vietnam.

With controls for individual characteristics, public sector advantages are weakened for both men and women in all countries (also seen in Hospido and Moral-Benito, 2016). In Bolivia, Laos, Sri Lanka and Vietnam even reveal a significant public-sector wage penalty for men. The public-sector premium for women becomes less significant in seven countries including China, Bolivia, Colombia, Georgia, Ghana, Sri Lanka and Vietnam. Thus, only three countries including Colombia, Ghana and Macedonia show a significant public sector premium for both women and men. After controlling for personal characteristics, China, Macedonia and Sri Lanka also exhibit significant gender discrimination against women in public sectors, even though the raw gender wage gap is insignificant in these countries. The private sector is more likely to have gender wage discrimination against women, compared with the public sector. Only Ukraine shows a positive and significant difference in gender discrimination between public and private sectors.

However, the estimates for public sector premium and gender discrimination in this section are econometrically problematic, since the effects of sector and gender are estimates as "intercept" effects by equation (10) when restrict the equal wage structure for both male-female and public-private sectors. With our assumptions of existence of public sector premium and gender discrimination, we suggest the wage structures are different by sector and gender. Therefore, in next section, we apply both Blinder-Oaxaca and Neumark decompositions to analyze the wage differential for public and private sectors.

Table 2. 3 Raw wage gap and conditional wage gap based on OLS estimation, by country[a]

	Panel A[b]					Panel B[b]				
	Public-private pay gap		Gender pay gap		Difference in gender pay gap	Public sector premium		Gender discrimination		Difference in gender pay gap
	Men	Women	Public	Private		Men	Women	Public	Private	
	$\eta+\omega$	η	$\theta+\omega$	θ	ω	$\eta+\omega$	η	$\theta+\omega$	θ	ω
China	0.389***	0.298***	0.067	-0.024	0.090	0.099*	0.074	0.122**	0.097**	0.025
	(0.056)	(0.050)	(0.055)	(0.051)	(0.079)	(0.051)	(0.051)	(0.053)	(0.046)	(0.069)
Armenia	-0.034	-0.038	0.272***	0.269***	0.003	-0.139*	-0.190**	0.316***	0.265***	0.052
	(0.085)	(0.073)	(0.055)	(0.086)	(0.109)	(0.084)	(0.076)	(0.068)	(0.086)	(0.107)
Bolivia	0.208*	0.675***	-0.109	0.358***	-0.467***	-0.278***	0.110	-0.149	0.239***	-0.388***
	(0.110)	(0.092)	(0.129)	(0.065)	(0.148)	(0.105)	(0.097)	(0.116)	(0.058)	(0.130)
Colombia	0.665***	0.761***	0.180	0.276***	-0.096	0.246**	0.282**	0.195	0.232***	-0.036
	(0.122)	(0.130)	(0.198)	(0.052)	(0.174)	(0.113)	(0.116)	(0.149)	(0.049)	(0.157)
Georgia	0.078	0.168**	0.264***	0.354***	-0.090	0.038	-0.048	0.414***	0.329***	0.086
	(0.097)	(0.072)	(0.085)	(0.085)	(0.120)	(0.086)	(0.070)	(0.079)	(0.078)	(0.108)
Ghana	0.715***	0.937***	0.118	0.340***	-0.222	0.253***	0.299**	0.075	0.121	-0.046

	(0.103)	(0.147)	(0.145)	(0.097)	(0.173)	(0.098)	(0.130)	(0.126)	(0.089)	(0.153)
Kenya	0.803***	1.143***	-0.186	0.155***	-0.341*	0.027	0.336***	-0.192	0.117**	-0.309**
	(0.106)	(0.141)	(0.166)	(0.060)	(0.176)	(0.089)	(0.118)	(0.132)	(0.049)	(0.140)
Laos	-0.186**	-0.016	0.125	0.294***	-0.169	-0.434***	-0.208*	0.104	0.330***	-0.227*
	(0.086)	(0.098)	(0.082)	(0.089)	(0.129)	(0.106)	(0.115)	(0.096)	(0.088)	(0.131)
Macedonia	0.402***	0.470***	0.026	0.093**	-0.067	0.198***	0.151***	0.194***	0.147***	0.047
	(0.043)	(0.044)	(0.041)	(0.040)	(0.062)	(0.038)	(0.041)	(0.039)	(0.034)	(0.052)
Sri Lanka	0.109	0.582***	0.014	0.487***	-0.473***	-0.208**	0.051	0.223**	0.483***	-0.260**
	(0.077)	(0.096)	(0.090)	(0.077)	(0.122)	(0.081)	(0.102)	(0.092)	(0.073)	(0.116)
Ukraine	0.162***	0.022	0.450***	0.310***	0.140*	0.177***	-0.061	0.506***	0.267***	0.239***
	(0.060)	(0.040)	(0.056)	(0.049)	(0.073)	(0.056)	(0.041)	(0.053)	(0.047)	(0.068)
Vietnam	0.267***	0.257***	0.181***	0.171***	0.010	-0.135**	-0.109*	0.172***	0.198***	-0.027
	(0.069)	(0.065)	(0.067)	(0.062)	(0.093)	(0.067)	(0.060)	(0.063)	(0.055)	(0.082)

[a] A positive entry indicates an advantage in favor of public sector and men.
[b] Panel A displays the raw log wage differential and panel B describes the conditional log wage gap with the control for X variables.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

2.5.2. Blinder-Oaxaca and Neumark decomposition

The Blinder-Oaxaca and Neumark decomposition results are displayed in Table 2.4. As we can see, the total wage gaps between public and private sectors for women and men are completely consistent with the estimates of parameters η and $\eta + \omega$ in panel A of Table 2.3. Generally, the total sector wage differentials of women are larger than those of the male group in most of the countries, except in China, Armenia, Laos, Ukraine and Vietnam. Armenia did not show a significant sector wage difference for either men or women. Laos exhibits a significant wage advantage in the private sector for males, but an insignificant differential for females.

When it comes to the Blinder-Oaxaca decomposition of the sector wage gap, most of the countries show positive and significant endowment effects on the sector wage gap for both men and women, except in Laos and Ukraine. This suggests working in the public sector may require more valuable personal characteristics that could be captured by these human capital and demographic variables. However, the results of public sector premium estimations are not consistent between males and females for most of the countries. Six countries including China, Colombia, Ghana, Kenya, Laos and Macedonia, show a positive and significant public sector premium for women, but no evidence that men experience a public sector premium in Kenya and Laos. Although there are also six countries that exhibit a significant public sector premium for men, the countries are not completely consistent with respect to women. The Neumark decomposition displays almost consistent estimates with the Blinder-Oaxaca decomposition, except in Bolivia and Laos.

Table 2. 4 Decomposition of the public-private raw wage differential, by country[a]

Country	Female					Male				
	Blinder-Oaxaca		Neumark		Total	Blinder-Oaxaca		Neumark		Total
	Endowment	Premium	Endowment	Premium[b]		Endowment	Premium	Endowment	Premium[b]	
China	0.239***	0.060***	0.221***	0.077***	0.298***	0.319***	0.070***	0.314***	0.075***	0.389***
	(0.032)	(0.011)	(0.028)	[0.000]	(0.050)	(0.033)	(0.012)	(0.032)	[0.000]	(0.061)
Armenia	0.278***	-0.315***	0.092***	-0.130***	-0.038	0.195***	-0.230***	0.071**	-0.105***	-0.034
	(0.026)	(0.030)	(0.022)	[0.000]	(0.073)	(0.042)	(0.030)	(0.036)	[0.000]	(0.075)
Bolivia	0.891***	-0.216***	0.547***	0.128***	0.675***	1.271***	-1.063***	0.461***	-0.253***	0.208*
	(0.088)	(0.032)	(0.049)	[0.000]	(0.092)	(0.148)	(0.045)	(0.062)	[0.000]	(0.118)
Colombia	0.139	0.622***	0.534***	0.227***	0.761***	0.371***	0.294***	0.463***	0.202***	0.665***
	(0.230)	(0.072)	(0.068)	[0.000]	(0.130)	(0.109)	(0.029)	(0.059)	[0.000]	(0.117)
Georgia	0.171***	-0.003	0.188***	-0.020**	0.168**	0.011	0.067**	0.031	0.047**	0.078
	(0.030)	(0.016)	(0.033)	[0.019]	(0.069)	(0.048)	(0.034)	(0.060)	[0.021]	(0.104)
Ghana	0.685***	0.252***	0.778***	0.160***	0.937***	0.405***	0.310***	0.486***	0.229***	0.715***

	(0.094)	(0.023)	(0.095)	[0.000]	(0.147)	(0.054)	(0.026)	(0.051)	[0.000]	(0.100)
Kenya	0.630***	0.513***	0.902***	0.241***	1.143***	0.847***	-0.044***	0.788***	0.015	0.803***
	(0.090)	(0.020)	(0.091)	[0.000]	(0.146)	(0.080)	(0.016)	(0.068)	[0.156]	(0.104)
Laos	-0.227***	0.211***	0.099**	-0.115***	-0.016	0.016	-0.202***	-0.070***	-0.115***	-0.186**
	(0.040)	(0.056)	(0.045)	[0.000]	(0.098)	(0.024)	(0.016)	(0.023)	[0.000]	(0.085)
Macedonia	0.356***	0.114***	0.403***	0.067***	0.470***	0.187***	0.215***	0.220***	0.182***	0.402***
	(0.027)	(0.009)	(0.028)	[0.000]	(0.044)	(0.022)	(0.007)	(0.025)	[0.000]	(0.043)
Sri Lanka	0.596***	-0.014	0.585***	-0.003	0.582***	0.286***	-0.177***	0.213***	-0.104***	0.109
	(0.056)	(0.033)	(0.045)	[0.842]	(0.096)	(0.037)	(0.015)	(0.029)	[0.000]	(0.077)
Ukraine	0.108***	-0.086***	0.093***	-0.071***	0.022	-0.012	0.174***	-0.013	0.176***	0.162**
	(0.022)	(0.011)	(0.019)	[0.000]	(0.040)	(0.028)	(0.017)	(0.025)	[0.000]	(0.066)
Vietnam	0.322***	-0.065***	0.346***	-0.089***	0.257***	0.286***	-0.020	0.337***	-0.070***	0.267***
	(0.029)	(0.009)	(0.030)	[0.000]	(0.065)	(0.035)	(0.023)	(0.032)	[0.000]	(0.064)

[a] Decomposition at the mean. A positive entry indicates an advantage in favor of public sector.
[b] Robust S.E. in parenthesis and p-values in square brackets.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

2.6. Gender wage differential in public and private sectors

2.6.1. Public and private employment choice

As we describe in the sample selection section, the choice of being employed either in the public sector or the private sector can be determined by a series of instrument variables. The probability estimates are given by multinomial logit models and the results are reported in Table A.5 and Table A.6 in the Appendix, for women and men respectively. The results suggest that women who are married, have more children under the age of 6 or having health problems are not likely to participate in the labor market in most of the sample countries. In particular, the results show larger effects from these characteristics on the choice of working in the private sectors. Due to different labor policies, private companies may require additional working time and generate more pressures on their workers in pursuit of their profit goals. As a result, ceteris paribus, the private sector would be more unfavorable for married women with young kids. The effects of being married on choice of private sector employment are significant in seven countries including Armenia, Bolivia, Colombia, Georgia, Kenya, Sri Lanka and Vietnam. The impact of number of children under the age of 6 is also shown to have more power on the choices of being employed by the private sectors, and six countries exhibit a significant result. On the other hand, only three countries (Armenia, Georgia and Ukraine) display a significant impact on public sector employment choice. This consequence implies that the condition of being married involves something more than just the conflict of childcare or other types of family responsibilities with wage-earning jobs (Ahmed and

McGillivray, 2015). Meanwhile, health condition did not show a strong impact on employment choices. It was only significant in the public sector in Georgia and Ukraine, and in the private sector in Sri Lanka and Vietnam. Being head of the family mainly affects choice of private-sector jobs. Only one country (Ghana) shows a significant effect from that in the public sector.

The positively and significantly larger coefficients of education in the public sector suggest that working in the public sectors may require higher levels of education than working for private companies for both women and men. On the other hand, the effects of education are much smaller for men than women in most of the countries. This suggests that education as an essential element of human capital does not display as important an effect for male workers as for female workers. Moreover, being married exhibits a positive and significant effect on both public and private sectors in several countries, but the impacts of number of children are not shown to be significant in most countries for males.

2.6.2. Wage regression

The estimates of the wage equations by country for women and men are displayed in appendix Table A.7 and Table A.8 respectively. Two estimation methods, OLS and a sample selection model, are employed in this study. The selection model developed by Lee (1983) and Trost & Lee (1984), can check for selection bias by testing the relationship between the residuals of the two stages, and adjusts the error terms of the second stage with the estimated inverse Mill's ratio and coefficients from the second stage (as specified in Eqn. 3). Panel A of Table A.7 reports the OLS estimates for female samples, while Panel B presents the adjusted estimates from the selection model for males in Table A.8.

The impacts of age items are not significant in most of the countries. They are shown to be significant for women in public sectors in Macedonia and Ukraine, and in private sectors in Laos. For the male samples, impacts of age are only significant in both public and private sectors in Vietnam. Education is determined to have a strong impact on wage in most of the countries. A notable finding is that the returns to years of education are evidently larger for women in both public and private sectors in most countries, with the only exceptions being Macedonia and Sri Lanka. In addition, education is shown to have a stronger impact on the public-sector wage for both women and men, a phenomenon also found by Hyder and Reilly (2005) in Pakistan. In terms of working experience, the effect is mainly significant for women in the public sector. But overall, it is not significant in most of countries for either women or men.

With the reference category assigned to "other occupation", the return of each occupation on wage is more significant for the male group, especially in the private sector. The occupations of manager and professional are shown to have the largest returns on individual earnings; however the advantages of these two occupations on wages are not significant in the public sector or for females. Only in Macedonia and Vietnam, do we find a significant return on higher levels of occupations. The service and sales occupations are estimated to have significantly negative returns on wage for all the sample groups in most of the countries.

The impact of having a labor contract is mainly found to be significant in the private sector for both women and men. For male samples, China and Armenia also show a significant contract impact in public sector. In fact, in the samples of Ukraine and Macedonia, all the public sector employees had a labor contract. Having an industry or government certificate does not show a significant impact on employee wages in most of the counties, but overall may work better for females as it exhibits positively significant coefficients in several countries. Similarly, a training experience also shows an advantage for women, particularly in the private sector. The effects of asset wealth index on wage are significant in most countries, but it is hard to find a regular relationship between women and men, or between public and private sectors. The impact of being married did not show a regular rule with the wage equation estimates either.

In terms of sample selection, selection bias is more likely to happen with female samples, as the coefficients of the inverse Mill's ratio are mainly significant in female groups. The results suggest that selection bias exists in China (public), Armenia (public), Bolivia (private), Ghana (private), Macedonia (public), Laos (private) for women, and Armenia (public) and Sri Lanka (public) for men. After the selection-bias adjustment, there are some changes in the coefficient estimates compared with the unadjusted OLS estimates, but the overall pattern is not modified significantly. It is notable that the sample selection adjustment raises the estimates to education for women where there are the significant and positive estimates of the inverse Mill's ratio. This implies that some unobserved factors with positive effects on female employment choices play a positive role in determining their wages.

2.6.3. Gender wage gap decomposition

In this section, we summarize the Blinder-Oaxaca decomposition and Neumark decomposition results for the gender wage differentials in both public and private sectors from the twelve developing countries. The decomposition analyses are processed with both the OLS estimates and the selection-bias adjusted estimates. Columns 1-6 of Table 2.5 show the gender wage gap decomposition with the OLS estimates, such that the positive values indicate an advantage in favor of males. We find that only Yunnan of China shows an insignificant differential on the observed male and female wages in the private sector. However, in the public sector, only Armenia, Georgia, Ukraine and Vietnam display a significant gender wage gap. After the decomposition of gender wage gap, the discrimination effects are found to be significant in the public sector in eight countries with both the Blinder-Oaxaca and Neumark methods, and in Colombia and Ghana with only the Neumark method. Only two countries, Bolivia and Kenya, show no evidence of gender discrimination. Typically, countries with an insignificant gender wage differential but a significant discrimination effect (including China, Macedonia and Sri Lanka) reveal a significant advantage in the human capital endowments of women. This implies that the discrimination on earnings against women was compensated by the advantages of female human capital. The advantage of human capital in women is mainly contributed by their relatively better education, since the education effect on the male/female wage gap is significantly negative in these countries (see Table A.9 in Appendix).

In terms of private sectors, all these countries display a significant discrimination effect on the gender wage differential. But the endowment effect only shows a significant advantage in favor of males in Bolivia, Colombia, Ghana and Ukraine. China exhibits a significantly negative difference in human capital between men and women. For the other countries, no evidence is found for a significant difference in the endowment effect. Comparing the gender wage differential between public and private sectors based on the OLS estimations, we find that female employees in the private sector experience a larger gender wage gap than those in the public sector, except in China, Armenia, Ukraine and Vietnam. Seven countries including Bolivia, Colombia, Ghana, Kenya, Laos, Sri Lanka, and Vietnam are shown to have less gender discrimination in the public sector than in the private sector.

The decomposition based on the selection bias adjustment is reported in columns 7-12 of Table 2.5. The changes brought by the selectivity adjustment on the explained effects are not very substantial, with the exception of public sectors in Laos and Sri Lanka. The values of the endowment effect from the Blinder-Oaxaca decomposition in the public sector of Laos and Sri Lanka are transformed to be positive and significant. The slight changes occurring in other countries are because the estimates of wage equations do not experience a substantial change with the selectivity adjustment. Hence, the variations mainly occur in the magnitude of discrimination effects, but with no consistent pattern. Specifically, the discrimination effect increases in both the public and private sectors in Armenia, Bolivia, Colombia, Macedonia and Vietnam, while it disappears completely in the public sector in Ghana, Kenya and Laos, as well as the private sector in China, Georgia and Ghana. The public sector is shown to have larger gender discrimination compared with the private sector in seven countries, with the exception of Armenia, Kenya, Laos and Vietnam. With increases in the discrimination effect, the selection bias effect is estimated to be negative, which implies that discrimination against women was offset by female advantages embedded in unobserved characteristics. In contrast, decreases in discrimination effects are always accompanied by a positive selection bias effect, so in this situation discrimination against women is exacerbated by unobservables to some extent.

Table 2. 5 Decomposition[a] for gender wage gap in public- and private- sector, by country

	OLS						Selection bias adjusted					
	CH		AM		BO		CH		AM		BO	
	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gender wage gap in public	0.067	0.067	0.272***	0.272***	-0.109	-0.109	0.067	0.067	0.272***	0.272***	-0.109	-0.109
	(0.055)	(0.055)	(0.055)	(0.055)	(0.129)	(0.129)	(0.055)	(0.055)	(0.055)	(0.055)	(0.129)	(0.129)
Endowment effects	-0.095***	-0.059*	-0.026	0.015	0.049	-0.016	-0.161***	-0.148**	-0.036	0.025	0.027	0.029
	(0.034)	(0.032)	(0.028)	(0.024)	(0.110)	(0.078)	(0.054)	(0.057)	(0.022)	(0.020)	(0.096)	(0.117)
Discrimination effect[b]	0.162***	0.126***	0.299***	0.258***	-0.158***	-0.093***	0.530***	0.517***	1.170***	1.109***	2.075***	2.073***
	(0.012)	[0.000]	(0.011)	[0.000]	(0.054)	[0.008]	(0.017)	[0.000]	(0.015)	[0.000]	(0.060)	[0.000]
Selection bias effect	-	-	-	-	-	-	-0.302	-0.302	-0.862	-0.862	-2.211	-2.211
Gender wage gap in private	-0.024	-0.024	0.269**	0.269**	0.358***	0.358***	-0.024	-0.024	0.269**	0.269**	0.358***	0.358***
	(0.054)	(0.054)	(0.111)	(0.111)	(0.066)	(0.066)	(0.054)	(0.054)	(0.111)	(0.111)	(0.066)	(0.066)
Endowment effects	-0.107***	-0.097***	0.010	0.013	0.130***	0.141***	-0.109***	-0.105***	0.016	0.035	0.133***	0.151***
	(0.030)	(0.025)	(0.043)	(0.032)	(0.039)	(0.036)	(0.029)	(0.026)	(0.040)	(0.031)	(0.039)	(0.036)
Discrimination	0.084***	0.074***	0.259***	0.256***	0.228***	0.217***	-0.517***	-0.521***	3.718***	3.699***	0.862***	0.843***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
effect[b]	(0.014)	[0.000]	(0.037)	[0.000]	(0.014)	[0.000]	(0.015)	[0.000]	(0.051)	[0.000]	(0.015)	[0.000]
Selection bias effect	-	-	-	-	-	-	0.602	0.602	-3.465	-3.465	-0.637	-0.636
Δ gap (public-private)	0.091	0.091	0.003	0.003	-0.467	-0.467	0.091	0.091	0.003	0.003	-0.467	-0.467
Δ endowment	0.012	0.038	-0.036	0.002	-0.081	-0.157	-0.052	-0.043	-0.052	-0.01	-0.106	-0.122
Δ discrimination	0.078	0.052	0.04	0.002	-0.386	-0.310	1.047	1.038	-2.548	-2.590	1.213	1.230

[a] Decomposition at the mean. A positive entry indicates an advantage in favor of males.
[b] Robust S.E. in parenthesis and p-values in square brackets.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued 1

	OLS						Selection bias adjusted					
	CO		GE		GH		CO		GE		GH	
	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gender wage gap in public	0.180	0.180	0.264***	0.264***	0.118	0.118	0.180	0.180	0.264***	0.264***	0.118	0.118
	(0.198)	(0.198)	(0.076)	(0.076)	(0.145)	(0.145)	(0.198)	(0.198)	(0.076)	(0.076)	(0.145)	(0.145)
Endowment effects	0.054	-0.006	-0.194***	-0.044	0.057	0.060	0.064	0.130	-0.187***	-0.009	0.020	0.011
	(0.144)	(0.119)	(0.039)	(0.033)	(0.081)	(0.080)	(0.095)	(0.083)	(0.036)	(0.027)	(0.064)	(0.053)

Discrimination effect	0.126	0.186**	0.458***	0.308***	0.062	0.059***	2.129***	2.181***	1.346***	1.168***	-0.057	-0.048***
	(0.142)	[0.025]	(0.015)	[0.000]	(0.044)	[0.009]	(0.154)	[0.000]	(0.020)	[0.000]	(0.045)	[0.000]
Selection bias effect	-	-	-	-	-	-	-2.013	-2.131	-0.895	-0.895	0.155	0.155
Gender wage gap in private	0.276***	0.276***	0.354***	0.354***	0.340***	0.340***	0.276***	0.276***	0.354***	0.354***	0.340***	0.340***
	(0.051)	(0.051)	(0.095)	(0.095)	(0.096)	(0.096)	(0.051)	(0.051)	(0.095)	(0.095)	(0.096)	(0.096)
Endowment effects	0.019	0.067***	0.097	0.082	0.199***	0.249***	0.022	0.063***	0.125	0.108**	0.217***	0.246***
	(0.023)	(0.025)	(0.074)	(0.055)	(0.049)	(0.053)	(0.024)	(0.024)	(0.096)	(0.053)	(0.049)	(0.053)
Discrimination effect	0.257***	0.209***	0.257***	0.273***	0.141***	0.091***	0.523**	0.482***	-1.851***	-1.871***	-1.702***	-1.731***
	(0.008)	[0.000]	(0.030)	[0.000]	(0.023)	[0.000]	(0.008)	[0.000]	(0.047)	[0.000]	(0.038)	[0.000]
Selection bias effect	-	-	-	-	-	-	-0.269	-0.269	2.080	2.117	1.825	1.825
Δ gap (public-private)	-0.096	-0.096	-0.090	-0.090	-0.222	-0.222	-0.096	-0.096	-0.090	-0.090	-0.222	-0.222
Δ endowment	0.035	-0.073	-0.291	-0.126	-0.142	-0.189	0.042	0.067	-0.312	-0.117	-0.197	-0.235
Δ discrimination	-0.131	-0.023	0.201	0.035	-0.079	-0.032	1.606	1.699	3.197	3.039	1.645	1.683

Continued 2

	OLS						Selection bias adjusted					
	KE		LA		MKD		KE		LA		MKD	
	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gender wage gap in public	-0.186	-0.186	0.125	0.125	0.026	0.026	-0.186	-0.186	0.125	0.125	0.026	0.026
	(0.139)	(0.139)	(0.082)	(0.082)	(0.041)	(0.041)	(0.139)	(0.139)	(0.082)	(0.082)	(0.041)	(0.041)
Endowment effects	0.032	0.025	-0.037	0.070***	-0.129***	-0.119***	0.036	0.125	0.126**	0.131***	-0.128***	-0.127***
	(0.102)	(0.083)	(0.027)	(0.026)	(0.023)	(0.024)	(0.106)	(0.226)	(0.057)	(0.043)	(0.023)	(0.025)
Discrimination effect	-0.218***	-0.211***	0.162***	0.055***	0.155***	0.145***	-3.176***	-3.265***	-0.088**	-0.094***	0.734***	0.733***
	(0.067)	[0.000]	(0.033)	[0.005]	(0.008)	[0.000]	(0.159)	[0.000]	(0.036)	[0.000]	(0.017)	[0.000]
Selection bias effect	-	-	-	-	-	-	2.954	2.954	0.087	0.088	-0.580	-0.580
Gender wage gap in private	0.155**	0.155**	0.294***	0.294***	0.093**	0.093**	0.155**	0.155**	0.294***	0.294***	0.093**	0.093**
	(0.061)	(0.061)	(0.098)	(0.098)	(0.044)	(0.044)	(0.061)	(0.061)	(0.098)	(0.098)	(0.044)	(0.044)
Endowment effects	0.023	0.048	-0.020	-0.029	-0.043*	-0.039	0.030	0.052	-0.023	-0.036	-0.033	-0.030
	(0.039)	(0.038)	(0.027)	(0.039)	(0.023)	(0.024)	(0.039)	(0.038)	(0.027)	(0.039)	(0.023)	(0.024)
Discrimination effect	0.132***	0.107***	0.315***	0.324***	0.137***	0.132***	0.482***	0.460***	1.237***	1.250***	0.642***	0.639***
	(0.014)	[0.000]	(0.038)	[0.000]	(0.007)	[0.000]	(0.014)	[0.000]	(0.044)	[0.000]	(0.008)	[0.000]
Selection bias	-	-	-	-	-	-	-0.357	-0.357	-0.920	-0.920	-0.516	-0.516

effect												
Δ gap (public-private)	-0.341	-0.341	-0.169	-0.169	-0.067	-0.067	-0.341	-0.341	-0.169	-0.169	-0.067	-0.067
Δ endowment	0.009	-0.023	-0.017	0.099	-0.086	-0.08	0.006	0.073	0.149	0.167	-0.095	-0.097
Δ discrimination	-0.350	-0.318	-0.153	-0.269	0.018	0.013	-3.658	-3.725	-1.325	-1.344	0.092	0.094

Continued 3

	OLS						Selection bias adjusted					
	LK		UA		VN		LK		UA		VN	
	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark	Oaxaca	Neumark
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gender wage gap in public	0.014	0.014	0.450***	0.450***	0.181***	0.181***	0.014	0.014	0.450***	0.450***	0.181***	0.181***
	(0.090)	(0.090)	(0.056)	(0.056)	(0.067)	(0.067)	(0.090)	(0.090)	(0.056)	(0.056)	(0.067)	(0.067)
Endowment effects	-0.128**	-0.143***	0.030	0.069**	0.0002	0.028	0.067*	-0.093***	0.034	0.104***	0.034	0.036
	(0.051)	(0.049)	(0.028)	(0.027)	(0.035)	(0.031)	(0.039)	(0.032)	(0.027)	(0.022)	(0.060)	(0.059)
Discrimination effect	0.142***	0.157***	0.421***	0.382***	0.181***	0.153***	1.081***	1.241***	0.757***	0.687***	0.415***	0.413***
	(0.021)	[0.000]	(0.016)	[0.000]	(0.015)	[0.000]	(0.046)	[0.000]	(0.017)	[0.000]	(0.018)	[0.000]

Selection bias effect	-	-	-	-	-	-	-1.134	-1.134	-0.341	-0.341	-0.268	-0.268
Gender wage gap in private	0.487***	0.487***	0.310***	0.310***	0.171***	0.171***	0.487***	0.487***	0.310***	0.310***	0.171***	0.171***
	(0.079)	(0.079)	(0.048)	(0.048)	(0.064)	(0.064)	(0.079)	(0.079)	(0.048)	(0.048)	(0.064)	(0.064)
Endowment effects	0.011	0.039	0.049**	0.073***	-0.046	-0.037	0.009	0.025	0.050**	0.073***	-0.037	-0.029
	(0.030)	(0.030)	(0.024)	(0.020)	(0.033)	(0.033)	(0.031)	(0.033)	(0.024)	(0.020)	(0.036)	(0.034)
Discrimination effect	0.476***	0.448***	0.261***	0.237***	0.217***	0.208***	0.364***	0.348***	0.100***	0.077***	0.554***	0.547***
	(0.020)	[0.000]	(0.010)	[0.000]	(0.014)	[0.000]	(0.020)	[0.000]	(0.012)	[0.000]	(0.015)	[0.000]
Selection bias effect	-	-	-	-	-	-	0.114	0.114	0.160	0.160	-0.346	-0.347
Δ gap (public-private)	-0.473	-0.473	0.140	0.140	0.010	0.010	-0.473	-0.473	0.140	0.140	0.010	0.010
Δ endowment	-0.139	-0.182	-0.019	-0.004	0.0462	0.065	0.058	-0.118	-0.016	0.031	0.071	0.065
Δ discrimination	-0.334	-0.291	0.16	0.145	-0.036	-0.055	0.717	0.893	0.657	0.61	-0.139	-0.134

2.7. Conclusion

In this study, we decompose the wage differentials for both gender and public-private sector in twelve developing countries and examine the public-sector premium and gender discrimination in different groups. The wage equations are extended from the Mincer earnings function and estimated separately by gender and sector. Both OLS estimation and a selection model are applied. From the sample described in, our data includes more observations for women but fewer female wage employees. We suggest that sample selection bias may exist in the female wage equations, and the probability of choice of working in the public or private sector is related to household characteristics such as marital status, number of children, health status and so on. The multinomial logit estimation results show that women who are married, having more children under the age of 6 or health problems are not likely to participate in the labor market, especially in private companies. In addition, education as an essential trait of human capital does not display as important an effect for male workers as for female workers. The returns to education in the wage equations are also larger for women in both the public and private sectors in most countries.

For the public-sector premium, we found most of the countries show a positive public-private pay gap, and the sector wage differential for women is generally larger than that for men. However, the public-sector advantages are weakened for both men and women in all the countries after controlling for individual characteristics. Meanwhile, a positive endowment effect in the public-sector wage gap suggests that working in the public sector may require better personal characteristics that are captured by these human capital and demographic variables. Nevertheless, we cannot find a consistent result on the public sector premium for men and women with those two decomposition methods, as the results varied across countries.

Considering the gender wage gap in the public and private sectors, we found that most countries show a significantly positive differential on observed male- female wages in the private sector, except in Yunnan of China. However, only four countries including Armenia, Georgia, Ukraine and Vietnam display a significant gender wage gap in their public sectors. Although few countries were found to have significant gender wage gaps in public sectors, the discrimination effects against women are still estimated to be significant in eight countries for the public sector with both the Blinder-Oaxaca and Neumark methods. Typically, countries (including China, Macedonia and Sri Lanka) with insignificant observed gender wage differentials but significant discrimination effects would reveal a significant advantage in the human capital endowments of women. This implies that the discrimination on earnings against women was compensated by the advantages of female human capital. Comparing the gender wage differential between public and private sectors, we find that female employees in the private sector experience larger gender wage gaps than those in the public sector. The results are given based on OLS estimation, as the selection bias is not significant in most of the countries.

Chapter 3. Residential Water Demand in China: Comparison between Log-linear Demand Equation and EDM System

3.1. Introduction

During the past two decades, water use in China increased approximately 11 percent, and the total water withdraw of China was 618.34 billion cubic meters in 2013 (Figure 3.1). The total water use mainly consists of agricultural water use, industrial water use and residential water use (see Figure 3.2), in which residential water use accounts for the smallest portion (12%) but has the fastest growth. Since 1997, residential water use has increased more than 40 percent with an annual rate of 2.7%. This situation may have a high correlation with the continuous growth of water consumers, because the number of water consumers grows 39.3% after the year of 2004.[1] Consequently, the residential water supply is suffering a burden from the rapid growth of water consumption. The increasing water demand is inconsistent with the capability of water supply in many areas of China. More than 400 cities are experiencing water shortages, and 110 of them are seriously lacking water (Chen and Yang, 2009). During the 1990s, drought annually happened on average to 26.6 million hectares of Chinese land. Chinese residents had to confront 6 billion cubic meters[2] of water scarcity in the cities (Hubacek and Sun, 2007). Therefore, the conflict between increasing water demand and

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[1] All the growth rates are calculated according to the data from National Bureau of Statistics of China (NBSC). http://www.stats.gov.cn/english/Statisticaldata/AnnualData/

[2] One cubic meter (m^3, SI) = 10^3 liters (L) $\approx$ 264.2 gallons.

limitation of water resources is bound to affect both economic development and living quality in China. Based on this situation, analyzing the residential water demand system and knowing how the factors influence residential water consumption appear to be increasingly important to Chinese water management policy.

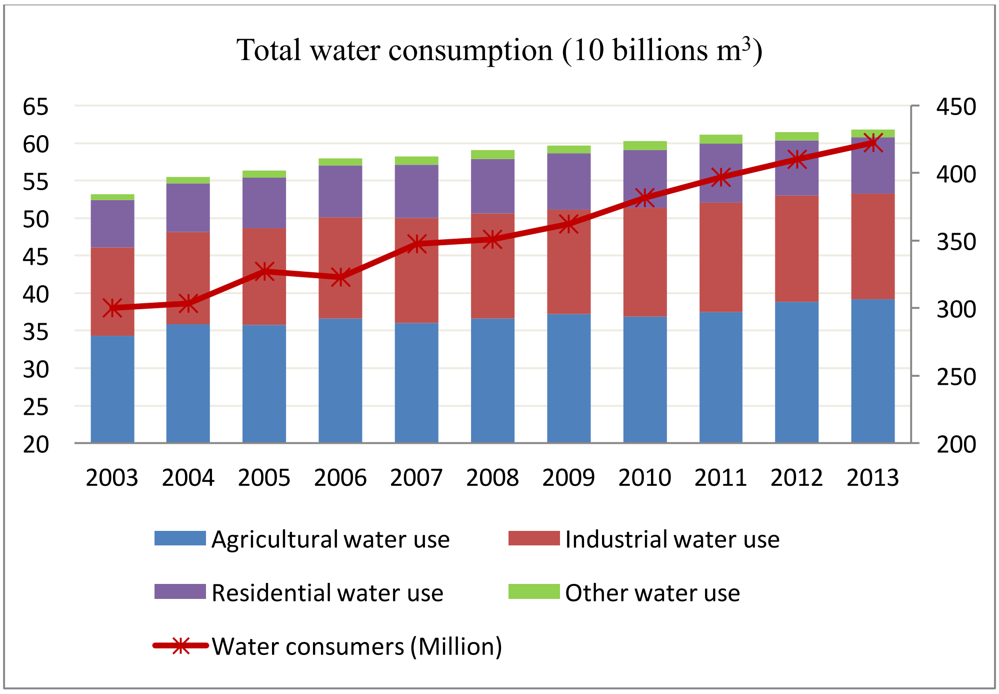

Figure 3. 1 Total Water Consumption of China

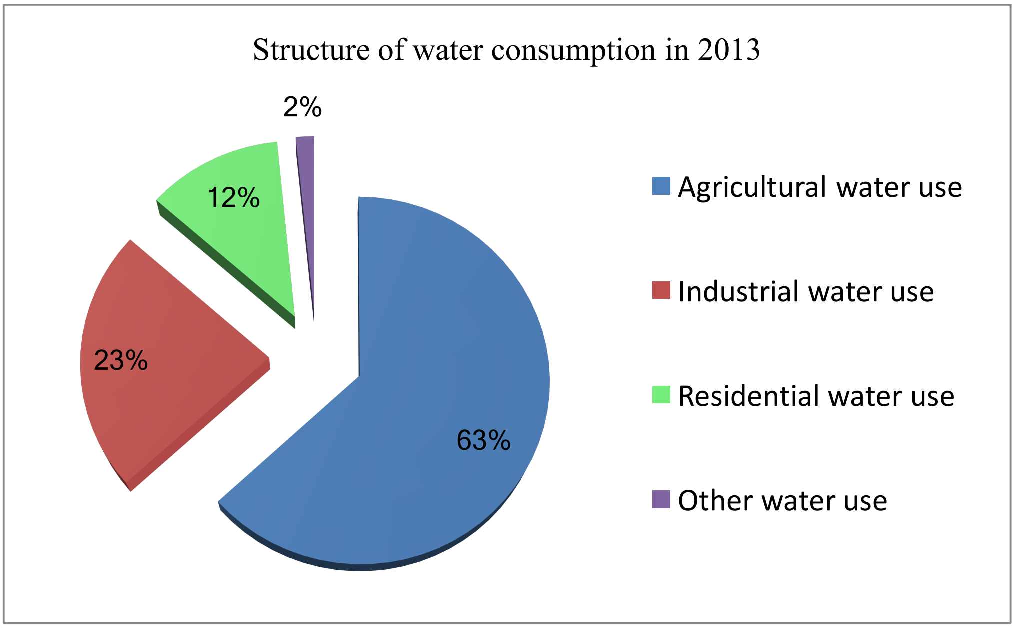

Figure 3. 2 Structure of Chinese Water Consumption in 2013

The main purpose of this research is to study the Chinese residential water demand system and analyze how the residential water market is affected by water price, income and other non-economic factors. The paper is organized as follows. Section two presents the literature review of world as well as Chinese residential water demand studies. Section three details the methodology of constructing the water demand system and model estimations. The data resources are discussed in section four. Both the log-linear model and reduced-form equations are estimated for Chinese residential water consumption. The empirical results are interpreted in section five, and section six concludes.

3.2. Literature Review

Since the 1960s, researchers paid more attention to water demand research because of its increasing importance to national development as well as living standards. Many studies concentrated on the analysis of residential water use and consumptions, including the impacts of price, income or some other environmental factors (Howe, 1967 & 1982; Nieswladomy, 1992; Dalhuisen at el, 2003; Gaudin, 2006; Ruijs at el, 2008). Some people considered residential water as a normal commodity, so water pricing is recommended to be a good market tool for controlling water consumption. But in other studies, water price was estimated to be inelastic (Howe, 1982; Ruijs at el, 2008). And there are also some studies that found the price elasticity was related to regional characteristics. They argued the price elasticity of water demand was higher in water shortage areas than the other regions of the country. Because people in these regions perhaps have a greater awareness of the scarcity of water and thus have higher price elasticities (Nieswiadomy, 1992). Some researchers also attributed the low price elasticity to the absence of price information on the water bills. The study indicated that the water price elasticity could increase 30% or more with taking the effect of price-related information, such as income, household size or climate change, into account (Gaudin, 2006). However, there should be another reason for the diversity of their researching results. That is the difference in the selection of models.

Some studies choose the linear logarithmic model to estimate water demand equations (Nieswiadomy, 1992; Gaudin, 2006; Olmstead at el, 2007), and some utilize semi-logarithmic form (Arbués and Barberán, 2004) or non-linear frame work (Dalhuisen at el, 2003) to deal with the corresponding problem. To estimate the water demand equation, the price variable is also seriously considered. Ruijs and Zimmermann (2008) selected marginal water price and average water price to estimate water demand models, and got similar results for these two sets of models. Each model has two equations: one is a linear equation and another one is a linear form with logarithmic income. All the results show that both price and income elasticities are inelastic. But there are also some studies indicate that consumers tend to respond to average prices rather than marginal prices (Foster and Beattie, 1981; Shin 1985). Gaudin (2006) only used the average water price in his model due to specificities of his dataset. In the study, a linear logarithmic model was built with average price, income, density, and some other climate factors. The results show that price-related information can raise the price elasticity of demand. Actually, this problem only exists with the block pricing policy. If no block pricing is implemented to the water market, the marginal water price equals average price.

Considering Chinese water demand, most of studies just focus on the industrial and agricultural water use, because water as an important production factor is a concern of many researchers (Wang and Lall, 2002; Yang, at el, 2003; Zhong and Mol, 2005). But for residential water consumption, very few studies can be found. A survey was designed to collect information on the residential water use from Beijing and Tianjin cities (Zhang and Brown, 2005). The empirical work shows that households in Beijing and Tianjin consumed much more water per capita than previously imagined and the water price and income do not have the expected impact on household water consumption. As no block pricing policy is applied to the consumers in the Chinese water market, some people believe block water price will be put into practice someday (Chen and Yang, 2009). They simulate the relationship between block water price and residential water demand of Beijing city by applying the extended linear expenditure system. In this research, we will concentrate on the analysis of the residential water demand system and study how Chinese residential water market is affected by water price, income, water resource and other related environmental factors.

3.3. Data Description

The data used in this study covered 31 provinces of China during the period between 2004 and 2013, and summary statistics are shown in Table 3.1. The data resources come from National Bureau of Statistics of China (NBSC) and contain annual information on per capita residential water consumption, residential water price, per capita income, per capita water resource, and average rainfall and temperature.

Table 3. 1 Data summary

Variable	Description	Number	Mean	Min	Max
id	Province ID	310	16	1	31
t	Time (year)	310	5.50	1.00	10.00
Q_d	Per capita RW consumption (m^3)	310	234.64	64.38	1550.00
$\ln Q_d$	Logarithm of Q_d	310	5.31	4.16	7.35
P	Real RW price (RMB per m^3)	310	1.69	0.80	3.93
lnP	Logarithm of P	310	0.46	-0.22	1.37
Y	Real per capita income (RMB)	310	25950.41	4317.00	88539.56
lnY	Logarithm of Y	310	9.97	8.37	11.39
RE	Per capita water resource (m^3)	310	6907.73	72.80	170261.31

lnRE	Logarithm of RE	310	7.18	4.29	12.05
RF	Annual rainfall (mm)	310	863.69	74.90	2628.20
lnRF	Logarithm of RF	310	6.59	4.32	7.87
TEMP	Average temperature (C^o)	310	14.32	4.30	25.40
lnTEMP	Logarithm of TEMP	310	2.59	1.46	3.23
D_1	D1=1 if 15000 < Y ≤ 30000	310	0.38	0	1
D_2	D2=1 if Y > 30000	310	0.30	0	1

Note: The data resources are published by National Bureau of Statistics of China.

Since 2003, the total water consumption of China increased 16.2% with residential water use increasing 18.9%. But the per capita residential water use declined in most of the regions during the sample period, as seen from Figure 3.4. The NBSC reports the annual number of residential water consumers from 2004 (303.4 millions), and the total number increased 39.3% up to the year of 2013 (422.6 millions), as shown in Figure 3.1. The NBSC does not report any changes of the statistical standard on population of water consumption. It seems that the decrease of per capita residential water use has a correlation with the shortage of water production. Meanwhile, regions including Beijing, Tianjin, Shanghai and Ningxia have to confront a serious water scarcity problem (Shown in Figure 3.3). The per capita water resource of Tianjin was only 72.8 cubic meters in 2010. To deal with the regional water shortage, Chinese government processes the transportation of water from the southern areas to the northern parts to relieve the press of water production (NBSC, 2014). The Xizang province has the largest per capita water resource, which is 142.5 thousand cubic meters and much higher than the average level of the whole country.

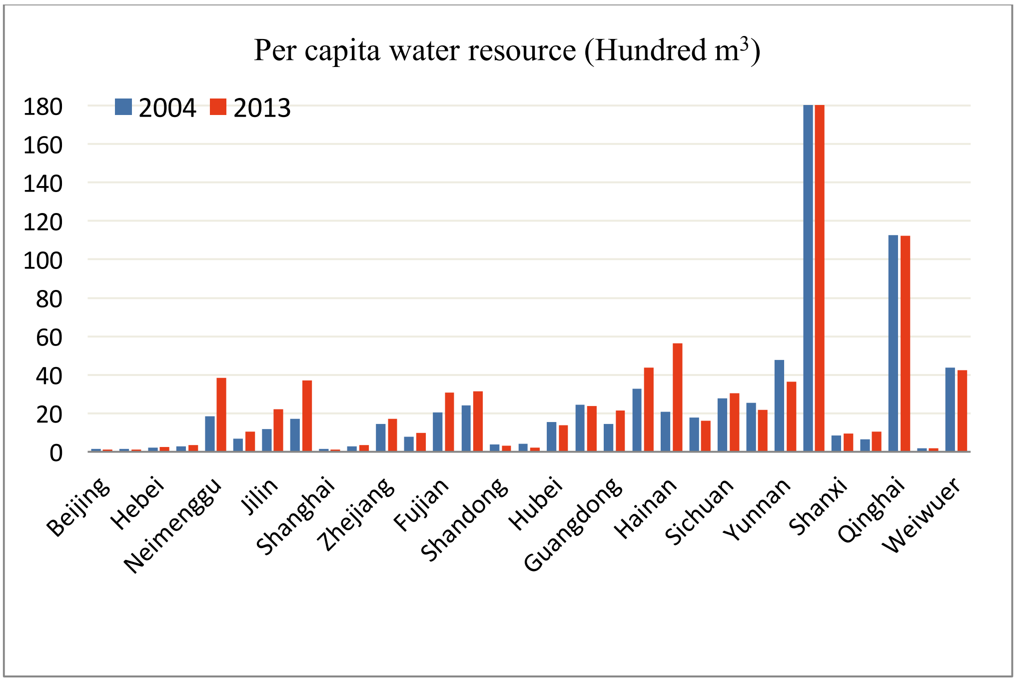

Figure 3. 3 Per Capita Water Resource of China

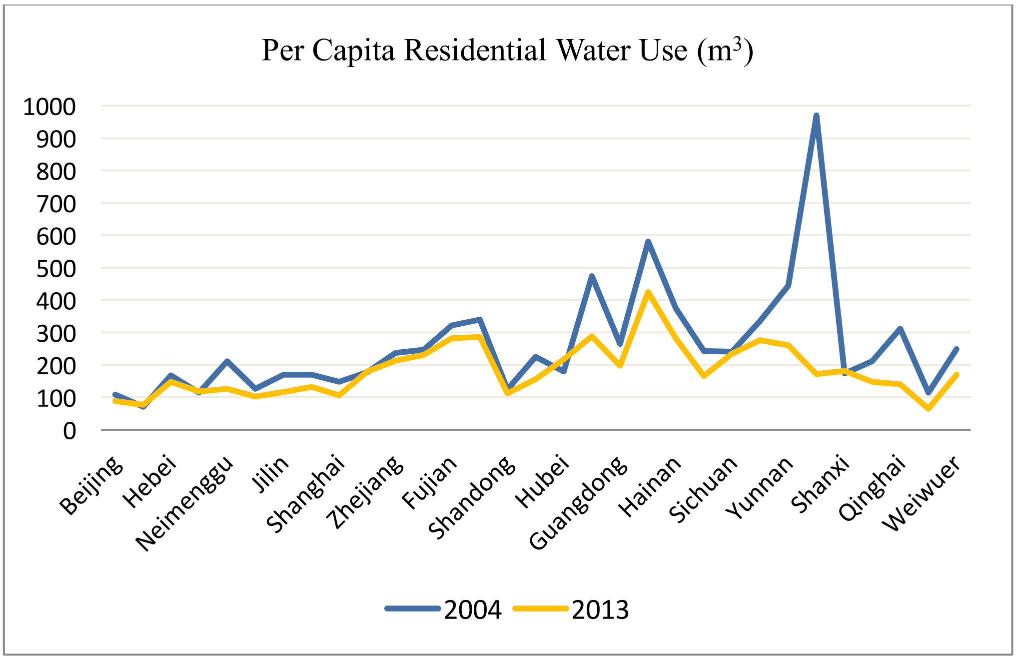

Figure 3. 4 Per Capita Residential Water Consumption of China

Furthermore, the residential water price is very low in many regions of China. The lowest nominal price is 1 RMB per m^3 in Xizang Province. And the region kept the same nominal water price between 2004 and 2013. As we cannot study the impacts of unchanged water price, we will employ the real price and income to estimate the residential water demand system. The Tianjin city has the highest real water price 3.93 RMB per m^3, and the price totally increased 15.7% during the sample period. In contrast, the Xizang province has the lowest real water price in 2013, and it experienced 2.4% decrease since the year of 2004 (Details are shown in Figure 3.5).

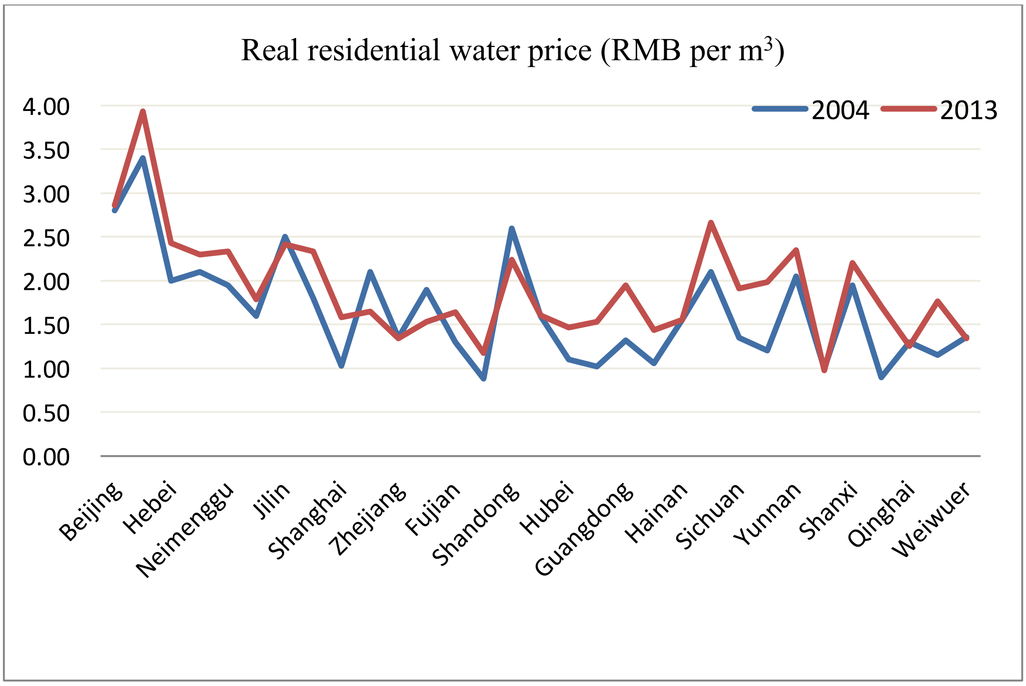

Figure 3. 5 Real Residential Water Price in China

During the sample period, real per capita income kept increasing for each province (Figure 3.6), but the income inequality is quite evident among the different provinces. Beijing, Tianjin and Shanghai provinces have the highest level of income, which is over 80000 RMB per capita during the year of 2013. However, for Guizhou, Gansu, Yunnan and Xizang provinces, the per capita income is less than 25000 RMB. In 2004, the per capita income of these four provinces is even less than 10000 RMB. In terms of the dummy variables, they are defined by the different levels of the real per capita income. As the mean value of real per capita income is 25950.41, we set the low level income with $Y \leq 15000$, the middle level income with $15000 < Y \leq 30000$ and the high level income with $Y > 30000$. Details are shown in Table 3.1.

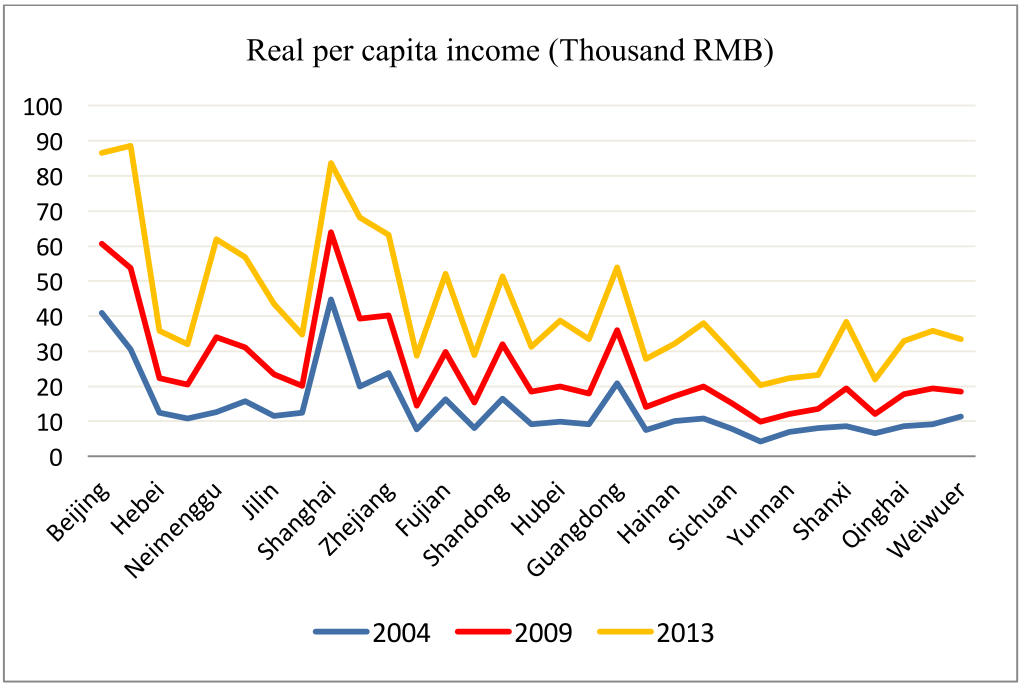

Figure 3. 6 Real per Capita Income in China

Temperature and rainfall are another two important factors considered in this study. Some people suggest that higher temperature and less rainfall make people consume more residential water (Gaudin, 2006; Ruijs at el, 2008). Because of the limitation of the data resource, we will use the information from the central city of each province to approximate the provincial temperature and rainfall.

3.4. Methodology

3.4.1. Log-linear Demand Model

In this study, two types of residential water demand models are considered. The first one is related to the log-linear demand functional form, which has been employed by many previous studies (Gaudin et al., 2001; Olmstead at el, 2007), because the log-linear demand functional form is easy to interpret. According to previous studies (Gaudin, 2006; Ruijs at el, 2008), the factors influencing residential water demand can be divided into two parts: the sociological section and the environmental section. The sociological part is mainly determined by water price and income, while the environmental part is concerned with water resource, regional temperature and rainfalls.

As water has no substitutes, all the cross-price elasticities are assumed to be negligible in this study. Meanwhile, we suppose price elasticities of residential water demand based on different levels of income are diverse, due to the income effect of the uncompensated price elasticity. The annual per capita income can be divided into three levels with setting two dummy variables. In the middle level of income, we have D_1 equals 1, else equals 0. For another dummy variable, D_2 equals 1 with the high level of income, else equals 0. Then we can establish the log-linear residential water demand function as follow:

$$lnQ_d = \alpha_0 + \alpha_2 lnP + \alpha_3 lnY + \alpha_4 lnRF + \alpha_5 lnTEMP + \alpha_6 lnRE + \alpha_7 D_1 * lnP + \alpha_8 D_2 * lnP \qquad (1)$$

where, Q_d is per capita residential water consumption, P is real residential water price, Y is per capita real income, RE is per capita water resource, RF is regional average rainfall, $TEMP$ is average temperature and D_is are dummy variables for each level of income. As a result, the price elasticity and the income elasticity can be calculated by the equations as follow:

$$\eta_p \approx \frac{dlnQ_d}{dlnP} = \alpha_2 \ and \ \varepsilon_Y \approx \frac{dlnQ_d}{dlnY} = \alpha_3$$

in which, η_p indicates the price elasticity and ε_Y reports the income elasticity. If $\alpha_2 < 0$ and $\alpha_3 > 0$ significantly, we can conclude that residential water is a normal good and water demand can be influenced by water price and regional income.

3.4.2. Equilibrium Displacement Model

Another common method used to analyze the demand system is establishing an equilibrium displacement model (EDM), but it has not yet been employed in the study of Chinese residential water demand. An important assumption for the EDM is that water price is not an exogenous variable as within the log-linear equation, and it allows the demand curve to shift due to the changes of income or some other factors. For example, if residential water is a normal good, the water demand curve will shift up with increased income (Figure 3.7). In other words, when income goes up, people will have additional money to consume more residential water at the same water price. Then a shortage will turn up between the water supply and water demand, which will prompt the equilibrium water price to increase. Thus, a new equilibrium point can be reached (Figure 3.7). In an equilibrium displacement model, the residential water price will adjust according to the changes of income or other exogenous variables.

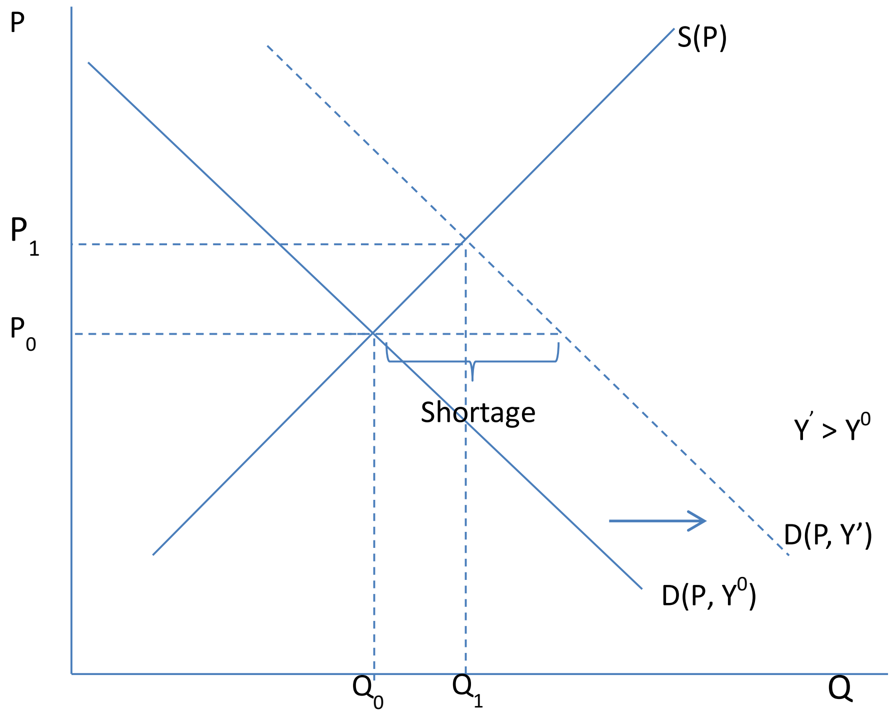

Figure 3. 7 Diagrams of Water Supply and Demand Equilibrium Assumption

To establish an equilibrium displacement model for the Chinese residential water market, we first assume that the water market is closed, and no real water trade happens in the residential water market. Generally, water trade is only occurred as an indirect form during the industrial or agricultural production process as “virtual water” (Hoekstra and Hung, 2002). Applying the factors analyzed in the log-linear demand function, we can define the Chinese residential demand system as

$Q_d = D(P, Y, TEMP, RF)$ (Residential water demand);

$Q_s = S(P, RE, TEMP, RF)$ (Residential water supply);

$\square_d = Q_s$ (Market equilibrium),

in which, Q_d is the quantity of residential water demanded, Q_s represents the quantity of residential water supplied, and RE indicates per capita water resource. Only Q_d, Q_s and P are endogenous variables, others are exogenous variables. Applying the first derivative, we can deduce the equilibrium displacement models as follows (Details see Appendix):

$$Q_d^* = \eta_p P^* + \eta_Y Y^* + \eta_T TEMP^* + \eta_{RF} RF^* \qquad (2)$$

$$Q_s^* = \varepsilon_p P^* + \varepsilon_R R^* + \varepsilon_T TEMP^* + \varepsilon_{RF} RF^* \qquad (3)$$

$$Q_d^* = Q_s^* = Q^* \qquad (4)$$

where, η_p implies the partial demand-price elasticity, ε_p is the partial supply-price elasticity, η_Y indicates the partial income elasticity and ε_R is the partial resource elasticity, etc. According to equation (4), we can get the reduced functional form for the residential water price as

$$P^* = \frac{\eta_Y}{\varepsilon_p - \eta_p} Y^* - \frac{\varepsilon_R}{\varepsilon_p - \eta_p} R^* + \frac{\eta_T - \varepsilon_T}{\varepsilon_p - \eta_p} TEMP^* + \frac{\eta_{RF} - \varepsilon_{RF}}{\varepsilon_p - \eta_p} RF^* \qquad (5)$$

Then put the equation (5) into the equation (2), and we can obtain the reduced functional form for the residential water consumption as

$$Q^* = \frac{\varepsilon_p \eta_Y}{\varepsilon_p - \eta_p} Y^* - \frac{\varepsilon_R \eta_p}{\varepsilon_p - \eta_p} R^* + \frac{\varepsilon_p \eta_T - \varepsilon_T \eta_p}{\varepsilon_p - \eta_p} TEMP^* + \frac{\varepsilon_p \eta_{RF} - \varepsilon_{RF} \eta_p}{\varepsilon_p - \eta_p} RF^* \qquad (6)$$

According to the equation (5) and the equation (6), the total elasticities are defined as

$$\eta_Y^p = \frac{P^*}{Y^*} = \frac{\eta_Y}{\varepsilon_p - \eta_p} \text{ and } \eta_Y^T = \frac{Q_d^*}{Y^*} = \frac{\varepsilon_p \eta_Y}{\varepsilon_p - \eta_p}$$

Similarly, if the residential water is a normal good, we can assume η_p is negative and ε_p and η_Y are positive, and then η_Y^p and η_Y^T should be also positive. But we cannot make sure whether the residential water is a normal good without empirical work. The empirical results are discussed in the section 5.

3.4.3. Pooled and Fixed Effects Models

In this study, the dataset is built on 31 provinces of China during the period between 2004 and 2013, with eight variables. To deal with the longitudinal data, we choose pooled and fixed effects models to estimate the demand equations. The basic model is expressed as

$$y_{it} = \alpha + x_{it}'\beta + \epsilon_{it} \qquad (7)$$

where, i indicates the ID of the province, and t means the time series. Both pooled and fixed effects models apply the assumptions that all the predictors are non-stochastic variables, and neither serial correlation nor contemporaneous correlation exists (Frees, 2004). The pooled model gives as the same estimation with OLS model and follows the homoscedastic assumption. But the fixed effects model allows α in the equation (7) to vary by different provinces. For our longitudinal data, the number of provinces is much larger than the number of time periods. Then the one-way fixed effects model $y_{it} = \alpha_i + x_{it}'\beta + \epsilon_{it}$ can be employed to explicit parameterization of the province-specific heterogeneity.

To test the province-specific heterogeneity, we can set the null hypothesis of homogeneity as $H_0: \alpha_1 = \alpha_2 = \cdots = \alpha_n = \alpha$, and utilize the partial F-(Chow) test to give the results (Frees, 2004). The process mainly contains three steps: Firstly, estimate the one-way fixed effects model with $y_{it} = \alpha_i + x_{it}'\beta + \epsilon_{it}$ to get SSE_F and MSE_F, where $SSE_F = \sum e^2$ and

$MSE_F = SSE_F/[N-(n+K)]$; Secondly, run the pooled model with $y_{it} = \alpha + x'_{it}\beta + \epsilon_{it}$ to get SSE_R; Thirdly, calculate the partial F-statistic, F-ratio = $(SSE_R - SSE_F)/(n-1)\ MSE_F$. The test will reject the null hypothesis H_0, if F-ratio exceeds a percentile from an F-distribution with numerator degrees of freedom $n-1$ and denominator degrees of freedom $N-(n+K)$. Note: N is the number of observations, n indicates the number of provinces and K equals the number of predictors.

3.4. Empirical Results and Discussion

Both the log-linear model and the reduced functional form are estimated in this section. The log-linear model gives the estimates of the partial elasticities, holding the water price constant, while the reduced-form estimation gives the total elasticities, allowing the water price to adjust. According to the data characteristics, pooled and fixed effect estimations are employed in the log-linear model, and an iterated seemingly unrelated estimation is applied to the reduced functional form equations.

3.4.1. Log-linear Demand Equation Estimations

Four models are estimated in this section, and the results are reported in Table 3.2. In the pooled estimations, the price elasticity of residential water demand from the non-dummy variable equation is -0.0937, and the coefficient is statistically significant. The value of the income elasticity equals -0.2337. The negative value implies the inferiority of residential water. Both the price and income are inelastic, as the absolute values of their elasticities are less than 1. The resource elasticity and the temperature elasticity are 0.2316 and

0.4299 respectively. They indicate the positive effects on the residential water consumption of China. The elasticity of average rainfall is also positive, but the estimated coefficient is not significant. Furthermore, we obtain consistent results from the income dummy variable model by using the same estimator, and no large differences happen to the impact of the same factors except the price. With the income dummy variables, we can see the changes on the price elasticity due to the different levels of income. The price elasticities with income dummy variables are estimated by $(\alpha_2 + \alpha_7 D_1) * \mathrm{lnP}$ and $(\alpha_2 + \alpha_8 D_2) * \mathrm{lnP}$ according to equation (1). The price elasticity for the low income level is -0.1238, and -0.1238 + 0.0472 = -0.0766 for the middle level of income. In terms of the high level of income, the estimate of price elasticity is -0.1238 + 0.0414 = -0.0824. Therefore, the water price becomes less elastic in the middle and high levels of income. But the coefficients of both two income dummy variables are not significant.

Table 3. 2 Estimated log-linear demand equations for residential water consumption

Variables	Pooled estimation (Standard Error)		Fix effect estimation (Standard Error)	
	Model without income dummy	Model with income dummy	Model without income dummy	Model with income dummy
Intercept	4.7977***	4.8891***	7.6100***	7.8559***
	(0.2722)	(0.3412)	(0.6592)	(0.6868)
lnP	-0.0937**	-0.1238*	-0.0664	-0.1104
	(0.0459)	(0.0684)	(0.0757)	(0.0831)
lnY	-0.2337***	-0.2435***	-0.1998***	-0.2253***
	(0.0239)	(0.0330)	(0.0259)	(0.0333)
lnRE	0.2316***	0.2312***	0.0234	0.0263
	(0.0113)	(0.0113)	(0.0510)	(0.0511)
lnTEMP	0.4299***	0.4304***	-0.0880	-0.0848
	(0.0471)	(0.0473)	(0.1705)	(0.1720)
lnRF	0.0172	0.0179	-0.0501	-0.0552
	(0.0316)	(0.0319)	(0.0490)	(0.0492)

D1*lnP		0.0472		0.0681
		(0.0721)		(0.0555)
D2*lnP		0.0414		0.0881
		(0.0851)		(0.0738)
CS1			-0.3773*	-0.3796*
CS2			-0.5784***	-0.5886***
CS3			-0.0626	-0.0573
CS4			-0.4707***	-0.4659***
CS5			0.0619	0.0630
CS6			-0.3839***	-0.3776***
CS7			-0.2968**	-0.2916**
CS8			-0.2342*	-0.2312*
CS9			-0.1766	-0.1365
CS10			0.2484	0.2652
CS11			0.3439*	0.3619**
CS12			0.2684	0.2814*
CS13			0.4853**	0.4938**
CS14			0.5133***	0.5114***
CS15			-0.2378	-0.2422
CS16			0.0717	0.0813
CS17			0.0474	0.0562
CS18			0.7478***	0.7497***
CS19			0.3718*	0.3860*
CS20			1.0780***	1.0750***
CS21			0.6557***	0.6616***
CS22			0.1794	0.1847
CS23			0.2795*	0.2795*
CS24			0.4115***	0.4072***
CS25			0.5584***	0.5699***
CS26			0.8153***	0.7985***
CS27			0.0182	0.0222
CS28			-0.1270	-0.1324
CS29			0.1775*	0.1771*
CS30			-0.8227***	-0.8209***
R-square	0.8131	0.8134	0.9195	0.9200
F-statistic	264.57***	188.06***	12.07***	12.08***
F-chow test [a]	0.19		0.84	
F-chow test [b]	12.05***			

Note: *, ** and *** indicate the rejection of null hypothesis at the level 0.1, 0.05 and 0.01; a: F-chow test for dummy or non-dummy model; b: F-chow test for pooled or fixed effects model. CS1-CS30 indicate the province dummy variables.

In the fixed effects estimations, the results are somewhat different from those in the pooled estimations. First, most of coefficients become less significant, and only income elasticities are statistically significant. Secondly, the impacts of average temperature and rainfall are negative, which means that people tend to consume less residential water with the higher temperature and more rainfall. The price elasticities given by the fixed effects estimations are -0.0664 and -0.1104 for the no income dummy variable model and full model respectively. Compared with the results in the pooled model estimations, all the price elasticities become less elastic. For the middle level of income, the price elasticity is -0.1104 + 0.0681 = -0.0423, while for the high level of income, the estimated price elasticity is -0.1104 + 0.0881 = -0.0223. Therefore, water price becomes less elastic in the higher level of income. The income elasticity from the no income dummy variable model is -0.1998, which also implies that the residential water is an inferior good.

The partial F-(Chow) test is applied to determine the selection between the income dummy variable and non-dummy variable models, and also the choice between pooled and fixed effects estimators. Firstly, we found the income dummy variables cannot have significant effects on the residential water demand system. Specifically, the F-(Chow) test of pooled estimations reveals that the F-value of 0.19 cannot reject the null hypothesis of no income dummy variable model. When it comes to the fixed effects estimation, the null hypothesis cannot be rejected by the F-value of 0.84, either. In addition, the coefficients of two interaction terms with the income dummy variable are insignificant in both pooled and fixed effects models. And the residential water is proved to be inferior good by the empirical results. All the evidence implies that the impacts of different levels of income are irrelevant or not important.

Secondly, comparing the pooled model and the fixed effects model, we find that the pooled model as the null hypothesis is rejected by the fixed effects model due to the F-(Chow) test value of 12.05. Meanwhile, the coefficients of most province dummy variables are significant in the fixed effects model, which indicates a heteroscedasticity problem exists among the different provinces. As a result, the no income dummy variable model gives the most appropriate results by applying the fixed effects estimation.

3.4.2. EDM Reduced-Form Equation Estimation

Two reduced-form equations are derived from the equilibrium displacement model-- the price equation and the quantity equation. Each equation has four same exogenous variables, and can be just-identified at the same time. We apply the iterated seemingly unrelated estimator (SURE) to get the empirical results. The iterated SURE is popular for estimating the system equations that the equation errors are correlated across equations for a given individual but uncorrelated across individuals. The estimated results are reported in Table 3.3 (Function details see Appendix).

Table 3. 3 Estimated reduced-form equations for water price and consumption

Equation	lnY	lnRE	lnTEMP	lnRF	intercept	R-square
lnP	0.128***	-0.091***	-0.187***	0.010	0.259	0.314
	(0.030)	(0.011)	(0.050)	(0.040)	(0.378)	
lnQ_d	-0.246***	0.240***	0.447***	0.016***	4.773***	0.811
	(0.026)	(0.019)	(0.045)	(0.039)	(0.280)	
Elasticity	Estimate		Elasticity		Estimate	
η_p	-2.647		η_T		-0.047	
ε_p	-1.926		ε_T		0.088	

η_Y	0.092	η_{RF}	0.044
ε_R	0.066	ε_{RF}	0.036

Note: *, ** and *** indicate the rejection of null hypothesis at the level 0.1, 0.05 and 0.01.

According to equation (5) and (6), we can get the total elasticities as follows:

$$\eta_Y^p = \frac{P^*}{Y^*} = \frac{\eta_Y}{\varepsilon_p - \eta_p} = 0.1276 \text{ and } \eta_Y^T = \frac{Q_d^*}{Y^*} = \frac{\varepsilon_p \eta_Y}{\varepsilon_p - \eta_p} = -0.2457$$

And

$$\varepsilon_R^p = \frac{P^*}{R^*} = -\frac{\varepsilon_R}{\varepsilon_p - \eta_p} = -0.0907 \text{ and } \varepsilon_R^T = \frac{Q_s^*}{R^*} = -\frac{\varepsilon_R \eta_p}{\varepsilon_p - \eta_p} = 0.2401$$

where, η_Y^p, η_Y^T, ε_R^p and ε_R^T are total elasticities, and η_Y, η_p, ε_p and ε_R are partial elasticities. Solving these equations, then we can obtain the results as η_p= -2.6472, ε_p= -1.9255, η_Y= 0.0920 and ε_R= 0.0655. As we have discussed in the log-linear model, empirical results show that residential water is an inferior good and the income elasticity is significantly negative. We also get a negative value for the total income elasticity from the reduced functional form. However, with positive total income-price elasticity η_Y^p and negative total income-demand elasticity η_Y^T, we can only solve the negative partial supply elasticity ε_p. According to the estimated reduced-form results, we can draw the diagram for the water market equilibrium as Figure 3.8.

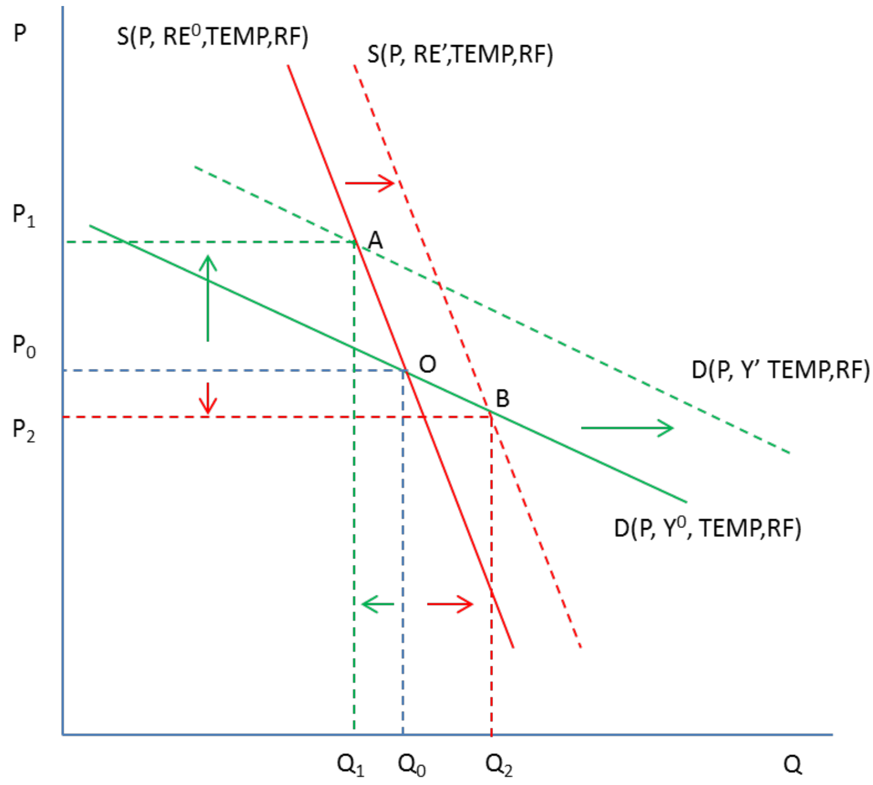

Figure 3. 8 Estimated Water Supply and Demand Equilibrium

Because of the inequality $|\eta_p| > |\varepsilon_p|$, we can know that the water demand curve is more elastic than the supply curve, and then the supply curve will be steeper than the demand curve. The equation $\eta_Y^p = \frac{P^*}{Y^*} = 0.1276$ indicates that 1% increase in the income will take 0.128% increase in the residential water price. In the other words, the income growth will shift the demand curve up. At the new equilibrium point A, the water price increase to P_1, but the consumption decrease to Q_1. This situation is consistent with the result $\eta_Y^T = \frac{Q_d^*}{Y^*} = -0.2457$. When income increases 1 percent, the water consumption will decrease 0.246 percent. In contrast with the total income elasticity, the value of the partial income elasticity η_Y is positive. This situation implies the income growth will take a temporary increase in water consumption. But after a period of time, water demand will go down with the increase of income.

For the water supply, an increase of water resource will shift the supply curve to the right as shown in Figure 3.8. Due to the equations $\varepsilon_R^p = \frac{P^*}{R^*} = -0.0907$ and $\varepsilon_R^T = \frac{Q_S^*}{R^*} = 0.2401$, one percentage increase in water resource will cause 0.09 percent decrease in water price and 0.24 percent increase in water consumption. After the shifting, the new equilibrium is reached at the point B. It is clear to see that the new equilibrium water price decrease to P_2 but the equilibrium water consumption arise to Q_2. The partial resource elasticity is ε_R= 0.0655, which is smaller than the total resource elasticity ε_R^T. It implies the water consumption will grow faster, if people see the water resource increasing during the long run.

3.5. Conclusion

This paper undertook the residential water demand analysis based on the panel data, covering 31 provinces during the sample period from 2004 to 2013 in China. Two models are employed in this study. For the log-linear demand model, we found the different income levels do not influence the water price elasticity significantly and the fixed effects estimator gives more appropriate estimates for the water demand system. The results show that both the water price elasticity and the income elasticity are negative. Although water consumption would decline with an increase of water price, income growth cannot prompt the growth in residential water demand. As a consequence, residential water is proved to be an inferior good. In addition, both water price and income are inelastic for the residential water demand.

Furthermore, two reduced-form equations (price equation and quantity equation) are derived from the equilibrium displacement model to analyze the impacts of water price, per capita income, water resources and some other factors. The reduced-form equations give the total elasticities, allowing the water price to adjust. The partial elasticities can be solved according to the estimates of those total elasticities, as both the reduced-form equations are just-identified. The results reveal that income growth can raise the water price, and more water resource will prompt the price to go down. Both the partial price elasticities of water demand and water supply are negative and elastic in the short run. The negative estimate of the total income elasticity is consistent with the results of the log-linear model estimation. But the partial income elasticity is positive. In the other words, income growth will prompt a temporary increase in residential water demand, but for the long run the residential water consumption will decline with continuous increasing in income. This may be caused by the inferiority of residential water. People with higher income are more likely to consume water with higher quality, such as the bottled water. That is true, because the pipe water needs to be boiled before drinking in China, while the bottled water can be drunk without any treatment healthily.

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Appendix A: Tables

Table A. 1 Probit estimates for likelihood of female participation in employment, by country

Variable[a]	CH	AM	BO	CO	GE	GH	KE[b]	LA	MKD	LK	UA	VN
Intercept	-3.253***	-1.623***	-2.122***	-1.839***	-1.918***	-1.628***	-1.173***	-2.073***	-3.347***	-1.211***	-2.764***	-2.119***
	(0.367)	(0.184)	(0.331)	(0.278)	(0.229)	(0.317)	(0.317)	(0.385)	(0.205)	(0.200)	(0.279)	(0.249)
Age 15-19	0.058	-1.177***	0.718**	0.417	-1.087***	-0.396	-0.291	-0.383	-0.496	-0.913***	-0.705**	-0.024
	(0.423)	(0.258)	(0.321)	(0.290)	(0.324)	(0.346)	(0.337)	(0.408)	(0.332)	(0.229)	(0.356)	(0.265)
Age 20-24	0.921***	-0.236	1.115***	1.181***	-0.094	0.531*	0.266	0.677*	0.169	-0.172	0.309*	1.336***
	(0.345)	(0.151)	(0.319)	(0.288)	(0.162)	(0.316)	(0.319)	(0.393)	(0.189)	(0.210)	(0.179)	(0.238)
Age 25-29	1.893***	0.042	1.491***	1.419***	0.081	0.887***	0.650**	1.188***	0.797***	0.228	0.906***	2.187***
	(0.340)	(0.148)	(0.322)	(0.285)	(0.158)	(0.313)	(0.322)	(0.401)	(0.168)	(0.195)	(0.162)	(0.243)
Age 30-34	1.676***	0.064	1.624***	1.594***	0.234	0.987***	0.933***	1.395***	1.169***	0.189	1.225***	2.299***
	(0.320)	(0.142)	(0.326)	(0.282)	(0.151)	(0.326)	(0.328)	(0.400)	(0.159)	(0.187)	(0.166)	(0.238)
Age 35-39	1.669***	0.329**	1.844***	1.641***	0.382***	1.124***	0.974***	1.682***	1.232***	0.640***	1.282***	2.088***
	(0.301)	(0.143)	(0.327)	(0.283)	(0.148)	(0.339)	(0.338)	(0.397)	(0.154)	(0.184)	(0.167)	(0.231)
Age 40-44	1.795***	0.328**	1.701***	1.502***	0.465***	1.135***	1.063***	1.478***	1.292***	0.438**	1.427***	1.808***
	(0.303)	(0.146)	(0.343)	(0.295)	(0.148)	(0.378)	(0.350)	(0.401)	(0.159)	(0.183)	(0.168)	(0.238)
Age 45-49	1.592***	0.367**	1.442***	1.369***	0.265*	1.124***	1.067***	1.204***	1.168***	0.670***	1.443***	1.835***

	(0.300)	(0.143)	(0.339)	(0.281)	(0.148)	(0.401)	(0.360)	(0.417)	(0.160)	(0.188)	(0.157)	(0.238)
Age 50-54	1.272***	0.454***	1.601***	1.275***	0.096	0.503	0.828**	1.032**	1.444***	0.415**	1.134***	1.360***
	(0.311)	(0.134)	(0.354)	(0.283)	(0.147)	(0.402)	(0.421)	(0.421)	(0.157)	(0.192)	(0.142)	(0.231)
Age 55-59	0.467	0.357***	1.482***	0.704**	0.209	0.870**	--	0.716*	0.980***	0.460**	0.336**	0.778***
	(0.340)	(0.138)	(0.411)	(0.291)	(0.145)	(0.400)	--	(0.422)	(0.155)	(0.197)	(0.135)	(0.235)
Years of education	0.163***	0.093	0.069***	0.045***	0.089***	0.056***	0.034***	0.103***	0.162***	0.067***	0.159***	0.067***
	(0.015)	(0.010)	(0.011)	(0.012)	(0.012)	(0.010)	(0.008)	(0.011)	(0.010)	(0.011)	(0.019)	(0.009)
Married	-0.014	-0.435***	-0.426***	-0.347***	-0.195**	0.017	-0.430***	0.081	0.214**	-0.408***	-0.036	-0.117
	(0.146)	(0.077)	(0.117)	(0.121)	(0.080)	(0.129)	(0.088)	(0.134)	(0.095)	(0.108)	(0.087)	(0.093)
Number of children	-0.380**	-0.114**	0.031	-0.115*	-0.187***	-0.189***	-0.059	-0.206**	-0.237***	-0.225***	-0.483***	-0.174***
	(0.152)	(0.056)	(0.060)	(0.068)	(0.057)	(0.068)	(0.050)	(0.081)	(0.064)	(0.073)	(0.086)	(0.061)
Has a chronic illness	-0.288**	-0.037	0.204*	-0.017	-0.264***	-0.164	0.022	-0.036	-0.232**	-0.280**	-0.200**	-0.293***
	(0.142)	(0.084)	(0.115)	(0.104)	(0.085)	(0.201)	(0.145)	(0.162)	(0.107)	(0.113)	(0.084)	(0.094)
Head of family	0.062	-0.184**	0.464***	0.260**	0.092	0.432***	0.410***	0.123	0.187	-0.093	-0.082	0.234***
	(0.099)	(0.083)	(0.134)	(0.102)	(0.091)	(0.118)	(0.088)	(0.185)	(0.121)	(0.112)	(0.115)	(0.091)
Likelihood Ratio	359.50	219.51	169.61	187.12	193.72	191.27	233.65	309.52	657.63	145.08	405.92	509.42
Estrella	0.340	0.105	0.175	0.167	0.100	0.225	0.152	0.356	0.319	0.095	0.283	0.323

[a] The dependent variable is a binary variable that equals 1 if individual is a wage employee; else equals 0.
[b] The reference category of age groups is age 55-64 in Kenya wage equation, since the sample size of age group 60-64 is too small.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Table A. 2 Probit estimates for likelihood of male participation in employment, by country

Variable[a]	CH	AM	BO	CO	GE	GH	KE[b]	LA	MKD	LK	UA	VN
Intercept	-1.894***	-1.864***	-1.451***	-0.936***	-2.557***	-0.943***	-0.691***	-1.461***	-2.126***	-0.819***	-2.685***	-1.649***
	(0.300)	(0.292)	(0.410)	(0.304)	(0.349)	(0.322)	(0.215)	(0.404)	(0.216)	(0.312)	(0.420)	(0.270)
Age 15-19	-0.138	-0.778**	0.679**	-0.362	-0.549	-0.592*	-0.504**	0.166	-0.376	0.018	0.199	-0.023
	(0.345)	(0.322)	(0.337)	(0.311)	(0.371)	(0.324)	(0.240)	(0.394)	(0.239)	(0.294)	(0.343)	(0.254)
Age 20-24	0.714**	0.345	1.118***	1.011***	0.538**	0.298	0.198	0.622	0.227	1.222***	1.363***	0.856***
	(0.311)	(0.240)	(0.330)	(0.295)	(0.240)	(0.292)	(0.211)	(0.396)	(0.188)	(0.289)	(0.272)	(0.229)
Age 25-29	1.706***	0.507**	1.826***	1.556***	0.667***	0.989***	0.789***	1.280***	0.948***	1.949***	2.103***	1.959***
	(0.321)	(0.236)	(0.351)	(0.301)	(0.229)	(0.287)	(0.213)	(0.389)	(0.173)	(0.299)	(0.270)	(0.245)
Age 30-34	1.758***	0.519**	1.679***	1.628***	0.717***	1.062***	0.818***	1.599***	1.243***	1.881***	2.126***	1.971***
	(0.268)	(0.228)	(0.359)	(0.318)	(0.223)	(0.298)	(0.221)	(0.396)	(0.173)	(0.285)	(0.315)	(0.239)
Age 35-39	1.375***	0.094	1.918***	1.636***	0.296	0.969***	0.561**	1.807***	1.198***	1.609***	1.487***	2.232***
	(0.234)	(0.234)	(0.413)	(0.330)	(0.224)	(0.332)	(0.226)	(0.422)	(0.165)	(0.267)	(0.263)	(0.249)
Age 40-44	1.505***	0.221	2.253***	1.241***	0.462**	1.298***	0.451*	1.586***	1.088***	1.604***	1.381***	1.560***
	(0.229)	(0.235)	(0.552)	(0.317)	(0.228)	(0.371)	(0.250)	(0.414)	(0.156)	(0.258)	(0.260)	(0.231)
Age 45-49	1.630***	0.212	2.021***	1.231***	0.377*	1.309***	0.679**	1.855***	1.036***	1.333***	1.244***	1.665***
	(0.229)	(0.221)	(0.482)	(0.306)	(0.225)	(0.392)	(0.274)	(0.420)	(0.157)	(0.259)	(0.256)	(0.225)
Age 50-54	1.126***	0.592***	0.959**	0.638**	0.369*	0.827**	0.356	1.414***	0.987***	1.278***	1.354***	1.107***

	(0.238)	(0.219)	(0.415)	(0.309)	(0.208)	(0.385)	(0.299)	(0.449)	(0.161)	(0.270)	(0.247)	(0.221)
Age 55-59	0.860***	0.344	1.480***	0.451	0.309	0.667*	--	1.218***	0.823***	0.639**	1.058***	0.738***
	(0.234)	(0.216)	(0.473)	(0.317)	(0.225)	(0.360)	--	(0.429)	(0.149)	(0.263)	(0.240)	(0.217)
Years of education	0.102***	0.095***	0.023	0.018	0.101***	0.015	0.001	0.037***	0.088***	-0.011	0.110***	0.047***
	(0.016)	(0.015)	(0.019)	(0.016)	(0.017)	(0.012)	(0.009)	(0.014)	(0.011)	(0.017)	(0.027)	(0.012)
Married	-0.150	0.299**	0.653***	0.329**	0.324**	0.512***	0.385***	0.391**	0.245**	0.358*	0.204	0.393***
	(0.162)	(0.147)	(0.224)	(0.166)	(0.126)	(0.162)	(0.115)	(0.187)	(0.099)	(0.205)	(0.154)	(0.141)
Number of children	0.200	0.011	0.205**	0.363***	0.182*	0.044	0.087	0.052	-0.011	0.047	-0.229*	-0.134*
	(0.167)	(0.093)	(0.094)	(0.112)	(0.089)	(0.091)	(0.076)	(0.088)	(0.067)	(0.108)	(0.138)	(0.081)
Has a chronic illness	0.030	-0.512***	0.178	-0.292*	-0.504***	0.109	-0.281	-0.594**	-0.312**	-0.622***	-0.365***	-0.140
	(0.148)	(0.150)	(0.181)	(0.173)	(0.145)	(0.225)	(0.231)	(0.254)	(0.125)	(0.154)	(0.127)	(0.127)
Head of family	0.006	0.152	0.687***	0.293**	0.090	0.484***	0.649***	0.553***	0.128	0.385**	0.605***	0.156
	(0.104)	(0.127)	(0.166)	(0.145)	(0.114)	(0.134)	(0.102)	(0.204)	(0.097)	(0.191)	(0.146)	(0.111)
Likelihood Ratio	211.05	156.12	250.18	249.21	157.70	348.97	411.46	315.82	378.17	289.63	205.81	412.08
Estrella	0.250	0.199	0.350	0.335	0.174	0.396	0.290	0.469	0.234	0.345	0.314	0.380

Table A. 3 Wage equation estimates with OLS and Heckman, by gender and country (China, Armenia and Bolivia)

Variable	Panel A: OLS						Panel B: Heckman[a]					
	Female			Male			Female			Male		
	CH	AM	BO	CH	AM	BO	CH	AM	BO	CH	AM	BO
Intercept	-1.072***	-0.203	0.755**	-1.238***	0.258	0.351	-1.909***	-2.413***	0.200	-2.237***	0.810**	0.544*
	(0.302)	(0.195)	(0.379)	(0.235)	(0.216)	(0.280)	(0.371)	(0.240)	(0.634)	(0.255)	(0.361)	(0.312)
Age 15-19	0.525	0.052	-0.302	0.199	0.010	0.049	0.599*	-0.782**	-0.200	0.188	0.209	0.062
	(0.378)	(0.397)	(0.387)	(0.304)	(0.326)	(0.257)	(0.361)	(0.360)	(0.390)	(0.288)	(0.332)	(0.252)
Age 20-24	0.438	0.044	-0.324	0.330	0.489***	-0.035	0.705**	-0.049	-0.133	0.632***	0.438**	-0.089
	(0.301)	(0.175)	(0.385)	(0.235)	(0.172)	(0.253)	(0.296)	(0.185)	(0.416)	(0.232)	(0.173)	(0.252)
Age 25-29	0.658**	-0.015	-0.129	0.438**	0.388**	0.018	1.045***	0.130	0.134	0.977***	0.295*	-0.103
	(0.294)	(0.169)	(0.383)	(0.214)	(0.157)	(0.250)	(0.299)	(0.179)	(0.447)	(0.217)	(0.164)	(0.262)
Age 30-34	0.476	0.115	-0.254	0.355*	0.490***	0.087	0.844***	0.185	0.037	0.906***	0.393**	-0.028
	(0.291)	(0.163)	(0.385)	(0.201)	(0.147)	(0.250)	(0.294)	(0.175)	(0.462)	(0.202)	(0.156)	(0.261)
Age 35-39	0.526*	-0.006	-0.267	0.341*	0.386**	0.461*	0.912***	0.363**	0.061	0.799***	0.362**	0.336
	(0.287)	(0.155)	(0.382)	(0.197)	(0.168)	(0.251)	(0.292)	(0.173)	(0.481)	(0.194)	(0.167)	(0.265)
Age 40-44	0.403	0.084	-0.441	0.454**	0.430**	0.374	0.804***	0.409**	-0.126	0.950***	0.382**	0.243
	(0.287)	(0.158)	(0.388)	(0.195)	(0.166)	(0.249)	(0.294)	(0.178)	(0.480)	(0.194)	(0.167)	(0.264)
Age 45-49	0.433	0.168	-0.055	0.291	0.208	0.202	0.807***	0.520***	0.227	0.816***	0.154	0.071

	(0.288)	(0.151)	(0.392)	(0.195)	(0.152)	(0.256)	(0.292)	(0.172)	(0.465)	(0.194)	(0.154)	(0.271)
Age 50-54	0.332	0.168	-0.168	0.304	0.277*	0.265	0.626**	0.531***	0.129	0.710***	0.174	0.177
	(0.294)	(0.143)	(0.396)	(0.203)	(0.146)	(0.289)	(0.290)	(0.164)	(0.474)	(0.200)	(0.155)	(0.292)
Age 55-59	0.310	0.091	-0.064	0.178	0.130	0.216	0.466	0.373**	0.249	0.493**	0.069	0.112
	(0.323)	(0.147)	(0.428)	(0.207)	(0.152)	(0.274)	(0.310)	(0.168)	(0.511)	(0.201)	(0.155)	(0.281)
Months in current job	0.001***	-0.0003	0.001*	0.001***	0.0002	0.001	0.001***	0.0001	0.001*	0.001***	0.0003	0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Years of education	0.063***	0.056***	0.023*	0.067***	0.023**	0.025**	0.087***	0.126***	0.033**	0.094***	0.005	0.024**
	(0.008)	(0.010)	(0.012)	(0.010)	(0.011)	(0.012)	(0.011)	(0.013)	(0.015)	(0.011)	(0.015)	(0.012)
Has an industry or govt certificate	0.050	0.016	0.114	-0.063	0.179	-0.026	0.057	0.032	0.117	-0.051	0.201	-0.027
	(0.049)	(0.102)	(0.084)	(0.061)	(0.147)	(0.092)	(0.049)	(0.083)	(0.083)	(0.060)	(0.144)	(0.090)
Participate in a training	0.128**	0.071	0.109	0.071	0.106	0.016	0.120**	0.096	0.111	0.077	0.105	0.010
	(0.056)	(0.084)	(0.084)	(0.077)	(0.115)	(0.094)	(0.055)	(0.072)	(0.082)	(0.076)	(0.112)	(0.092)
Married	-0.086	-0.038	0.106	0.178**	0.170*	0.102	-0.094	-0.370***	0.020	0.151*	0.117	0.057
	(0.064)	(0.067)	(0.086)	(0.083)	(0.098)	(0.096)	(0.066)	(0.081)	(0.116)	(0.089)	(0.101)	(0.100)
High skilled white collar	0.124	0.245**	0.249*	0.447***	0.202*	0.677***	0.116	0.188**	0.246**	0.404***	0.223**	0.669***
	(0.086)	(0.116)	(0.127)	(0.102)	(0.112)	(0.141)	(0.083)	(0.092)	(0.124)	(0.097)	(0.109)	(0.138)
Low skilled white collar	0.001	0.202*	-0.104	0.059	-0.276**	0.068	-0.001	0.075	-0.108	0.036	-0.243**	0.062
	(0.075)	(0.117)	(0.103)	(0.090)	(0.121)	(0.137)	(0.073)	(0.092)	(0.100)	(0.084)	(0.120)	(0.134)

Machine operator	0.040	0.335	-0.018	0.286***	0.102	0.307**	0.045	0.280	-0.018	0.272***	0.111	0.300**
	(0.107)	(0.225)	(0.142)	(0.099)	(0.117)	(0.128)	(0.104)	(0.172)	(0.139)	(0.093)	(0.114)	(0.125)
Asset wealth index	0.059***	0.022	0.216***	0.004	0.086**	0.170***	0.059***	0.065**	0.214***	0.005	0.085**	0.178***
	(0.022)	(0.035)	(0.042)	(0.032)	(0.035)	(0.047)	(0.022)	(0.028)	(0.041)	(0.032)	(0.034)	(0.046)
Sigma							0.508***	1.149***	0.742***	0.687***	0.603***	0.780***
							(0.027)	(0.051)	(0.064)	(0.031)	(0.050)	(0.028)
Rho							0.549***	0.953***	0.382	0.765***	-0.468**	-0.233
							(0.127)	(0.010)	(0.326)	(0.058)	(0.212)	(0.171)
R-square	0.333	0.092	0.316	0.309	0.214	0.317	--	--	--	--	--	--

[a] Describes the estimates for the second stage of Heckman selection model, while the estimates of first stage are reported in Table A.1 and Table A.2.
[b] The reference category of age groups is age 55-64 in Kenya wage equation, since the sample size of age group 60-64 is too small.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued 1 (Colombia, Georgia and Ghana)

Variable	Panel A: OLS						Panel B: Heckman[a]					
	Female			Male			Female			Male		
	CO	GE	GH	CO	GE	GH	CO	GE	GH	CO	GE	GH
Intercept	0.365	-0.436*	0.193	0.309	0.606	-0.241	-1.207***	-1.492**	1.358**	0.507*	0.890	-0.019
	(0.386)	(0.235)	(0.501)	(0.244)	(0.368)	(0.326)	(0.395)	(0.683)	(0.561)	(0.266)	(0.695)	(0.476)
Age 15-19	-0.341	0.329	-0.854	-0.006	-0.624	0.331	-0.143	-0.042	-0.537	0.071	-0.576	0.522
	(0.386)	(0.505)	(0.564)	(0.264)	(0.549)	(0.376)	(0.363)	(0.536)	(0.550)	(0.262)	(0.538)	(0.479)
Age 20-24	-0.369	0.489**	-0.929*	-0.006	-0.019	0.108	0.265	0.480**	-1.038**	-0.101	-0.072	0.114
	(0.374)	(0.193)	(0.495)	(0.219)	(0.238)	(0.295)	(0.359)	(0.195)	(0.481)	(0.222)	(0.256)	(0.290)
Age 25-29	-0.030	0.205	-0.657	0.075	-0.275	0.153	0.726**	0.251	-1.021**	-0.065	-0.335	0.054
	(0.369)	(0.178)	(0.487)	(0.218)	(0.216)	(0.281)	(0.357)	(0.183)	(0.479)	(0.228)	(0.245)	(0.318)
Age 30-34	-0.216	0.193	-0.582	0.094	-0.133	0.364	0.660*	0.293	-0.990**	-0.051	-0.201	0.253
	(0.368)	(0.167)	(0.499)	(0.219)	(0.206)	(0.280)	(0.359)	(0.180)	(0.495)	(0.230)	(0.246)	(0.328)
Age 35-39	-0.055	0.195	-0.594	0.180	0.043	0.128	0.838**	0.345*	-1.068**	0.039	0.006	0.024
	(0.368)	(0.155)	(0.509)	(0.222)	(0.212)	(0.290)	(0.359)	(0.182)	(0.508)	(0.232)	(0.219)	(0.330)
Age 40-44	-0.142	0.267*	-0.636	0.233	-0.191	0.305	0.678*	0.464**	-1.093**	0.107	-0.235	0.180
	(0.375)	(0.155)	(0.535)	(0.226)	(0.216)	(0.296)	(0.366)	(0.198)	(0.537)	(0.233)	(0.229)	(0.355)

Age 45-49	-0.260	0.271*	-0.315	0.303	0.125	0.004	0.553	0.409**	-0.828	0.188	0.093	-0.124
	(0.371)	(0.153)	(0.564)	(0.226)	(0.221)	(0.299)	(0.361)	(0.178)	(0.568)	(0.231)	(0.224)	(0.359)
Age 50-54	-0.148	0.244	-0.800	0.479**	-0.418**	0.0001	0.613*	0.313**	-1.118*	0.409*	-0.451**	-0.094
	(0.372)	(0.149)	(0.586)	(0.242)	(0.205)	(0.323)	(0.361)	(0.159)	(0.581)	(0.241)	(0.211)	(0.352)
Age 55-59	-0.080	0.165	-0.756	-0.215	-0.187	0.082	0.344	0.251	-1.151*	-0.267	-0.220	-0.001
	(0.388)	(0.149)	(0.662)	(0.251)	(0.219)	(0.323)	(0.369)	(0.161)	(0.657)	(0.248)	(0.223)	(0.345)
Months in current job	0.029	0.0003	0.002*	0.072	-0.0004	0.002***	0.059	0.0003	0.002*	0.071	-0.0004	0.002***
	(0.074)	(0.000)	(0.001)	(0.066)	(0.000)	(0.001)	(0.069)	(0.000)	(0.001)	(0.064)	(0.000)	(0.001)
Years of education	0.064***	0.072***	0.091***	0.046***	0.042**	0.061***	0.084***	0.103***	0.061***	0.044***	0.034	0.060***
	(0.013)	(0.012)	(0.016)	(0.011)	(0.018)	(0.012)	(0.013)	(0.023)	(0.018)	(0.010)	(0.024)	(0.012)
Has an industry or govt certificate	-0.060	-0.023	-0.054	0.402**	0.135	0.022	-0.001	-0.029	-0.057	0.403**	0.138	0.017
	(0.232)	(0.078)	(0.187)	(0.201)	(0.134)	(0.149)	(0.230)	(0.077)	(0.180)	(0.197)	(0.130)	(0.147)
Participate in a training	0.205**	0.221***	0.226	0.088	0.106	0.497***	0.202**	0.236***	0.271	0.086	0.101	0.497***
	(0.087)	(0.076)	(0.183)	(0.070)	(0.127)	(0.121)	(0.083)	(0.077)	(0.180)	(0.068)	(0.123)	(0.119)
Married	0.053	0.069	0.063	0.057	0.101	0.050	-0.177	-0.023	0.210	0.035	0.069	-0.004
	(0.103)	(0.064)	(0.126)	(0.080)	(0.104)	(0.111)	(0.113)	(0.087)	(0.136)	(0.080)	(0.121)	(0.140)
High skilled white collar	0.338***	-0.005	-0.280	0.490***	0.411***	-0.274	0.333***	-0.028	-0.245	0.494***	0.411***	-0.277
	(0.130)	(0.121)	(0.229)	(0.106)	(0.148)	(0.172)	(0.120)	(0.121)	(0.218)	(0.104)	(0.142)	(0.169)
Low skilled	-0.047	-0.205*	-0.806***	0.100	-0.408***	-0.719***	-0.053	-0.212*	-0.801***	0.100	-0.409***	-0.724***

white collar	(0.100)	(0.121)	(0.186)	(0.092)	(0.153)	(0.162)	(0.092)	(0.118)	(0.175)	(0.090)	(0.147)	(0.159)
Machine operator	-0.045	-0.233	-0.372	0.182**	0.069	-0.380**	-0.005	-0.238	-0.363	0.182**	0.069	-0.381**
	(0.126)	(0.230)	(0.268)	(0.086)	(0.151)	(0.151)	(0.116)	(0.223)	(0.252)	(0.084)	(0.146)	(0.148)
Asset wealth index	0.065	0.168***	0.111	0.071**	0.144***	0.088	0.067	0.169***	0.130*	0.075**	0.142***	0.091
	(0.043)	(0.034)	(0.075)	(0.034)	(0.045)	(0.059)	(0.041)	(0.033)	(0.071)	(0.034)	(0.043)	(0.058)
Sigma							0.885***	0.772***	1.030***	0.630***	0.673***	0.925***
							(0.049)	(0.124)	(0.086)	(0.023)	(0.037)	(0.048)
Rho							0.822***	0.605**	-0.656***	-0.257*	-0.156	-0.243
							(0.039)	(0.267)	(0.117)	(0.142)	(0.324)	(0.377)
R-square	0.286	0.2269	0.448	0.290	0.346	0.276	--	--	--	--	--	--

Continued 2 (Kenya, Laos and Macedonia)

Variable	Panel A: OLS						Panel B: Heckman[a]					
	Female			Male			Female			Male		
	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD
Intercept	0.414	0.325	0.758***	0.098	0.345	0.803***	0.454	0.671	-0.534***	0.111	0.150	0.799
	(0.470)	(0.532)	(0.152)	(0.182)	(0.341)	(0.148)	(0.664)	(0.803)	(0.198)	(0.240)	(0.395)	(0.507)
Age 15-19	-1.316***	-0.550	-0.014	-0.342	0.642*	-0.646***	-1.296***	-0.503	-0.205	-0.338	0.601*	-0.645***
	(0.498)	(0.583)	(0.336)	(0.219)	(0.363)	(0.218)	(0.496)	(0.569)	(0.308)	(0.237)	(0.356)	(0.245)
Age 20-24	-0.838*	-0.240	-0.297**	-0.037	0.645*	0.030	-0.834*	-0.331	-0.278*	-0.039	0.666*	0.031
	(0.467)	(0.550)	(0.147)	(0.164)	(0.356)	(0.133)	(0.462)	(0.554)	(0.144)	(0.162)	(0.347)	(0.133)
Age 25-29	-0.764*	-0.085	-0.284**	0.008	0.760**	-0.188*	-0.770	-0.219	-0.046	0.001	0.844**	-0.187
	(0.463)	(0.552)	(0.123)	(0.158)	(0.332)	(0.111)	(0.481)	(0.582)	(0.125)	(0.172)	(0.336)	(0.181)
Age 30-34	-0.656	-0.026	-0.140	0.122	0.659**	-0.065	-0.668	-0.177	0.187	0.115	0.767**	-0.063
	(0.465)	(0.546)	(0.114)	(0.158)	(0.327)	(0.105)	(0.505)	(0.591)	(0.119)	(0.172)	(0.340)	(0.209)
Age 35-39	-0.518	-0.021	-0.118	-0.057	0.831**	-0.117	-0.533	-0.200	0.253**	-0.063	0.950***	-0.115
	(0.471)	(0.539)	(0.112)	(0.162)	(0.324)	(0.103)	(0.521)	(0.609)	(0.119)	(0.168)	(0.342)	(0.203)
Age 40-44	-0.288	-0.211	-0.242**	0.245	0.773**	-0.003	-0.304	-0.380	0.154	0.240	0.884***	-0.001
	(0.473)	(0.541)	(0.111)	(0.175)	(0.329)	(0.102)	(0.529)	(0.603)	(0.119)	(0.179)	(0.343)	(0.195)
Age 45-49	-0.471	-0.100	-0.150	0.111	0.704**	-0.133	-0.487	-0.248	0.224*	0.105	0.822**	-0.131

	(0.482)	(0.548)	(0.108)	(0.182)	(0.325)	(0.100)	(0.540)	(0.591)	(0.116)	(0.188)	(0.342)	(0.187)
Age 50-54	-0.280	0.067	-0.131	0.119	0.843**	-0.113	-0.291	-0.063	0.302***	0.115	0.949***	-0.112
	(0.531)	(0.551)	(0.105)	(0.213)	(0.345)	(0.102)	(0.560)	(0.580)	(0.116)	(0.214)	(0.356)	(0.183)
Age 55-59[b]	--	-0.296	-0.076	--	0.598*	-0.075	--	-0.388	0.212*	--	0.695*	-0.074
	--	(0.571)	(0.103)	--	(0.349)	(0.096)	--	(0.575)	(0.109)	--	(0.356)	(0.164)
Months in current job	0.0005	0.0002	0.0005**	0.0008	0.00004	0.001***	0.0005	0.0002	0.001***	0.0008	0.00003	0.001***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of education	0.045***	0.031**	0.049***	0.033***	0.001	0.053***	0.044***	0.021	0.093***	0.033***	0.004	0.053***
	(0.010)	(0.012)	(0.007)	(0.007)	(0.010)	(0.007)	(0.013)	(0.021)	(0.008)	(0.007)	(0.011)	(0.014)
Has an industry or govt certificate	-0.007	0.432**	0.088*	0.038	0.114	0.037	-0.008	0.429**	0.078*	0.038	0.111	0.037
	(0.158)	(0.188)	(0.045)	(0.085)	(0.138)	(0.054)	(0.155)	(0.182)	(0.044)	(0.084)	(0.135)	(0.053)
Participate in a training	0.298**	0.001	0.152***	0.229***	-0.118	0.079	0.298**	0.001	0.154***	0.229***	-0.116	0.079
	(0.121)	(0.137)	(0.053)	(0.078)	(0.108)	(0.063)	(0.119)	(0.133)	(0.052)	(0.077)	(0.105)	(0.062)
Married	0.203**	0.161	-0.016	-0.022	-0.142	0.044	0.219	0.163*	0.004	-0.025	-0.104	0.044
	(0.084)	(0.101)	(0.041)	(0.064)	(0.121)	(0.047)	(0.169)	(0.098)	(0.046)	(0.078)	(0.126)	(0.059)
High skilled white collar	0.644***	-0.126	0.333***	0.711***	-0.062	0.178**	0.644***	-0.122	0.299***	0.711***	-0.069	0.178**
	(0.139)	(0.136)	(0.073)	(0.105)	(0.118)	(0.074)	(0.137)	(0.131)	(0.068)	(0.104)	(0.116)	(0.073)
Low skilled white collar	0.140	0.096	-0.045	-0.173*	-0.234*	-0.127*	0.140	0.098	-0.079	-0.173*	-0.235*	-0.127*
	(0.104)	(0.130)	(0.069)	(0.091)	(0.124)	(0.069)	(0.102)	(0.125)	(0.064)	(0.090)	(0.121)	(0.069)

Machine operator	0.405**	-0.102	-0.268***	0.202**	-0.146	-0.113*	0.405**	-0.096	-0.277***	0.202**	-0.151	-0.113*
	(0.179)	(0.195)	(0.073)	(0.096)	(0.132)	(0.067)	(0.176)	(0.188)	(0.067)	(0.095)	(0.129)	(0.066)
Asset wealth index	0.175***	0.210***	0.020	0.284***	0.055	0.071***	0.176***	0.213***	0.025	0.284***	0.054	0.071***
	(0.045)	(0.060)	(0.021)	(0.033)	(0.053)	(0.022)	(0.045)	(0.058)	(0.021)	(0.032)	(0.052)	(0.022)
Sigma							0.861***	0.693***	0.550***	0.750***	0.728***	0.484***
							(0.029)	(0.044)	(0.026)	(0.018)	(0.029)	(0.013)
Rho							-0.039	-0.216	0.802***	-0.014	0.196	0.002
							(0.366)	(0.376)	(0.042)	(0.219)	(0.213)	(0.481)
R-square	0.361	0.203	0.474	0.450	0.048	0.335	--	--	--	--	--	--

Continued 3 (Sri Lanka, Ukraine and Vietnam)

Variable	Panel A: OLS						Panel B: Heckman[a]					
	Female			Male			Female			Male		
	LK	UA	VN	LK	UA	VN	LK	UA	VN	LK	UA	VN
Intercept	-0.500**	-0.250	-0.700**	0.046	0.427	0.413*	-0.280	-1.218***	-0.954**	0.258	0.452	0.537**
	(0.249)	(0.157)	(0.334)	(0.248)	(0.282)	(0.215)	(0.448)	(0.222)	(0.409)	(0.291)	(0.547)	(0.268)
Age 15-19	-0.294	0.025	0.236	0.241	0.426	-0.503**	-0.200	-0.172	0.241	0.294	0.426	-0.485**
	(0.348)	(0.316)	(0.388)	(0.279)	(0.304)	(0.238)	(0.372)	(0.298)	(0.382)	(0.276)	(0.295)	(0.235)
Age 20-24	0.308	0.098	0.633*	0.200	0.421**	-0.147	0.325	0.183*	0.752**	0.097	0.411	-0.184
	(0.289)	(0.108)	(0.331)	(0.237)	(0.196)	(0.188)	(0.282)	(0.109)	(0.346)	(0.245)	(0.263)	(0.191)
Age 25-29	0.397	0.036	0.944***	0.515**	0.495***	-0.034	0.375	0.260***	1.109***	0.351	0.482	-0.112
	(0.265)	(0.087)	(0.329)	(0.215)	(0.180)	(0.179)	(0.261)	(0.095)	(0.361)	(0.244)	(0.306)	(0.205)
Age 30-34	0.467*	0.148*	0.785**	0.367*	0.656***	-0.134	0.449*	0.453***	0.955***	0.204	0.643**	-0.211
	(0.256)	(0.085)	(0.327)	(0.208)	(0.186)	(0.176)	(0.251)	(0.100)	(0.361)	(0.238)	(0.305)	(0.201)
Age 35-39	0.234	0.172**	0.945***	0.350*	0.530***	0.067	0.176	0.512***	1.108***	0.200	0.519*	-0.017
	(0.244)	(0.085)	(0.326)	(0.208)	(0.183)	(0.174)	(0.258)	(0.103)	(0.357)	(0.233)	(0.273)	(0.204)
Age 40-44	0.359	0.143*	0.817**	0.371*	0.465**	-0.088	0.314	0.508***	0.966***	0.224	0.455*	-0.157
	(0.246)	(0.084)	(0.330)	(0.204)	(0.190)	(0.179)	(0.251)	(0.105)	(0.355)	(0.229)	(0.260)	(0.199)
Age 45-49	0.546**	0.139*	0.661**	0.441**	0.355*	-0.045	0.477*	0.495***	0.810**	0.310	0.345	-0.117

	(0.236)	(0.080)	(0.331)	(0.212)	(0.189)	(0.178)	(0.259)	(0.101)	(0.356)	(0.230)	(0.257)	(0.200)
Age 50-54	0.340	0.194**	0.619*	0.298	0.324*	-0.076	0.297	0.489***	0.740**	0.175	0.314	-0.129
	(0.246)	(0.079)	(0.332)	(0.217)	(0.184)	(0.188)	(0.251)	(0.093)	(0.347)	(0.233)	(0.259)	(0.199)
Age 55-59	0.564**	0.163*	0.812**	0.454*	0.260	-0.181	0.520**	0.267***	0.889**	0.393*	0.252	-0.220
	(0.254)	(0.086)	(0.344)	(0.236)	(0.183)	(0.191)	(0.260)	(0.088)	(0.347)	(0.237)	(0.234)	(0.195)
Months in current job	0.001	0.0004**	0.0006	0.0002	0.0004	0.001***	0.001	0.0004**	0.001*	0.0002	0.0004	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of education	0.065***	0.073***	0.071***	0.043***	0.009	0.061***	0.059***	0.106***	0.075***	0.044***	0.008	0.060***
	(0.016)	(0.011)	(0.011)	(0.013)	(0.017)	(0.009)	(0.018)	(0.013)	(0.012)	(0.012)	(0.019)	(0.009)
Has an industry or govt certificate	0.117	0.111	0.012	-0.068	-0.007	0.077	0.115	0.093	0.009	-0.071	-0.006	0.078
	(0.169)	(0.077)	(0.069)	(0.110)	(0.095)	(0.063)	(0.164)	(0.073)	(0.068)	(0.108)	(0.092)	(0.062)
Participate in a training	0.213*	0.047	0.097	-0.048	0.261	-0.029	0.213*	0.020	0.098	-0.052	0.260	-0.028
	(0.125)	(0.098)	(0.096)	(0.127)	(0.214)	(0.104)	(0.122)	(0.097)	(0.095)	(0.125)	(0.208)	(0.103)
Married	0.043	-0.041	-0.023	0.061	0.125*	-0.067	0.084	-0.071	-0.034	0.024	0.123	-0.078
	(0.107)	(0.042)	(0.070)	(0.104)	(0.073)	(0.077)	(0.126)	(0.045)	(0.070)	(0.106)	(0.077)	(0.078)
High skilled white collar	0.193	0.128*	0.049	0.389***	0.329**	0.090	0.189	0.147**	0.051	0.394***	0.328**	0.090
	(0.156)	(0.067)	(0.124)	(0.124)	(0.134)	(0.107)	(0.151)	(0.064)	(0.122)	(0.122)	(0.130)	(0.105)
Low skilled white collar	-0.220	-0.068	-0.097	-0.063	-0.132	-0.290***	-0.222	-0.047	-0.095	-0.060	-0.132	-0.291***
	(0.159)	(0.065)	(0.109)	(0.109)	(0.148)	(0.101)	(0.155)	(0.061)	(0.108)	(0.108)	(0.143)	(0.099)

Machine operator	0.240	0.193***	-0.179	0.210**	0.293**	-0.018	0.237	0.203***	-0.176	0.210**	0.292**	-0.019
	(0.151)	(0.074)	(0.112)	(0.089)	(0.122)	(0.095)	(0.147)	(0.069)	(0.110)	(0.088)	(0.119)	(0.093)
Asset wealth index	0.230***	0.020	0.033	0.184***	-0.001	0.037	0.231***	0.020	0.031	0.185***	-0.001	0.038
	(0.071)	(0.019)	(0.034)	(0.052)	(0.032)	(0.032)	(0.069)	(0.019)	(0.033)	(0.051)	(0.031)	(0.031)
Sigma							0.772***	0.511***	0.761***	0.776***	0.520***	0.659***
							(0.039)	(0.029)	(0.022)	(0.026)	(0.021)	(0.020)
Rho							-0.162	0.753***	0.139	-0.250	-0.020	-0.109
							(0.270)	(0.074)	(0.131)	(0.183)	(0.386)	(0.144)
R-square	0.316	0.227	0.251	0.164	0.160	0.288	--	--	--	--	--	--

Table A. 4 Summary statistics for wage employees, by country[a]

Variable	CH	AM	BO	CO	GE	GH	KE	LA	MKD	LK	UA	VN
Hourly wage in US dollars	1.893	6.494	4.735	4.929	4.063	2.975	3.491	3.328	5.559	4.082	3.559	4.871
	(2.589)	(59.548)	(8.586)	(10.954)	(4.633)	(7.102)	(7.591)	(5.497)	(6.775)	(9.724)	(2.322)	(37.948)
Log of hourly wage	0.377	0.923	1.102	1.140	1.070	0.408	0. 642	0.804	1.498	0.905	1.112	1.025
	(0.649)	(0.736)	(0.907)	(0.782)	(0.795)	(1.125)	(1. 031)	(0.789)	(0.599)	(0.879)	(0.543)	(0.840)
Female dummy = 1	0.494	0.649	0.498	0.483	0.653	0.360	0.369	0.448	0.486	0.371	0.655	0.554
	(0.500)	(0.478)	(0.500)	(0.500)	(0.476)	(0.480)	(0.483)	(0.498)	(0.500)	(0.483)	(0.476)	(0.497)
Public sector = 2, private sector = 1, and others = 0	1.414	1.663	1.198	1.088	1.544	1.317	1.117	1.488	1.430	1.368	1.509	1.450
	(0.493)	(0.473)	(0.399)	(0.284)	(0.498)	(0.466)	(0.322)	(0.500)	(0.495)	(0.483)	(0.500)	(0.498)
Public sector dummy = 1	0.414	0.663	0.198	0.088	0.544	0.317	0.117	0.488	0.430	0.368	0.509	0.450
	(0.493)	(0.473)	(0.399)	(0.284)	(0.498)	(0.466)	(0.322)	(0.500)	(0.495)	(0.483)	(0.500)	(0.498)
Public sector*Female	0.207	0.469	0.113	0.043	0.390	0.110	0.042	0.200	0.214	0.170	0.378	0.262
	(0.406)	(0.499)	(0.317)	(0.203)	(0.488)	(0.313)	(0.201)	(0.400)	(0.410)	(0.376)	(0.485)	(0.440)
Age	39.525	41.578	32.301	34.747	41.411	33.212	30.900	35.221	41.425	38.490	41.430	37.119
	(9.530)	(12.821)	(11.616)	(11.241)	(12.038)	(10.847)	(9.172)	(11.082)	(11.176)	(11.393)	(12.052)	(10.872)
Age square/100	16.530	18.929	11.781	13.336	18.596	12.206	10.389	13.631	18.408	16.112	18.616	14.959
	(7.608)	(10.732)	(8.534)	(8.547)	(10.154)	(8.463)	(6.750)	(8.300)	(9.428)	(9.130)	(10.088)	(8.547)
Age cube/1000	72.502	92.325	47.804	55.818	89.096	49.594	38.205	57.069	86.692	72.278	89.161	64.711
	(3.361)	(72.124)	(52.013)	(52.896)	(68.741)	(53.791)	(40.667)	(50.842)	(63.249)	(59.355)	(67.650)	(54.159)

Years of education	13.134	14.145	12.221	10.777	15.590	11.186	10.181	10.964	13.384	9.607	13.573	12.084
	(3.361)	(3.071)	(4.292)	(3.691)	(2.835)	(5.223)	(4.714)	(5.320)	(3.470)	(3.895)	(2.196)	(4.273)
Number of months in current job/10	10.431	11.808	5.860	0.158	10.788	6.612	5.180	10.776	13.979	11.939	11.792	10.889
	(10.817)	(12.560)	(8.493)	(0.049)	(12.154)	(8.646)	(6.101)	(10.818)	(13.063)	(11.811)	(11.994)	(10.624)
Has labor contract dummy = 1	0.684	0.889	0.472	0.650	0.800	0.547	0.500	0.413	1.000	0.464	0.995	0.749
	(0.465)	(0.314)	(0.499)	(0.477)	(0.400)	(0.498)	(0.500)	(0.493)	(0.000)	(0.499)	(0.074)	(0.434)
Has an industry or govt certificate dummy = 1	0.287	0.090	0.282	0.024	0.171	0.100	0.098	0.083	0.177	0.095	0.080	0.303
	(0.453)	(0.286)	(0.450)	(0.154)	(0.377)	(0.300)	(0.297)	(0.276)	(0.382)	(0.294)	(0.271)	(0.460)
Participated in a training dummy = 1	0.175	0.150	0.287	0.242	0.216	0.173	0.167	0.153	0.126	0.105	0.028	0.094
	(0.380)	(0.357)	(0.453)	(0.429)	(0.411)	(0.378)	(0.373)	(0.360)	(0.332)	(0.307)	(0.166)	(0.292)
Married dummy = 1	0.808	0.611	0.320	0.192	0.622	0.432	0.514	0.692	0.708	0.740	0.702	0.706
	(0.394)	(0.488)	(0.467)	(0.394)	(0.485)	(0.496)	(0.500)	(0.462)	(0.455)	(0.439)	(0.458)	(0.456)
Manager dummy = 1	0.040	0.058	0.047	0.025	0.087	0.025	0.021	0.072	0.027	0.062	0.068	0.030
	(0.197)	(0.234)	(0.212)	(0.158)	(0.282)	(0.157)	(0.142)	(0.258)	(0.161)	(0.241)	(0.251)	(0.170)
Professional dummy = 1	0.244	0.505	0.331	0.177	0.470	0.331	0.236	0.316	0.374	0.235	0.413	0.368
	(0.430)	(0.500)	(0.471)	(0.382)	(0.499)	(0.471)	(0.425)	(0.465)	(0.484)	(0.424)	(0.493)	(0.483)
Clerical dummy = 1	0.207	0.097	0.084	0.148	0.070	0.060	0.083	0.057	0.084	0.090	0.048	0.095
	(0.405)	(0.296)	(0.277)	(0.356)	(0.255)	(0.237)	(0.276)	(0.231)	(0.278)	(0.286)	(0.214)	(0.293)
Service dummy = 1	0.252	0.129	0.169	0.220	0.176	0.235	0.309	0.138	0.187	0.087	0.122	0.172
	(0.434)	(0.335)	(0.375)	(0.415)	(0.381)	(0.424)	(0.462)	(0.345)	(0.390)	(0.282)	(0.328)	(0.377)

Other occupations dummy = 1[b]	0.257	0.209	0.370	0.429	0.196	0.349	0.351	0.418	0.329	0.526	0.344	0.335
	(0.437)	(0.407)	(0.483)	(0.495)	(0.397)	(0.477)	(0.477)	(0.494)	(0.470)	(0.500)	(0.475)	(0.472)
Asset wealth index	0.024	0.091	-0.040	-0.091	-0.085	0.189	0.015	0.150	-0.059	-0.010	-0.045	-0.110
	(0.977)	(0.935)	(0.999)	(0.970)	(0.973)	(0.932)	(1.016)	(0.841)	(0.916)	(0.674)	(0.970)	(1.069)
Number of children under 6 year old	0.131	0.288	0.512	0.366	0.330	0.425	0.454	0.532	0.294	0.418	0.184	0.403
	(0.340)	(0.599)	(0.778)	(0.649)	(0.622)	(0.713)	(0.696)	(0.697)	(0.594)	(0.624)	(0.446)	(0.660)
Has chronic illness dummy = 1	0.119	0.164	0.187	0.149	0.142	0.074	0.039	0.103	0.084	0.108	0.342	0.165
	(0.324)	(0.371)	(0.390)	(0.357)	(0.349)	(0.263)	(0.193)	(0.304)	(0.278)	(0.310)	(0.475)	(0.371)
Head of family dummy = 1	0.442	0.369	0.393	0.486	0.382	0.699	0.719	0.396	0.351	0.492	0.193	0.393
	(0.497)	(0.483)	(0.489)	(0.500)	(0.486)	(0.459)	(0.450)	(0.489)	(0.477)	(0.500)	(0.395)	(0.489)
Number of observations	1041	846	895	904	761	753	1316	601	1345	893	916	1039

[a] The summary statistics are described as mean value of each variable, with standard deviation in parentheses.
[b] Implies reference categories in the estimated equations.

Table A. 5 Multinomial logit estimates for likelihood of female participation in public sector or private sector, by country

Variable[a]	CH		AM		BO		CO		GE		GH	
	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-
Intercept	-13.57***	-11.75***	-10.14***	-7.429***	-19.19***	-5.717***	-18.83***	-8.039***	-12.08***	-14.23***	-11.71***	-13.28***
	(4.679)	(2.964)	(2.166)	(2.438)	(4.407)	(1.647)	(6.115)	(1.592)	(2.719)	(2.605)	(4.281)	(2.483)
Age	0.262	0.603**	0.262	0.280	0.901**	0.287*	0.735	0.500***	0.474**	0.855***	0.391	0.900***
	(0.391)	(0.253)	(0.173)	(0.211)	(0.362)	(0.160)	(0.497)	(0.146)	(0.212)	(0.215)	(0.370)	(0.224)
Age^2	0.174	-1.093	-0.295	-0.394	-1.684*	-0.351	-1.358	-0.922**	-0.869*	-1.975***	-0.567	-1.988***
	(1.027)	(0.667)	(0.431)	(0.554)	(0.934)	(0.466)	(1.285)	(0.407)	(0.517)	(0.552)	(0.990)	(0.620)
Age^3	-0.081	0.047	0.003	0.007	0.095	-0.007	0.070	0.042	0.050	0.139***	0.015	0.133**
	(0.087)	(0.056)	(0.034)	(0.046)	(0.077)	(0.042)	(0.106)	(0.036)	(0.040)	(0.045)	(0.084)	(0.054)
Years of education	0.442***	0.207***	0.279***	0.075**	0.309***	0.065***	0.397***	0.050**	0.198***	0.107***	0.250***	0.056***
	(0.038)	(0.029)	(0.023)	(0.030)	(0.038)	(0.020)	(0.065)	(0.020)	(0.026)	(0.029)	(0.034)	(0.018)
Married	-0.081	-0.071	-0.543***	-1.254***	-0.824***	-0.732***	-0.384	-0.686***	-0.336**	-0.442**	0.504	-0.375
	(0.307)	(0.268)	(0.150)	(0.208)	(0.309)	(0.204)	(0.460)	(0.206)	(0.164)	(0.186)	(0.339)	(0.239)
Number of children	-0.472	-0.484*	-0.353***	0.165	-0.091	0.039	-0.404	-0.163	-0.278**	-0.350**	-0.309	-0.317**
	(0.316)	(0.261)	(0.118)	(0.140)	(0.196)	(0.103)	(0.417)	(0.117)	(0.121)	(0.140)	(0.195)	(0.127)
Has a chronic illness	-0.361	-0.401	-0.178	0.235	0.046	0.341*	0.691*	-0.091	-0.468***	-0.348	-0.017	-0.379
	(0.309)	(0.270)	(0.163)	(0.236)	(0.310)	(0.197)	(0.402)	(0.178)	(0.173)	(0.218)	(0.473)	(0.400)
Head of	0.173	0.056	-0.345	-0.190	0.477	0.749***	0.418	0.397**	-0.051	0.475**	1.164***	0.455**

family	(0.209)	(0.182)	(0.163)	(0.231)	(0.360)	(0.232)	(0.418)	(0.171)	(0.188)	(0.208)	(0.302)	(0.219)
LR	416.19		314.9		278.8		239.24		248.85		248.66	
Observations	216	298	397	152	101	345	39	398	297	200	83	188

[a] The dependent variable is a count variable that equals 2 if individual is working in public sector, or equals 1 if working in private sector; else equals 0.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued

Variable[a]	KE		LA		MKD		LK		UA		VN	
	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-
Intercept	-19.30***	-7.961***	-15.29***	-13.12***	-9.171**	-11.52***	-8.913***	-10.31***	-17.59***	-11.23***	-17.53***	-19.45***
	(6.085)	(2.073)	(4.337)	(2.670)	(3.777)	(2.462)	(3.306)	(2.175)	(3.140)	(2.675)	(2.930)	(2.031)
Age	0.868*	0.436**	0.562	0.834***	-0.214	0.420**	0.006	0.714***	0.774***	0.510**	0.866***	1.520***
	(0.510)	(0.195)	(0.390)	(0.244)	(0.291)	(0.202)	(0.281)	(0.187)	(0.239)	(0.220)	(0.250)	(0.177)
Age^2	-1.708	-0.630	-0.756	-1.696**	1.357*	-0.483	0.645	-1.597***	-1.306**	-0.698	-1.405***	-3.556***
	(1.339)	(0.568)	(1.074)	(0.681)	(0.703)	(0.515)	(0.733)	(0.488)	(0.578)	(0.557)	(0.660)	(0.474)
Age^3	0.114	0.0094	0.012	0.098	-0.157***	-0.006	-0.096	0.113***	0.058	0.008	0.0470	0.251***
	(0.112)	(0.053)	(0.094)	(0.060)	(0.055)	(0.042)	(0.061)	(0.040)	(0.045)	(0.045)	(0.056)	(0.040)

Years of education	0.312***	0.034**	0.407***	0.072***	0.405***	0.209***	0.362***	-0.050*	0.343***	0.164***	0.262***	0.022
	(0.046)	(0.014)	(0.040)	(0.022)	(0.024)	(0.020)	(0.034)	(0.026)	(0.037)	(0.040)	(0.023)	(0.018)
Married	-0.527	-0.834***	-0.328	0.087	0.257	0.328*	-0.571*	-0.890***	-0.037	-0.163	-0.067	-0.509***
	(0.382)	(0.156)	(0.342)	(0.263)	(0.216)	(0.189)	(0.294)	(0.223)	(0.171)	(0.183)	(0.204)	(0.179)
Number of children	-0.164	-0.121	-0.070	-0.369**	-0.012	-0.498***	-0.247	-0.562***	-0.739***	-0.829***	-0.242*	-0.298**
	(0.225)	(0.087)	(0.206)	(0.156)	(0.143)	(0.130)	(0.185)	(0.174)	(0.174)	(0.186)	(0.127)	(0.117)
Has a chronic illness	-0.394	0.052	-0.016	-0.071	-0.384	-0.227	-0.263	-0.720***	-0.352**	-0.304*	-0.058	-0.608***
	(0.688)	(0.251)	(0.403)	(0.320)	(0.243)	(0.230)	(0.293)	(0.267)	(0.160)	(0.176)	(0.198)	(0.195)
Head of family	0.372	0.640***	-0.081	0.124	0.466*	0.193	-0.281	-0.161	-0.063	-0.196	0.140	0.512***
	(0.358)	(0.150)	(0.466)	(0.358)	(0.258)	(0.250)	(0.302)	(0.240)	(0.218)	(0.245)	(0.187)	(0.178)
LR	310.49		394.94		780.19		290.43		430.09		682.16	
Observations	55	431	120	149	288	365	152	179	345	254	343	382

Table A. 6 Multinomial logit estimates for likelihood of male participation in public sector or private sector, by country

Variable[a]	CH		AM		BO		CO		GE		GH	
	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-
Intercept	-15.70***	-8.818***	-12.85***	-9.230***	-18.65***	-6.337***	-18.41***	-18.13***	-11.30***	-9.670***	-17.05***	-14.21***
	(3.785)	(2.714)	(3.114)	(2.591)	(5.272)	(2.049)	(6.287)	(2.249)	(3.373)	(2.568)	(4.049)	(2.350)
Age	0.767**	0.473**	0.636**	0.502**	0.923**	0.432	0.834	1.485***	0.464*	0.494**	0.866**	1.037***
	(0.310)	(0.229)	(0.256)	(0.225)	(0.442)	(0.211)	(0.522)	(0.202)	(0.277)	(0.223)	(0.342)	(0.216)
Age^2	-1.439*	-0.693	-1.449**	-1.126*	-1.558	-0.460	-1.579	-3.469***	-1.022	-1.215**	-1.602*	-2.189***
	(0.792)	(0.591)	(0.647)	(0.595)	(1.144)	(0.615)	(1.348)	(0.543)	(0.693)	(0.581)	(0.891)	(0.599)
Age^3	0.073	0.016	0.106**	0.078	0.067	-0.020	0.085	0.245***	0.071	0.088*	0.087	0.140***
	(0.065)	(0.048)	(0.052)	(0.049)	(0.094)	(0.055)	(0.111)	(0.046)	(0.055)	(0.048)	(0.074)	(0.052)
Years of education	0.324***	0.102***	0.227***	0.105***	0.177***	-0.060	0.303***	-0.008	0.200***	0.147***	0.171***	-0.034
	(0.036)	(0.029)	(0.034)	(0.034)	(0.052)	(0.038)	(0.063)	(0.029)	(0.040)	(0.036)	(0.031)	(0.022)
Married	-0.140	-0.415	0.703**	0.033	1.181**	1.250***	0.456	0.572*	0.282	0.670**	0.732**	0.681**
	(0.336)	(0.285)	(0.307)	(0.302)	(0.519)	(0.452)	(0.465)	(0.297)	(0.280)	(0.267)	(0.346)	(0.294)
Number of children	0.218	0.609**	-0.199	0.203	-0.056	0.353**	1.063***	0.593***	0.312*	0.235	0.234	-0.002
	(0.355)	(0.291)	(0.195)	(0.180)	(0.279)	(0.165)	(0.310)	(0.210)	(0.187)	(0.171)	(0.205)	(0.169)
Has a chronic illness	0.084	0.058	-0.852***	-0.651**	-0.327	0.360	-0.297	-0.493*	-1.099***	-0.602*	0.070	0.191
	(0.313)	(0.265)	(0.313)	(0.332)	(0.498)	(0.317)	(0.559)	(0.299)	(0.364)	(0.311)	(0.49)	(0.405)
Head of	0.202	-0.008	-0.060	0.283	1.726***	1.064***	0.803	0.443*	0.328	0.101	1.197***	0.501**

family	(0.218)	(0.186)	(0.255)	(0.265)	(0.455)	(0.303)	(0.511)	(0.252)	(0.257)	(0.230)	(0.368)	(0.238)
LR	268.41		152.48		353.99		302.42		148.15		446.26	
Observations	215	312	163	133	76	373	41	426	117	147	156	326

[a] The dependent variable equals 2 if individual is working in public sector, or equals 1 if working in private sector; else equals 0.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued

Variable[a]	KE		LA		MKD		LK		UA		VN	
	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-	Public-	Private-
Intercept	-26.05***	-12.83***	-10.34***	-4.318*	-10.90***	-11.74***	-22.20***	-14.19***	-16.14***	-15.24***	-21.46***	-18.38***
	(4.863)	(1.842)	(3.908)	(2.429)	(3.028)	(2.017)	(3.826)	(2.225)	(3.593)	(2.838)	(3.518)	(2.261)
Age	1.574***	0.967***	0.293	0.138	0.251	0.658***	1.428***	1.237***	0.940***	0.947***	1.202***	1.417***
	(0.404)	(0.166)	(0.349)	(0.241)	(0.239)	(0.170)	(0.315)	(0.202)	(0.296)	(0.244)	(0.290)	(0.201)
Age^2	-3.595***	-2.205***	-0.157	0.370	-0.035	-1.253***	-2.991***	-2.794***	-1.984***	-2.125***	-2.304***	-3.104
	(1.052)	(0.455)	(0.950)	(0.713)	(0.590)	(0.438)	(0.800)	(0.543)	(0.751)	(0.632)	(0.735)	(0.539)
Age^3	0.258***	0.154***	-0.028	-0.086	-0.036	0.066*	0.188***	0.186***	0.125**	0.139***	0.126**	0.203***
	(0.087)	(0.039)	(0.081)	(0.065)	(0.046)	(0.036)	(0.065)	(0.045)	(0.060)	(0.052)	(0.059)	(0.045)

Years of education	0.238***	-0.025	0.243***	-0.059**	0.247***	0.093***	0.166***	-0.128***	0.198***	0.225***	0.228***	-0.021
	(0.038)	(0.016)	(0.036)	(0.029)	(0.024)	(0.021)	(0.040)	(0.035)	(0.057)	(0.051)	(0.030)	(0.024)
Married	0.347	0.476**	1.466***	0.076	0.503**	0.346*	0.319	0.517	-0.035	0.269	1.095***	0.191
	(0.339)	(0.202)	(0.415)	(0.354)	(0.215)	(0.183)	(0.444)	(0.375)	(0.315)	(0.284)	(0.327)	(0.263)
Number of children	0.259	0.133	-0.017	0.096	0.305**	-0.162	0.063	-0.062	-0.148	-0.281	-0.094	-0.250
	(0.227)	(0.139)	(0.207)	(0.167)	(0.139)	(0.131)	(0.236)	(0.205)	(0.271)	(0.250)	(0.163)	(0.159)
Has a chronic illness	0.770	-0.758*	-0.674	-1.425**	-0.248	-0.708***	-0.928***	-1.030***	-0.905***	-0.553**	-0.142	-0.221
	(0.576)	(0.422)	(0.536)	(0.555)	(0.254)	(0.267)	(0.342)	(0.292)	(0.273)	(0.237)	(0.268)	(0.249)
Head of family	0.677*	1.074***	0.944**	0.778**	0.045	0.303*	0.815**	0.595*	1.155***	1.037***	-0.041	0.208
	(0.372)	(0.176)	(0.440)	(0.393)	(0.206)	(0.180)	(0.408)	(0.360)	(0.295)	(0.274)	(0.232)	(0.211)
LR	513.02		451.73		442.59		407.28		193.8		577.63	
Observations	99	731	173	159	290	402	177	385	120	196	246	338

Table A. 7 Public- and private- sector wage equation for women with OLS and selection model, by country (China, Armenia and Bolivia)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	CH	AM	BO	CH	AM	BO	CH	AM	BO	CH	AM	BO
Intercept	-1.721	0.922	-0.639	0.163	-0.679	0.356	-5.056**	0.857	-10.222	0.792	-6.956	-1.841
	(1.603)	(1.206)	(3.421)	(1.485)	(3.099)	(1.019)	(2.393)	(1.730)	(9.083)	(1.718)	(5.562)	(1.511)
Age	0.080	-0.128	0.071	-0.026	-0.020	0.042	0.011	-0.127	0.377	-0.055	0.230	0.166
	(0.131)	(0.093)	(0.268)	(0.125)	(0.262)	(0.096)	(0.135)	(0.095)	(0.379)	(0.131)	(0.320)	(0.115)
Age^2	-0.239	0.343	-0.163	0.086	0.120	-0.156	0.188	0.343	-0.678	0.139	-0.381	-0.414
	(0.344)	(0.227)	(0.680)	(0.332)	(0.680)	(0.280)	(0.411)	(0.228)	(0.816)	(0.340)	(0.772)	(0.308)
Age^3	0.020	-0.029	0.010	-0.010	-0.013	0.016	-0.033	-0.029	0.036	-0.012	0.016	0.031
	(0.029)	(0.018)	(0.055)	(0.028)	(0.056)	(0.025)	(0.041)	(0.018)	(0.060)	(0.028)	(0.060)	(0.026)
Months in current job	0.016***	0.001	0.023**	0.002	-0.022	0.012	0.016***	0.001	0.023**	0.002	-0.023*	0.013
	(0.003)	(0.003)	(0.010)	(0.004)	(0.013)	(0.009)	(0.003)	(0.003)	(0.010)	(0.004)	(0.013)	(0.009)
Years of education	0.082***	0.066***	0.043	0.031**	0.101***	0.001	0.208***	0.068**	0.207	0.029**	0.116***	-0.001
	(0.012)	(0.012)	(0.027)	(0.013)	(0.037)	(0.013)	(0.069)	(0.034)	(0.146)	(0.013)	(0.038)	(0.013)
Has a labor contract	0.036	0.331*	0.152	0.194***	0.042	0.143	0.057	0.330	0.141	0.191***	0.030	0.149
	(0.090)	(0.201)	(0.186)	(0.071)	(0.211)	(0.102)	(0.090)	(0.201)	(0.186)	(0.071)	(0.211)	(0.102)
Has an govt certificate	0.091	-0.077	0.202	0.047	0.188	0.044	0.102	-0.077	0.193	0.048	0.208	0.038
	(0.062)	(0.103)	(0.128)	(0.073)	(0.244)	(0.108)	(0.062)	(0.103)	(0.128)	(0.073)	(0.244)	(0.107)

Participated in a training	0.071	0.064	-0.129	0.168*	-0.195	0.151	0.066	0.064	-0.113	0.172*	-0.247	0.154
	(0.068)	(0.071)	(0.124)	(0.089)	(0.308)	(0.105)	(0.068)	(0.071)	(0.125)	(0.089)	(0.310)	(0.105)
Married	0.071	-0.008	0.123	-0.190**	-0.133	0.144	0.036	-0.010	-0.155	-0.175*	-0.743	-0.039
	(0.083)	(0.060)	(0.141)	(0.093)	(0.188)	(0.104)	(0.084)	(0.073)	(0.282)	(0.095)	(0.487)	(0.139)
Manager	0.316*	0.159	0.968	0.078	0.064	0.634	0.316*	0.159	1.005*	0.069	0.044	0.595**
	(0.172)	(0.180)	(0.595)	(0.219)	(0.514)	(0.282)	(0.171)	(0.181)	(0.595)	(0.220)	(0.513)	(0.281)
Professional	0.048	0.087	0.199	0.132	0.216	0.123	0.031	0.088	0.211	0.130	0.159	0.091
	(0.093)	(0.111)	(0.363)	(0.106)	(0.310)	(0.141)	(0.093)	(0.112)	(0.363)	(0.107)	(0.312)	(0.141)
Clerical	-0.025	-0.084	0.212	-0.045	0.283	0.163	-0.020	-0.083	0.245	-0.048	0.269	0.166
	(0.092)	(0.136)	(0.367)	(0.097)	(0.311)	(0.176)	(0.091)	(0.137)	(0.367)	(0.098)	(0.310)	(0.175)
Service	0.093	-0.098	-1.325***	-0.054	0.301	-0.157	0.091	-0.097	-1.355***	-0.051	0.268	-0.170*
	(0.097)	(0.145)	(0.431)	(0.094)	(0.265)	(0.103)	(0.097)	(0.145)	(0.431)	(0.094)	(0.266)	(0.103)
Asset wealth index	0.031	0.080**	0.092	0.082***	-0.111	0.225***	0.034	0.079**	0.106	0.079**	-0.094	0.224***
	(0.032)	(0.031)	(0.076)	(0.030)	(0.097)	(0.050)	(0.032)	(0.031)	(0.076)	(0.031)	(0.098)	(0.050)
Inverse Mill's ratio							0.910*	0.014**	1.423	-0.184	1.522	0.621*
							(0.487)	(0.271)	(1.250)	(0.252)	(1.121)	(0.316)
R-square	0.455	0.167	0.413	0.253	0.116	0.255	0.464	0.167	0.422	0.255	0.128	0.264
Observations	216	397	101	298	152	345	216	397	101	298	152	345

[a] Describes the estimates for the second stage of selection model, the estimates of first stage are reported in Table A.5.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued 1 (Colombia, Georgia and Ghana)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	CO	GE	GH	CO	GE	GH	CO	GE	GH	CO	GE	GH
Intercept	-4.051	0.317	-0.175	-1.153	4.227*	-2.834	-7.928	-1.476	2.166	-2.545	6.121*	3.688
	(6.505)	(1.678)	(5.275)	(1.026)	(2.198)	(2.060)	(9.098)	(2.706)	(5.943)	(2.085)	(3.480)	(3.954)
Age	0.371	-0.047	-0.081	0.116	-0.338*	0.184	0.456	-0.007	-0.124	0.187	-0.433*	-0.221
	(0.527)	(0.128)	(0.450)	(0.092)	(0.181)	(0.181)	(0.551)	(0.137)	(0.454)	(0.130)	(0.226)	(0.276)
Age^2	-0.821	0.117	0.349	-0.303	0.874*	-0.473	-0.937	0.066	0.392	-0.433	1.089**	0.451
	(1.375)	(0.310)	(1.218)	(0.256)	(0.456)	(0.500)	(1.406)	(0.316)	(1.221)	(0.307)	(0.550)	(0.690)
Age^3	0.051	-0.010	-0.036	0.026	-0.071*	0.040	0.054	-0.009	-0.036	0.032	-0.086**	-0.025
	(0.116)	(0.024)	(0.105)	(0.023)	(0.037)	(0.043)	(0.117)	(0.024)	(0.106)	(0.024)	(0.042)	(0.055)
Months in current job	4.911	0.001	0.007	-0.102	0.003	0.018	5.346	0.002	0.007	-0.140	0.003	0.020
	(4.327)	(0.004)	(0.020)	(0.734)	(0.008)	(0.014)	(4.440)	(0.004)	(0.020)	(0.736)	(0.008)	(0.014)
Years of education	0.196**	0.071***	0.087	0.051***	0.038	0.067***	0.272*	0.100***	0.034	0.057***	0.029	0.054***
	(0.083)	(0.016)	(0.053)	(0.013)	(0.024)	(0.017)	(0.149)	(0.038)	(0.081)	(0.015)	(0.027)	(0.019)
Has a labor contract	-0.586	0.150	-0.100	0.140*	0.186	0.164	-0.520	0.151	-0.118	0.143*	0.188	0.131
	(0.627)	(0.146)	(0.400)	(0.081)	(0.123)	(0.170)	(0.644)	(0.146)	(0.401)	(0.081)	(0.123)	(0.169)
Has an govt certificate	-0.165	-0.042	0.040	-0.017	0.002	-0.201	-0.190	-0.040	0.101	-0.040	0.014	-0.246
	(0.872)	(0.093)	(0.393)	(0.236)	(0.136)	(0.218)	(0.884)	(0.093)	(0.401)	(0.238)	(0.137)	(0.217)

Participated in a training	0.421	0.254***	-0.144	0.109	0.010	0.503**	0.385	0.253***	-0.154	0.111	0.011	0.586**
	(0.287)	(0.085)	(0.334)	(0.093)	(0.159)	(0.244)	(0.297)	(0.085)	(0.334)	(0.093)	(0.159)	(0.246)
Married	0.156	0.078	0.108	0.069	0.033	0.023	0.152	0.044	0.037	-0.039	0.127	0.384
	(0.352)	(0.078)	(0.267)	(0.106)	(0.111)	(0.148)	(0.357)	(0.088)	(0.280)	(0.176)	(0.173)	(0.238)
Manager	-2.452*	0.004	-0.212	-0.113	0.302	-0.209	-2.505*	0.022	-0.133	-0.119	0.309	-0.056
	(1.249)	(0.232)	(0.876)	(0.247)	(0.225)	(0.929)	(1.268)	(0.233)	(0.882)	(0.247)	(0.225)	(0.925)
Professional	-2.561**	-0.0003	0.201	0.446***	0.070	-0.165	-2.553**	0.004	0.246	0.427***	0.086	-0.092
	(1.063)	(0.155)	(0.538)	(0.130)	(0.174)	(0.249)	(1.077)	(0.155)	(0.542)	(0.133)	(0.176)	(0.250)
Clerical	-1.936**	0.045	-0.001	-0.006	0.325	-0.275	-1.980**	0.058	0.080	-0.016	0.319	-0.248
	(0.933)	(0.183)	(0.613)	(0.121)	(0.244)	(0.320)	(0.948)	(0.184)	(0.621)	(0.122)	(0.244)	(0.318)
Service	-3.403***	-0.156	-0.632	-0.017	-0.330**	-0.649***	-3.470***	-0.155	-0.579	-0.026	-0.339**	-0.670***
	(0.937)	(0.183)	(0.472)	(0.094)	(0.167)	(0.183)	(0.956)	(0.183)	(0.476)	(0.095)	(0.167)	(0.182)
Asset wealth index	0.024	0.106***	-0.002	0.059	0.242***	0.137*	0.061	0.105**	0.016	0.051	0.236***	0.156**
	(0.295)	(0.041)	(0.170)	(0.042)	(0.060)	(0.082)	(0.305)	(0.041)	(0.172)	(0.043)	(0.060)	(0.082)
Inverse Mill's ratio							0.610	0.364	-0.520	0.334	-0.336	-0.984*
							(0.987)	(0.431)	(0.604)	(0.435)	(0.479)	(0.511)
R-square	0.589	0.211	0.351	0.245	0.305	0.415	0.596	0.213	0.358	0.250	0.307	0.427
Observations	39	297	83	398	200	188	39	297	83	398	200	188

Continued 2 (Kenya, Laos and Macedonia)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD
Intercept	2.177	-0.986	-3.264**	-2.985*	-2.371	-0.674	12.127	-3.174	-4.825***	-4.797**	-6.627**	-1.871
	(5.272)	(2.266)	(1.524)	(1.797)	(1.893)	(1.257)	(10.256)	(5.936)	(1.706)	(2.315)	(2.903)	(1.571)
Age	-0.187	0.089	0.271**	0.189	0.213	0.105	-0.450	0.144	0.202*	0.277	0.452**	0.154
	(0.442)	(0.200)	(0.113)	(0.169)	(0.171)	(0.100)	(0.498)	(0.245)	(0.117)	(0.183)	(0.210)	(0.108)
Age^2	0.449	-0.060	-0.650**	-0.398	-0.595	-0.267	0.904	-0.131	-0.353	-0.537	-1.098**	-0.350
	(1.184)	(0.559)	(0.267)	(0.508)	(0.480)	(0.256)	(1.247)	(0.589)	(0.305)	(0.520)	(0.542)	(0.264)
Age^3	-0.025	-0.005	0.051**	0.028	0.050	0.023	-0.056	-0.004	0.020	0.031	0.081*	0.026
	(0.101)	(0.049)	(0.020)	(0.049)	(0.043)	(0.021)	(0.104)	(0.049)	(0.025)	(0.049)	(0.045)	(0.021)
Months in current job	-0.032	-0.002	0.003	0.008	0.010	0.004	-0.035*	-0.001	0.003	0.008	0.009	0.004
	(0.020)	(0.009)	(0.003)	(0.009)	(0.008)	(0.003)	(0.020)	(0.009)	(0.003)	(0.009)	(0.008)	(0.003)
Years of education	0.081*	-0.005	0.052***	0.033***	0.050***	0.029***	-0.107	0.051	0.117***	0.037***	0.050***	0.038***
	(0.044)	(0.025)	(0.009)	(0.011)	(0.017)	(0.0100	(0.172)	(0.143)	(0.034)	(0.012)	(0.017)	(0.012)
Has a labor contract	0.630	-0.005	-	0.439***	-0.014	-	0.772	-0.004	-	0.443***	-0.041	-
	(0.452)	(0.118)	-	(0.100)	(0.182)	-	(0.468)	(0.118)	-	(0.100)	(0.181)	-
Has an govt certificate	-0.094	-0.093	0.129**	-0.100	0.747***	0.102	-0.113	-0.104	0.117**	-0.090	0.776***	0.102
	(0.298)	(0.241)	(0.059)	(0.174)	(0.280)	(0.067)	(0.298)	(0.244)	(0.059)	(0.174)	(0.278)	(0.067)

Participated in a training	0.197	-0.098	0.018	0.252*	1.182**	0.296***	0.150	-0.102	0.006	0.247*	1.353***	0.291***
	(0.231)	(0.120)	(0.060)	(0.133)	(0.483)	(0.094)	(0.234)	(0.121)	(0.060)	(0.133)	(0.487)	(0.094)
Married	0.437*	-0.038	0.056	0.157*	0.325**	-0.101	0.591**	-0.084	0.068	-0.057	0.325**	-0.096
	(0.218)	(0.120)	(0.054)	(0.088)	(0.157)	(0.061)	(0.256)	(0.168)	(0.054)	(0.193)	(0.155)	(0.061)
Manager	-	0.149	0.632***	0.503*	-0.539	0.785***	-	0.173	0.622***	0.498*	-0.720	0.791***
	-	(0.417)	(0.149)	(0.300)	(0.585)	(0.180)	-	(0.423)	(0.149)	(0.3000	(0.587)	(0.180)
Professional	-0.275	-0.316	0.498***	0.346**	-0.112	0.466***	-0.292	-0.284	0.502***	0.357**	-0.287	0.457***
	(0.499)	(0.283)	(0.0950	(0.154)	(0.267)	(0.082)	(0.498)	(0.295)	(0.095)	(0.154)	(0.280)	(0.082)
Clerical	-0.432	-0.292	0.338***	0.439**	-0.314	0.225**	-0.492	-0.262	0.336***	0.452***	-0.375	0.226**
	(0.475)	(0.313)	(0.114)	(0.173)	(0.397)	(0.096)	(0.476)	(0.323)	(0.113)	(0.173)	(0.394)	(0.096)
Service	-0.249	0.177	0.200*	-0.125	0.008	0.011	-0.263	0.212	0.191*	-0.113	0.012	0.013
	(0.507)	(0.326)	(0.112)	(0.102)	(0.178)	(0.067)	(0.506)	(0.340)	(0.112)	(0.102)	(0.177)	(0.067)
Asset wealth index	0.048	0.113*	-0.039	0.129***	0.321***	0.061*	0.014	0.111	-0.036	0.114**	0.304***	0.060*
	(0.123)	(0.067)	(0.028)	(0.048)	(0.112)	(0.032)	(0.126)	(0.068)	(0.028)	(0.050)	(0.111)	(0.032)
Inverse Mill's ratio							-1.620	0.382	0.491**	0.426	0.748*	0.214
							(1.434)	(0.957)	(0.247)	(0.344)	(0.390)	(0.169)
R-square	0.400	0.283	0.410	0.358	0.379	0.398	0.418	0.284	0.418	0.361	0.395	0.401
Observations	55	120	288	431	149	365	55	120	288	431	149	365

Continued 3 (Sri Lanka, Ukraine and Vietnam)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	LK	UA	VN	LK	UA	VN	LK	UA	VN	LK	UA	VN
Intercept	-3.715	1.593	-3.044	0.474	-1.732	-2.036	-2.535	0.441	-7.618**	0.869	-1.346	-2.779
	(2.656)	(1.169)	(2.013)	(1.909)	(1.204)	(1.385)	(4.020)	(1.821)	(3.662)	(2.891)	(1.461)	(2.275)
Age	0.293	-0.173**	0.215	-0.073	0.143	0.147	0.306	-0.138	0.246	-0.095	0.128	0.201
	(0.217)	(0.085)	(0.168)	(0.160)	(0.090)	(0.119)	(0.220)	(0.096)	(0.169)	(0.203)	(0.096)	(0.178)
Age^2	-0.777	0.455**	-0.446	0.281	-0.341	-0.318	-0.883	0.405*	-0.219	0.331	-0.320	-0.450
	(0.555)	(0.202)	(0.447)	(0.418)	(0.224)	(0.324)	(0.619)	(0.212)	(0.472)	(0.500)	(0.229)	(0.456)
Age^3	0.065	-0.038**	0.027	-0.028	0.026	0.021	0.079	-0.036**	-0.015	-0.032	0.026	0.030
	(0.045)	(0.015)	(0.038)	(0.034)	(0.018)	(0.028)	(0.057)	(0.016)	(0.047)	(0.039)	(0.018)	(0.037)
Months in current job	0.017***	0.005**	0.003	-0.006	0.003	0.009*	0.017**	0.005**	0.004	-0.006	0.003	0.009*
	(0.006)	(0.002)	(0.005)	(0.006)	(0.003)	(0.006)	(0.007)	(0.002)	(0.005)	(0.007)	(0.003)	(0.006)
Years of education	0.071***	0.098***	0.067***	0.016	0.034*	0.054***	0.027	0.119***	0.176**	0.020	0.034*	0.052***
	(0.019)	(0.014)	(0.019)	(0.026)	(0.018)	(0.015)	(0.114)	(0.029)	(0.075)	(0.033)	(0.018)	(0.016)
Has a labor contract	0.006	-	0.068	0.312*	0.391*	0.060	-0.003	-	0.120	0.311*	0.398*	0.061
	(0.150)	-	(0.182)	(0.178)	(0.223)	(0.093)	(0.152)	-	(0.185)	(0.179)	(0.223)	(0.093)
Has an govt certificate	-0.092	0.171*	0.044	0.596**	0.006	-0.049	-0.084	0.167*	0.048	0.595**	0.016	-0.060
	(0.198)	(0.091)	(0.093)	(0.287)	(0.138)	(0.108)	(0.200)	(0.091)	(0.092)	(0.288)	(0.140)	(0.111)

Participated in a training	0.088	0.002	0.087	0.366	0.078	0.197	0.086	-0.012	0.089	0.363	0.080	0.198
	(0.120)	(0.111)	(0.120)	(0.260)	(0.198)	(0.167)	(0.120)	(0.111)	(0.119)	(0.261)	(0.198)	(0.167)
Married	-0.058	-0.018	-0.101	0.178	-0.046	0.035	-0.011	-0.019	-0.041	0.209	-0.035	0.007
	(0.147)	(0.054)	(0.109)	(0.154)	(0.062)	(0.092)	(0.190)	(0.055)	(0.116)	(0.231)	(0.067)	(0.113)
Manager	0.196	0.298***	0.440	0.229	0.239*	0.903**	0.189	0.295***	0.449	0.229	0.238*	0.876**
	(0.294)	(0.110)	(0.355)	(0.432)	(0.126)	(0.415)	(0.295)	(0.110)	(0.355)	(0.433)	(0.126)	(0.421)
Professional	0.231	0.024	0.079	0.210	0.024	0.394***	0.236	0.031	0.075	0.207	0.023	0.395***
	(0.214)	(0.077)	(0.160)	(0.257)	(0.085)	(0.141)	(0.215)	(0.077)	(0.159)	(0.258)	(0.085)	(0.141)
Clerical	0.087	-0.157	-0.077	-0.197	-0.008	0.509***	0.097	-0.149	-0.068	-0.201	-0.015	0.514***
	(0.265)	(0.110)	(0.167)	(0.271)	(0.126)	(0.173)	(0.268)	(0.110)	(0.167)	(0.273)	(0.127)	(0.174)
Service	-0.463	-0.097	-0.018	-0.572**	-0.251***	-0.023	-0.457	-0.097	-0.024	-0.570**	-0.248***	-0.023
	(0.318)	(0.090)	(0.177)	(0.260)	(0.078)	(0.114)	(0.319)	(0.089)	(0.176)	(0.261)	(0.078)	(0.114)
Asset wealth index	0.261***	-0.013	0.047	0.067	0.053*	0.044	0.264***	-0.009	0.043	0.068	0.054*	0.041
	(0.089)	(0.026)	(0.060)	(0.107)	(0.030)	(0.042)	(0.0900	(0.026)	(0.060)	(0.108)	(0.030)	(0.042)
Inverse Mill's ratio							-0.296	0.187	1.063	-0.083	-0.108	0.108
							(0.756)	(0.220)	(0.711)	(0.456)	(0.231)	(0.262)
R-square	0.438	0.312	0.182	0.171	0.198	0.289	0.439	0.318	0.188	0.172	0.198	0.290
Observations	152	346	343	179	254	382	152	346	343	179	254	382

Table A. 8 Public- and private- sector wage equation for men with OLS and selection model, by country (China, Armenia and Bolivia)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	CH	AM	BO	CH	AM	BO	CH	AM	BO	CH	AM	BO
Intercept	0.647	-1.085	-6.990	-4.118**	1.334	1.042	-2.937	2.441	-5.363	-4.744***	3.776	1.306
	(1.475)	(1.668)	(5.628)	(1.735)	(2.053)	(0.918)	(3.433)	(2.453)	(6.393)	(1.786)	(3.401)	(1.351)
Age	-0.124	0.097	0.391	0.265*	-0.042	-0.049	0.004	-0.017	0.347	0.275**	-0.170	-0.067
	(0.119)	(0.132)	(0.441)	(0.139)	(0.169)	(0.086)	(0.162)	(0.143)	(0.451)	(0.139)	(0.221)	(0.112)
Age^2	0.359	-0.215	-0.883	-0.644*	0.129	0.178	0.105	0.029	-0.810	-0.613*	0.426	0.218
	(0.303)	(0.321)	(1.084)	(0.352)	(0.436)	(0.247)	(0.374)	(0.342)	(1.098)	(0.352)	(0.546)	(0.290)
Age^3	-0.033	0.013	0.063	0.049*	-0.014	-0.017	-0.019	-0.004	0.059	0.042	-0.035	-0.019
	(0.025)	(0.025)	(0.085)	(0.029)	(0.036)	(0.022)	(0.028)	(0.026)	(0.086)	(0.029)	(0.043)	(0.024)
Months in current job	0.009**	0.003	0.015	0.006	0.002	0.014*	0.009**	0.004	0.013	0.007	0.003	0.013*
	(0.004)	(0.004)	(0.013)	(0.004)	(0.008)	(0.007)	(0.004)	(0.004)	(0.014)	(0.004)	(0.008)	(0.007)
Years of education	0.054***	0.023	0.122***	0.063***	0.025	0.014	0.127**	-0.039	0.094	0.055***	0.019	0.017
	(0.014)	(0.017)	(0.034)	(0.015)	(0.021)	(0.014)	(0.064)	(0.036)	(0.062)	(0.016)	(0.022)	(0.017)
Has a labor contract	0.273***	0.458**	-0.232	0.140*	-0.371**	0.027	0.275***	0.468**	-0.218	0.133*	-0.374**	0.028
	(0.099)	(0.227)	(0.367)	(0.080)	(0.147)	(0.100)	(0.099)	(0.225)	(0.370)	(0.080)	(0.148)	(0.101)
Has an govt certificate	-0.130	-0.003	-0.101	-0.007	0.164	-0.099	-0.124	0.014	-0.092	-0.009	0.176	-0.098
	(0.079)	(0.184)	(0.206)	(0.089)	(0.251)	(0.107)	(0.079)	(0.183)	(0.207)	(0.089)	(0.252)	(0.107)

Participated in a training	0.077	0.090	0.285	0.075	-0.096	-0.028	0.080	0.087	0.278	0.062	-0.092	-0.029
	(0.091)	(0.137)	(0.214)	(0.121)	(0.246)	(0.110)	(0.090)	(0.136)	(0.216)	(0.121)	(0.246)	(0.110)
Married	0.171	0.198	-0.030	0.142	0.218	0.099	0.187*	0.045	-0.048	0.102	0.218	0.087
	(0.112)	(0.126)	(0.227)	(0.122)	(0.158)	(0.105)	(0.113)	(0.148)	(0.231)	(0.125)	(0.159)	(0.113)
Manager	0.207	0.179	1.575***	0.450**	0.552**	1.084***	0.203	0.177	1.532***	0.457**	0.536**	1.087***
	(0.163)	(0.170)	(0.540)	(0.193)	(0.254)	(0.224)	(0.163)	(0.168)	(0.549)	(0.192)	(0.255)	(0.225)
Professional	0.256**	0.110	1.106**	0.219*	0.462**	0.625***	0.241**	0.099	1.099**	0.195	0.459**	0.627***
	(0.105)	(0.123)	(0.484)	(0.121)	(0.177)	(0.127)	(0.106)	(0.122)	(0.487)	(0.122)	(0.177)	(0.127)
Clerical	0.084	-0.228	1.208**	-0.122	0.070	0.110	0.069	-0.225	1.189**	-0.120	0.043	0.107
	(0.115)	(0.260)	(0.566)	(0.136)	(0.275)	(0.159)	(0.116)	(0.257)	(0.570)	(0.136)	(0.277)	(0.160)
Service	0.024	-0.396***	0.639	-0.179*	-0.230	-0.231*	0.023	-0.401***	0.649	-0.187**	-0.210	-0.232*
	(0.114)	(0.142)	(0.518)	(0.093)	(0.175)	(0.136)	(0.114)	(0.141)	(0.522)	(0.093)	(0.177)	(0.136)
Asset wealth index	0.068	0.086*	0.152	-0.032	0.064	0.117**	0.060	0.079*	0.166	-0.026	0.065	0.119**
	(0.046)	(0.046)	(0.112)	(0.046)	(0.058)	(0.053)	(0.046)	(0.046)	(0.116)	(0.046)	(0.058)	(0.054)
Inverse Mill's ratio							0.657	-0.727*	-0.301	0.431	-0.505	-0.069
							(0.568)	(0.374)	(0.549)	(0.300)	(0.561)	(0.260)
R-square	0.332	0.318	0.488	0.256	0.24	0.328	0.336	0.335	0.491	0.261	0.246	0.328
Observations	215	164	76	312	133	373	215	164	76	312	133	373

[a] Describes the estimates for the second stage of selection model, the estimates of first stage are reported in Table A.6.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued 1 (Colombia, Georgia and Ghana)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	CO	GE	GH	CO	GE	GH	CO	GE	GH	CO	GE	GH
Intercept	7.062	-1.515	-3.173	0.684	1.130	0.231	9.334	-0.217	-0.255	0.194	-4.261	-4.960
	(6.166)	(2.155)	(3.689)	(0.947)	(2.348)	(1.493)	(6.647)	(3.178)	(5.381)	(2.029)	(5.050)	(3.520)
Age	-0.584	0.203	0.244	-0.044	-0.071	-0.041	-0.532	0.160	0.137	-0.007	0.177	0.325
	(0.515)	(0.171)	(0.291)	(0.081)	(0.194)	(0.128)	(0.519)	(0.187)	(0.325)	(0.158)	(0.283)	(0.259)
Age^2	1.543	-0.437	-0.543	0.208	0.119	0.089	1.339	-0.345	-0.352	0.120	-0.511	-0.764
	(1.341)	(0.418)	(0.723)	(0.218)	(0.494)	(0.345)	(1.362)	(0.451)	(0.768)	(0.388)	(0.719)	(0.628)
Age^3	-0.127	0.030	0.039	-0.024	-0.006	-0.008	-0.107	0.023	0.029	-0.017	0.041	0.054
	(0.113)	(0.033)	(0.058)	(0.018)	(0.040)	(0.029)	(0.115)	(0.035)	(0.060)	(0.030)	(0.056)	(0.048)
Months in current job	-2.293	-0.001	-0.005	0.653	-0.004	0.026***	-3.373	-0.001	-0.006	0.638	-0.004	0.025***
	(3.791)	(0.007)	(0.010)	(0.679)	(0.008)	(0.008)	(3.974)	(0.007)	(0.010)	(0.682)	(0.008)	(0.008)
Years of education	0.177***	0.004	0.038	0.037***	0.057**	0.048***	0.089	-0.014	-0.003	0.035***	0.112**	0.021
	(0.061)	(0.027)	(0.026)	(0.011)	(0.028)	(0.014)	(0.112)	(0.042)	(0.061)	(0.012)	(0.053)	(0.022)
Has a labor contract	-0.240	-0.124	-0.143	0.051	0.348**	0.269**	-0.363	-0.125	-0.138	0.053	0.323**	0.261**
	(0.416)	(0.174)	(0.225)	(0.077)	(0.160)	(0.112)	(0.438)	(0.174)	(0.226)	(0.077)	(0.161)	(0.112)
Has an govt certificate	0.238	-0.140	-0.175	0.374	0.438**	0.303	0.300	-0.118	-0.173	0.357	0.418**	0.306
	(0.433)	(0.188)	(0.232)	(0.244)	(0.210)	(0.190)	(0.439)	(0.193)	(0.233)	(0.252)	(0.211)	(0.190)

Participated in a training	0.217	0.304*	0.283	0.075	-0.032	0.535***	0.276	0.302*	0.269	0.075	0.016	0.524***
	(0.253)	(0.175)	(0.174)	(0.074)	(0.213)	(0.170)	(0.261)	(0.176)	(0.175)	(0.074)	(0.217)	(0.170)
Married	0.089	-0.087	0.033	0.027	0.262	0.107	0.059	-0.111	-0.041	0.034	0.620*	0.137
	(0.283)	(0.147)	(0.206)	(0.085)	(0.161)	(0.124)	(0.285)	(0.154)	(0.228)	(0.089)	(0.338)	(0.125)
Manager	0.079	0.154	-0.066	0.230	0.483**	-1.304***	0.051	0.142	-0.029	0.233	0.471**	-1.412***
	(0.927)	(0.266)	(0.383)	(0.214)	(0.222)	(0.383)	(0.930)	(0.268)	(0.387)	(0.214)	(0.222)	(0.388)
Professional	-0.440	0.272	0.417	0.400***	0.348*	-0.230	-0.449	0.270	0.437	0.398***	0.340*	-0.252
	(0.709)	(0.174)	(0.265)	(0.099)	(0.181)	(0.154)	(0.711)	(0.174)	(0.267)	(0.100)	(0.181)	(0.155)
Clerical	-0.708	-0.068	-0.538	-0.065	0.114	-0.074	-0.736	-0.066	-0.529	-0.065	0.100	-0.088
	(0.616)	(0.355)	(0.332)	(0.102)	(0.360)	(0.313)	(0.618)	(0.356)	(0.333)	(0.102)	(0.359)	(0.312)
Service	0.100	-0.480***	-0.280	0.002	-0.693***	-0.511***	0.009	-0.485***	-0.258	0.001	-0.678***	-0.500***
	(0.594)	(0.176)	(0.294)	(0.091)	(0.189)	(0.137)	(0.604)	(0.177)	(0.296)	(0.091)	(0.189)	(0.137)
Asset wealth index	-0.009	0.141**	0.230**	0.071**	0.086	0.049	0.030	0.136**	0.252**	0.070*	0.093	0.043
	(0.191)	(0.062)	(0.100)	(0.035)	(0.069)	(0.071)	(0.196)	(0.063)	(0.104)	(0.036)	(0.069)	(0.071)
Inverse Mill's ratio							-0.581	-0.263	-0.490	0.076	1.103	0.789
							(0.625)	(0.471)	(0.657)	(0.279)	(0.915)	(0.485)
R-square	0.562	0.297	0.31	0.221	0.428	0.249	0.577	0.300	0.312	0.221	0.434	0.255
Observations	41	117	156	426	147	326	41	117	156	426	147	326

Continued 2 (Kenya, Laos and Macedonia)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD	KE	LA	MKD
Intercept	1.539	2.617	-0.475	-1.816*	1.280	-1.030	0.861	-0.983	-0.455	-2.692*	1.083	0.225
	(3.584)	(1.978)	(1.257)	(0.944)	(1.471)	(0.998)	(6.626)	(3.593)	(1.632)	(1.420)	(2.216)	(1.747)
Age	-0.208	-0.198	0.080	0.143*	-0.029	0.147*	-0.173	-0.087	0.079	0.204*	-0.018	0.077
	(0.290)	(0.165)	(0.095)	(0.081)	(0.138)	(0.081)	(0.412)	(0.189)	(0.097)	(0.109)	(0.168)	(0.113)
Age^2	0.686	0.612	-0.166	-0.314	0.124	-0.387*	0.601	0.403	-0.166	-0.457*	0.104	-0.239
	(0.767)	(0.428)	(0.230)	(0.216)	(0.394)	(0.207)	(1.038)	(0.462)	(0.230)	(0.277)	(0.431)	(0.267)
Age^3	-0.066	-0.059	0.011	0.022	-0.014	0.033*	-0.059	-0.046	0.011	0.033	-0.014	0.023
	(0.065)	(0.036)	(0.018)	(0.018)	(0.036)	(0.017)	(0.084)	(0.037)	(0.018)	(0.022)	(0.037)	(0.020)
Months in current job	-0.012	0.007	0.007***	0.010**	0.0004	0.005*	-0.012	0.006	0.007***	0.010**	0.001	0.005*
	(0.012)	(0.006)	(0.003)	(0.005)	(0.009)	(0.003)	(0.012)	(0.006)	(0.003)	(0.005)	(0.009)	(0.003)
Years of education	0.071**	0.017	0.059***	0.030***	-0.003	0.039***	0.079	0.086	0.059***	0.029***	-0.007	0.037***
	(0.029)	(0.019)	(0.009)	(0.008)	(0.019)	(0.010)	(0.067)	(0.061)	(0.022)	(0.008)	(0.033)	(0.011)
Has a labor contract	0.535	-0.097	-	0.153**	-0.061	-	0.532	-0.105	-	0.152**	-0.062	-
	(0.332)	(0.119)	-	(0.064)	(0.181)	-	(0.335)	(0.119)	-	(0.064)	(0.182)	-
Has an govt certificate	0.101	0.097	-0.013	0.033	0.443	0.053	0.103	0.081	-0.013	0.032	0.440	0.048
	(0.217)	(0.160)	(0.072)	(0.091)	(0.349)	(0.077)	(0.219)	(0.161)	(0.072)	(0.091)	(0.352)	(0.078)

Participated in a training	0.078	-0.073	-0.037	0.208**	-0.131	0.146	0.078	-0.077	-0.037	0.204**	-0.127	0.145
	(0.200)	(0.132)	(0.083)	(0.086)	(0.387)	(0.098)	(0.201)	(0.132)	(0.083)	(0.086)	(0.390)	(0.098)
Married	-0.344**	0.029	0.053	-0.048	-0.122	0.028	-0.344*	0.409	0.052	-0.016	-0.130	0.015
	(0.172)	(0.196)	(0.060)	(0.068)	(0.179)	(0.068)	(0.173)	(0.373)	(0.081)	(0.078)	(0.190)	(0.069)
Manager	0.777	-0.318	0.190	0.578***	-	0.086	0.781	-0.299	0.190	0.567***	-	0.089
	(0.573)	(0.237)	(0.151)	(0.200)	-	(0.233)	(0.577)	(0.237)	(0.151)	(0.201)	-	(0.233)
Professional	0.373	-0.024	0.174**	0.573***	0.237	0.266***	0.372	-0.010	0.174**	0.569***	0.236	0.275***
	(0.264)	(0.206)	(0.073)	(0.090)	(0.267)	(0.084)	(0.265)	(0.206)	(0.073)	(0.090)	(0.268)	(0.084)
Clerical	0.291	-0.097	0.147	-0.014	0.207	-0.015	0.292	-0.057	0.147	-0.011	0.206	-0.0001
	(0.302)	(0.270)	(0.103)	(0.127)	(0.640)	(0.114)	(0.304)	(0.271)	(0.103)	(0.127)	(0.642)	(0.115)
Service	0.103	-0.293	-0.028	-0.399***	-0.256	-0.143**	0.102	-0.262	-0.028	-0.401***	-0.253	-0.138*
	(0.372)	(0.214)	(0.075)	(0.065)	(0.221)	(0.071)	(0.374)	(0.215)	(0.076)	(0.065)	(0.224)	(0.072)
Asset wealth index	0.194**	0.017	0.039	0.242***	0.142	0.104***	0.194**	0.001	0.039	0.236***	0.141	0.103***
	(0.090)	(0.071)	(0.029)	(0.035)	(0.098)	(0.032)	(0.091)	(0.072)	(0.030)	(0.036)	(0.099)	(0.032)
Inverse Mill's ratio							0.068	0.695	-0.005	0.157	0.051	-0.218
							(0.556)	(0.579)	(0.235)	(0.190)	(0.427)	(0.249)
R-square	0.462	0.113	0.363	0.442	0.072	0.256	0.462	0.121	0.363	0.443	0.072	0.258
Observations	99	173	290	731	159	402	99	173	290	731	159	402

Continued 3 (Sri Lanka, Ukraine and Vietnam)

Variable	Panel A: OLS						Panel B: Selectivity adjustment[a]					
	Public sector			Private Sector			Public Sector			Private Sector		
	LK	UA	VN	LK	UA	VN	LK	UA	VN	LK	UA	VN
Intercept	-0.358	-0.426	4.306**	-0.692	0.463	-4.305***	8.152	-0.048	0.102	-0.591	0.369	-2.548
	(2.749)	(2.229)	(1.880)	(1.200)	(1.536)	(1.153)	(5.414)	(2.506)	(3.901)	(1.834)	(2.196)	(2.149)
Age	-0.010	0.092	-0.343**	0.087	-0.001	0.409***	-0.307	0.081	-0.259	0.079	0.004	0.279*
	(0.213)	(0.173)	(0.150)	(0.102)	(0.119)	(0.098)	(0.267)	(0.176)	(0.165)	(0.148)	(0.140)	(0.166)
Age^2	0.134	-0.195	0.956**	-0.183	0.040	-1.083***	0.622	-0.180	0.911**	-0.164	0.030	-0.778*
	(0.527)	(0.419)	(0.375)	(0.269)	(0.307)	(0.262)	(0.588)	(0.423)	(0.377)	(0.372)	(0.347)	(0.410)
Age^3	-0.019	0.011	-0.085***	0.012	-0.008	0.092***	-0.040	0.011	-0.093***	0.011	-0.007	0.070**
	(0.042)	(0.033)	(0.030)	(0.023)	(0.025)	(0.022)	(0.043)	(0.033)	(0.031)	(0.029)	(0.027)	(0.032)
Months in current job	0.007	0.003	0.017***	-0.004	0.006	0.002	0.007	0.003	0.017***	-0.004	0.006	0.002
	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)
Years of education	0.100***	0.051*	0.068***	0.040***	-0.007	0.045***	-0.045	0.047*	0.152**	0.042	-0.006	0.056***
	(0.026)	(0.026)	(0.017)	(0.015)	(0.023)	(0.012)	(0.084)	(0.029)	(0.071)	(0.029)	(0.029)	(0.016)
Has a labor contract	-0.101	-	-0.101	0.053	0.709	-0.147*	-0.115	-	-0.076	0.052	0.711	-0.150*
	(0.152)	-	(0.163)	(0.104)	(0.530)	(0.087)	(0.151)	-	(0.164)	(0.105)	(0.532)	(0.087)
Has an govt certificate	-0.053	-0.166	0.021	0.035	0.027	0.102	-0.087	-0.167	0.026	0.035	0.027	0.102
	(0.169)	(0.157)	(0.083)	(0.156)	(0.130)	(0.093)	(0.168)	(0.158)	(0.083)	(0.157)	(0.130)	(0.093)

Participated in a training	-0.066	0.350	0.102	-0.219	0.023	-0.147	-0.099	0.349	0.104	-0.217	0.024	-0.157
	(0.172)	(0.344)	(0.129)	(0.225)	(0.379)	(0.174)	(0.172)	(0.345)	(0.129)	(0.227)	(0.381)	(0.174)
Married	-0.179	0.162	-0.222	0.141	0.072	0.018	-0.304	0.162	0.111	0.139	0.075	0.058
	(0.216)	(0.127)	(0.135)	(0.121)	(0.090)	(0.094)	(0.225)	(0.127)	(0.302)	(0.125)	(0.107)	(0.102)
Manager	0.363	-0.140	0.290	0.234	0.413***	0.118	0.314	-0.154	0.271	0.236	0.412***	0.137
	(0.228)	(0.420)	(0.193)	(0.213)	(0.152)	(0.269)	(0.228)	(0.423)	(0.193)	(0.216)	(0.154)	(0.269)
Professional	-0.059	-0.245*	-0.008	0.470***	0.190*	0.374***	-0.092	-0.241	-0.036	0.472***	0.190*	0.385***
	(0.199)	(0.145)	(0.137)	(0.177)	(0.113)	(0.126)	(0.198)	(0.146)	(0.139)	(0.179)	(0.113)	(0.126)
Clerical	-0.038	-	-0.159	-0.304*	-0.228	0.109	-0.082	-	-0.166	-0.304*	-0.228	0.097
	(0.195)	-	(0.185)	(0.175)	(0.228)	(0.163)	(0.195)	-	(0.185)	(0.176)	(0.228)	(0.163)
Service	-0.118	-0.501***	-0.424***	-0.279**	-0.301*	-0.323***	-0.148	-0.492***	-0.437***	-0.278**	-0.301*	-0.326***
	(0.221)	(0.177)	(0.138)	(0.139)	(0.159)	(0.103)	(0.220)	(0.179)	(0.138)	(0.140)	(0.160)	(0.103)
Asset wealth index	0.143	-0.085	0.026	0.189***	0.031	0.059	0.177*	-0.085	0.032	0.190***	0.030	0.066*
	(0.099)	(0.055)	(0.056)	(0.065)	(0.040)	(0.038)	(0.100)	(0.055)	(0.056)	(0.065)	(0.040)	(0.039)
Inverse Mill's ratio							-1.424*	-0.106	0.852	-0.026	0.020	-0.254
							(0.783)	(0.315)	(0.693)	(0.354)	(0.341)	(0.262)
R-square	0.266	0.217	0.354	0.147	0.158	0.322	0.281	0.217	0.358	0.147	0.158	0.324
Observations	177	120	246	385	196	338	177	120	246	385	196	338

Table A. 9 Decomposition[a] for gender wage gap in public- and private- sector, by country

	OLS						Selection bias adjusted					
	CH		AM		BO		CH		AM		BO	
	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N
Gender wage gap in public	0.067	0.067	0.272***	0.272***	-0.109	-0.109	0.067	0.067	0.272***	0.272***	-0.109	-0.109
	(0.055)	(0.055)	(0.055)	(0.055)	(0.129)	(0.129)	(0.055)	(0.055)	(0.055)	(0.055)	(0.129)	(0.129)
Endowment effects	-0.095***	-0.059*	-0.026	0.015	0.049	-0.016	-0.161***	-0.148**	-0.036	0.025	0.027	0.029
	(0.034)	(0.032)	(0.028)	(0.024)	(0.110)	(0.078)	(0.054)	(0.057)	(0.022)	(0.020)	(0.096)	(0.117)
Age	-0.016***	-0.007	-0.002	-0.001	-0.005	-0.023	-0.037***	-0.042***	0.005	-0.003	-0.013	-0.001
	(0.006)	(0.006)	(0.013)	(0.006)	(0.024)	(0.017)	(0.013)	(0.015)	(0.015)	(0.007)	(0.023)	(0.024)
Experience	0.008	0.011	-0.014***	-0.008***	0.018	0.022	0.008	0.011	-0.019***	-0.008***	0.015	0.023
	(0.011)	(0.014)	(0.003)	(0.002)	(0.030)	(0.038)	(0.011)	(0.014)	(0.005)	(0.002)	(0.025)	(0.039)
Education	-0.035**	-0.041**	-0.004	-0.011	0.040	0.026	-0.083**	-0.099**	0.008	-0.007	0.030	0.049
	(0.016)	(0.019)	(0.006)	(0.015)	(0.061)	(0.039)	(0.038)	(0.045)	(0.011)	(0.010)	(0.047)	(0.076)
Contract	-0.015	-0.010	-0.008	-0.007	-0.012	0.004	-0.016	-0.010	-0.008	-0.007	-0.012	0.003
	(0.010)	(0.006)	(0.007)	(0.006)	(0.012)	(0.004)	(0.010)	(0.006)	(0.007)	(0.006)	(0.011)	(0.003)
Certificate	-0.003	0.0002	0.0001	0.001	0.015*	-0.023*	-0.003	-0.0001	-0.0003	0.001	0.014*	-0.020*
	(0.006)	(0.0004)	(0.0001)	(0.001)	(0.008)	(0.012)	(0.006)	(0.0001)	(0.0003)	(0.001)	(0.007)	(0.010)
Occupation	-0.020**	-0.001	-0.310**	0.022**	-0.013	-0.033	-0.018*	0.0002	-0.029**	0.023**	-0.014	-0.028
	(0.010)	(0.0070	(0.015)	(0.009)	(0.048)	(0.041)	(0.010)	(0.007)	(0.015)	(0.009)	(0.047)	(0.042)

Marriage	-0.006	-0.004	0.032***	0.013***	-0.005**	0.002**	-0.006	-0.003	0.007***	0.016***	-0.008**	-0.006**
	(0.007)	(0.004)	(0.009)	(0.004)	(0.002)	(0.001)	(0.007)	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)
Asset	-0.003	-0.002	0.009	0.010	0.009	0.008	-0.003	-0.002	0.008	0.010	0.010	0.008
	(0.006)	(0.004)	(0.007)	(0.008)	(0.021)	(0.019)	(0.005)	(0.004)	(0.007)	(0.008)	(0.023)	(0.018)
Training	-0.005	-0.004	-0.008***	-0.005***	0.003	0.0001	-0.005	-0.004	-0.008***	-0.005***	0.003	0.0003
	(0.003)	(0.003)	(0.003)	(0.002)	(0.021)	(0.001)	(0.003)	(0.003)	(0.003)	(0.002)	(0.021)	(0.002)
Discrimination effect[b]	0.162***	0.126***	0.299***	0.258***	-0.158***	-0.093***	0.530***	0.517***	1.170***	1.109***	2.075***	2.073***
	(0.012)	[0.000]	(0.011)	[0.000]	(0.054)	[0.008]	(0.017)	[0.000]	(0.015)	[0.000]	(0.060)	[0.000]
Selection bias effect	-	-	-	-	-	-	-0.302	-0.302	-0.862	-0.862	-2.211	-2.211
Gender wage gap in private	-0.024	-0.024	0.269**	0.269**	0.358***	0.358***	-0.024	-0.024	0.269**	0.269**	0.358***	0.358***
	(0.054)	(0.054)	(0.111)	(0.111)	(0.066)	(0.066)	(0.054)	(0.054)	(0.111)	(0.111)	(0.066)	(0.066)
Endowment effects	-0.107***	-0.097***	0.010	0.013	0.130***	0.141***	-0.109***	-0.105***	0.016	0.035	0.133***	0.151***
	(0.030)	(0.025)	(0.043)	(0.032)	(0.039)	(0.036)	(0.029)	(0.026)	(0.040)	(0.031)	(0.039)	(0.036)
Age	-0.027***	-0.025***	-0.009	-0.007	0.005	0.005**	-0.041***	-0.034***	-0.001	0.003	0.008	0.017***
	(0.008)	(0.005)	(0.013)	(0.005)	(0.008)	(0.003)	(0.012)	(0.007)	(0.012)	(0.003)	(0.008)	(0.007)
Experience	0.007	0.005	-0.001	0.002	0.024***	0.029***	0.008	0.005	-0.001	0.002	0.024***	0.027***
	(0.005)	(0.003)	(0.002)	(0.010)	(0.006)	(0.007)	(0.005)	(0.004)	(0.003)	(0.009)	(0.006)	(0.007)
Education	-0.085***	-0.066***	0.001	0.003	0.004	0.003	-0.074***	-0.066***	0.001	0.003	0.005	0.004
	(0.016)	(0.013)	(0.010)	(0.022)	(0.004)	(0.003)	(0.014)	(0.013)	(0.007)	(0.020)	(0.005)	(0.005)
Contract	-0.024***	-0.025***	-0.028	-0.009	0.001	0.004	-0.022***	-0.025***	-0.028	-0.009	0.001	0.003

	(0.006)	(0.006)	(0.020)	(0.007)	(0.001)	(0.002)	(0.005)	(0.006)	(0.020)	(0.006)	(0.001)	(0.002)
Certificate	-0.0000	0.0002	-0.020***	-0.015***	-0.004	-0.001	-0.0000	0.0002	-0.022***	-0.015***	-0.004	-0.001
	(0.0002)	(0.001)	(0.006)	(0.005)	(0.003)	(0.001)	(0.0003)	(0.001)	(0.007)	(0.005)	(0.003)	(0.001)
Occupation	0.020	0.018*	0.025	0.010	0.079***	0.070***	0.021	0.019***	0.026	0.003	0.079***	0.067***
	(0.014)	(0.010)	(0.032)	(0.013)	(0.027)	(0.020)	(0.013)	(0.010)	(0.031)	(0.013)	(0.027)	(0.020)
Marriage	-0.0002	0.0000	0.041***	0.019***	0.009***	0.016***	-0.0001	0.0000	0.040***	0.038***	0.008***	0.017***
	(0.005)	(0.0003)	(0.013)	(0.006)	(0.003)	(0.006)	(0.003)	(0.001)	(0.013)	(0.012)	(0.003)	(0.006)
Asset	0.002	-0.002	-0.004	0.0004	0.011	0.015	0.002	-0.002	-0.005	0.001	0.012	0.017
	(0.003)	(0.002)	(0.008)	(0.001)	(0.009)	(0.012)	(0.002)	(0.0020	(0.008)	(0.002)	(0.010)	(0.013)
Training	-0.002	-0.002	0.005	0.009	-0.0001	0.0002	-0.001	-0.002	0.005	0.009	-0.0001	0.0002
	(0.002)	(0.002)	(0.003)	(0.006)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.001)	(0.002)
Discrimination effect[b]	0.084***	0.074***	0.259***	0.256***	0.228***	0.217***	-0.517***	-0.521***	3.718***	3.699***	0.862***	0.843***
	(0.014)	[0.000]	(0.037)	[0.000]	(0.014)	[0.000]	(0.015)	[0.000]	(0.051)	[0.000]	(0.015)	[0.000]
Selection bias effect	-	-	-	-	-	-	0.602	0.602	-3.465	-3.465	-0.637	-0.636
Δ gap (public-private)	0.091	0.091	0.003	0.003	-0.467	-0.467	0.091	0.091	0.003	0.003	-0.467	-0.467
Δ endowment	0.012	0.038	-0.036	0.002	-0.081	-0.157	-0.052	-0.043	-0.052	-0.01	-0.106	-0.122
Δ discrimination	0.078	0.052	0.04	0.002	-0.386	-0.310	1.047	1.038	-2.548	-2.590	1.213	1.230

[a] Blinder-Oaxaca and Neumark decompositions at the mean. A positive entry indicates an advantage in favor of males.
[b] Robust S.E. in parenthesis and p-values in square brackets.
*, ** and *** indicate the significant differences at the level of 0.1, 0.05 and 0.01 respectively.

Continued 1

	OLS						Selection bias adjusted					
	CO		GE		GH		CO		GE		GH	
	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N
Gender wage gap in public	0.180	0.180	0.264***	0.264***	0.118	0.118	0.180	0.180	0.264***	0.264***	0.118	0.118
	(0.198)	(0.198)	(0.076)	(0.076)	(0.145)	(0.145)	(0.198)	(0.198)	(0.076)	(0.076)	(0.145)	(0.145)
Endowment effects	0.054	-0.006	-0.194***	-0.044	0.057	0.060	0.064	0.130	-0.187***	-0.009	0.020	0.011
	(0.144)	(0.119)	(0.039)	(0.033)	(0.081)	(0.080)	(0.095)	(0.083)	(0.036)	(0.027)	(0.064)	(0.053)
Age	0.035	-0.004	-0.014	0.010	0.039**	0.052**	0.026	-0.014	-0.010	0.029**	0.011**	0.018**
	(0.046)	(0.031)	(0.011)	(0.006)	(0.017)	(0.023)	(0.034)	(0.059)	(0.009)	(0.012)	(0.005)	(0.008)
Experience	0.004	0.0003	0.003***	0.011***	0.010	0.0002	0.006	0.001	0.004***	0.011***	0.012	0.002
	(0.018)	(0.001)	(0.001)	(0.002)	(0.008)	(0.0002)	(0.026)	(0.003)	(0.001)	(0.0023)	(0.010)	(0.002)
Education	-0.036	-0.033	-0.002	-0.025	0.003	0.004	-0.018	-0.006	0.005	-0.010	-0.0002	-0.001
	(0.138)	(0.126)	(0.001)	(0.020)	(0.023)	(0.029)	(0.070)	(0.022)	(0.004)	(0.008)	(0.002)	(0.006)
Contract	0.005	0.001	0.010***	0.001**	-0.001	-0.001	0.008	0.003	0.010***	0.001***	-0.001	-0.001
	(0.015)	(0.004)	(0.004)	(0.000)	(0.007)	(0.005)	(0.023)	(0.009)	(0.004)	(0.000)	(0.006)	(0.006)
Certificate	0.017	0.018	0.009	0.005	-0.003	-0.001	0.022	0.019	0.008	0.005	-0.003	-0.0003
	(0.013)	(0.014)	(0.006)	(0.003)	(0.008)	(0.001)	(0.016)	(0.014)	(0.005)	(0.003)	(0.008)	(0.001)
Occupation	0.008	0.007	-0.144***	-0.016	-0.003	-0.004	0.006	0.006	-0.144***	-0.018	-0.004	-0.005
	(0.067)	(0.070)	(0.027)	(0.012)	(0.045)	(0.040)	(0.063)	(0.069)	(0.027)	(0.012)	(0.045)	(0.041)

Marriage	0.007	-0.003	-0.009*	0.009*	0.0005	-0.0004	0.005	-0.003	-0.011*	0.012*	-0.001	-0.002
	(0.009)	(0.004)	(0.005)	(0.005)	(0.002)	(0.002)	(0.006)	(0.004)	(0.006)	(0.006)	(0.003)	(0.008)
Asset	0.001	-0.007	-0.006	-0.004	-0.036	-0.026	-0.003	-0.009	-0.005	-0.005	-0.039	-0.031
	(0.001)	(0.010)	(0.015)	(0.012)	(0.027)	(0.019)	(0.005)	(0.014)	(0.014)	(0.012)	(0.030)	(0.023)
Training	0.011	0.014	-0.044***	-0.034***	0.048***	0.035***	0.014	0.016	-0.044***	-0.034***	0.046***	0.031***
	(0.025)	(0.031)	(0.015)	(0.012)	(0.017)	(0.012)	(0.031)	(0.036)	(0.015)	(0.012)	(0.016)	(0.011)
Discrimination effect	0.126	0.186**	0.458***	0.308***	0.062	0.059***	2.129***	2.181***	1.346***	1.168***	-0.057	-0.048***
	(0.142)	[0.025]	(0.015)	[0.000]	(0.044)	[0.009]	(0.154)	[0.000]	(0.020)	[0.000]	(0.045)	[0.000]
Selection bias effect	-	-	-	-	-	-	-2.013	-2.131	-0.895	-0.895	0.155	0.155
Gender wage gap in private	0.276***	0.276***	0.354***	0.354***	0.340***	0.340***	0.276***	0.276***	0.354***	0.354***	0.340***	0.340***
	(0.051)	(0.051)	(0.095)	(0.095)	(0.096)	(0.096)	(0.051)	(0.051)	(0.095)	(0.095)	(0.096)	(0.096)
Endowment effects	0.019	0.067***	0.097	0.082	0.199***	0.249***	0.022	0.063***	0.125	0.108**	0.217***	0.246***
	(0.023)	(0.025)	(0.074)	(0.055)	(0.049)	(0.053)	(0.024)	(0.024)	(0.096)	(0.053)	(0.049)	(0.053)
Age	-0.010	-0.001	0.019*	0.012	-0.024**	-0.002	-0.008	-0.003	0.012	0.032	0.001	-0.005**
	(0.008)	(0.004)	(0.011)	(0.007)	(0.009)	(0.002)	(0.009)	(0.003)	(0.031)	(0.020)	(0.019)	(0.002)
Experience	0.005**	0.003**	-0.006	0.0001	0.056***	0.049***	0.004**	0.003**	-0.007	-0.0005	0.054***	0.049***
	(0.002)	(0.001)	(0.004)	(0.000)	(0.017)	(0.015)	(0.002)	(0.001)	(0.004)	(0.0003)	(0.016)	(0.015)
Education	0.005	0.005	-0.014	-0.012	0.008	0.009	0.004	0.005	-0.027	-0.004	0.004	0.009
	(0.009)	(0.011)	(0.017)	(0.015)	(0.023)	(0.026)	(0.009)	(0.011)	(0.034)	(0.005)	(0.010)	(0.026)
Contract	0.009***	0.029***	0.041**	0.030**	0.023*	0.024*	0.009***	0.028***	0.038**	0.028**	0.023*	0.024*

	(0.002)	(0.006)	(0.018)	(0.013)	(0.012)	(0.012)	(0.002)	(0.005)	(0.016)	(0.012)	(0.012)	(0.012)
Certificate	-0.001	-0.001	-0.041**	-0.007**	-0.006	-0.001	-0.001	-0.001	-0.039**	-0.011**	-0.006	-0.001
	(0.004)	(0.002)	(0.017)	(0.003)	(0.008)	(0.002)	(0.004)	(0.002)	(0.016)	(0.005)	(0.008)	(0.002)
Occupation	0.0000	0.010	0.072	0.065**	0.117***	0.155***	0.0001	0.009	0.071	0.058*	0.114***	0.154***
	(0.010)	(0.011)	(0.047)	(0.031)	(0.022)	(0.025)	(0.010)	(0.011)	(0.046)	(0.033)	(0.023)	(0.025)
Marriage	0.002***	0.008***	0.039***	0.019***	0.009*	0.004*	0.003***	0.008***	0.091***	0.029***	0.011*	0.004*
	(0.001)	(0.002)	(0.014)	(0.007)	(0.005)	(0.002)	(0.001)	(0.003)	(0.033)	(0.010)	(0.006)	(0.002)
Asset	0.004	0.004	-0.013	-0.025	-0.003	-0.005	0.004	0.004	-0.014	-0.023	-0.003	-0.005
	(0.005)	(0.004)	(0.009)	(0.018)	(0.004)	(0.008)	(0.005)	(0.005)	(0.010)	(0.017)	(0.004)	(0.008)
Training	0.006***	0.009***	0.001	-0.001	0.018	0.017	0.006***	0.009***	-0.0004	-0.001	0.018	0.017
	(0.002)	(0.003)	(0.001)	(0.001)	(0.016)	(0.015)	(0.002)	(0.003)	(0.001)	(0.001)	(0.016)	(0.015)
Discrimination effect	0.257***	0.209***	0.257***	0.273***	0.141***	0.091***	0.523**	0.482***	-1.851***	-1.871***	-1.702***	-1.731***
	(0.008)	[0.000]	(0.030)	[0.000]	(0.023)	[0.000]	(0.008)	[0.000]	(0.047)	[0.000]	(0.038)	[0.000]
Selection bias effect	-	-	-	-	-	-	-0.269	-0.269	2.080	2.117	1.825	1.825
Δ gap (public-private)	-0.096	-0.096	-0.090	-0.090	-0.222	-0.222	-0.096	-0.096	-0.090	-0.090	-0.222	-0.222
Δ endowment	0.035	-0.073	-0.291	-0.126	-0.142	-0.189	0.042	0.067	-0.312	-0.117	-0.197	-0.235
Δ discrimination	-0.131	-0.023	0.201	0.035	-0.079	-0.032	1.606	1.699	3.197	3.039	1.645	1.683

Continued 2

	OLS						Selection bias adjusted					
	KE		LA		MKD		KE		LA		MKD	
	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N
Gender wage gap in public	-0.186	-0.186	0.125	0.125	0.026	0.026	-0.186	-0.186	0.125	0.125	0.026	0.026
	(0.139)	(0.139)	(0.082)	(0.082)	(0.041)	(0.041)	(0.139)	(0.139)	(0.082)	(0.082)	(0.041)	(0.041)
Endowment effects	0.032	0.025	-0.037	0.070***	-0.129***	-0.119***	0.036	0.125	0.126**	0.131***	-0.128***	-0.127***
	(0.102)	(0.083)	(0.027)	(0.026)	(0.023)	(0.024)	(0.106)	(0.226)	(0.057)	(0.043)	(0.023)	(0.025)
Age	-0.021	-0.020	-0.006	0.056**	-0.002	-0.0002	-0.021	-0.049	0.054**	0.091***	-0.002	-0.002
	(0.028)	(0.021)	(0.015)	(0.023)	(0.003)	(0.004)	(0.029)	(0.097)	(0.023)	(0.031)	(0.003)	(0.004)
Experience	0.022	0.013	0.008	0.001	-0.011	-0.009	0.023	0.012	0.006	0.001	-0.011	-0.009
	(0.016)	(0.009)	(0.010)	(0.001)	(0.008)	(0.006)	(0.016)	(0.009)	(0.008)	(0.001)	(0.008)	(0.006)
Education	0.040	0.031	0.001	0.001	-0.060***	-0.059***	0.044	0.161	0.004	0.003	-0.060***	-0.066***
	(0.042)	(0.032)	(0.007)	(0.001)	(0.017)	(0.017)	(0.046)	(0.169)	(0.038)	(0.027)	(0.017)	(0.020)
Contract	0.016	0.017	0.004	0.003	0.000	0.000	0.016	0.017	0.004	0.003	0.000	0.000
	(0.023)	(0.025)	(0.006)	(0.005)	(0.000)	(0.000)	(0.023)	(0.025)	(0.006)	(0.004)	(0.000)	(0.000)
Certificate	0.002	0.0002	0.010***	0.005***	0.001*	-0.003*	0.002	0.001	0.009***	0.005***	0.001*	-0.003*
	(0.006)	(0.001)	(0.004)	(0.002)	(0.0004)	(0.002)	(0.006)	(0.002)	(0.003)	(0.002)	(0.0004)	(0.002)
Occupation	0.015	0.015	-0.066***	-0.005	-0.049***	-0.053***	0.014	0.015	-0.065***	-0.002	-0.049***	-0.053***
	(0.024)	(0.015)	(0.014)	(0.010)	(0.007)	(0.008)	(0.023)	(0.014)	(0.013)	(0.010)	(0.007)	(0.008)

Marriage	-0.017	-0.006	0.008***	0.001	0.001	0.001	-0.017	-0.011	0.112***	0.023***	0.001	0.001
	(0.029)	(0.010)	(0.001)	(0.0002)	(0.002)	(0.002)	(0.029)	(0.019)	(0.020)	(0.004)	(0.002)	(0.002)
Asset	-0.014	-0.013	0.002	0.007	-0.012***	0.001***	-0.014	-0.012	0.0001	0.006	-0.012***	0.001***
	(0.037)	(0.032)	(0.002)	(0.007)	(0.003)	(0.0002)	(0.037)	(0.031)	(0.0001)	(0.006)	(0.003)	(0.0002)
Training	-0.011*	-0.013*	0.003	0.002	0.003***	0.003***	-0.010	-0.008*	0.003	0.002	0.003***	0.003***
	(0.006)	(0.008)	(0.004)	(0.002)	(0.001)	(0.001)	(0.006)	(0.005)	(0.004)	(0.003)	(0.001)	(0.001)
Discrimination effect	-0.218***	-0.211***	0.162***	0.055***	0.155***	0.145***	-3.176***	-3.265***	-0.088**	-0.094***	0.734***	0.733***
	(0.067)	[0.000]	(0.033)	[0.005]	(0.008)	[0.000]	(0.159)	[0.000]	(0.036)	[0.000]	(0.017)	[0.000]
Selection bias effect	-	-	-	-	-	-	2.954	2.954	0.087	0.088	-0.580	-0.580
Gender wage gap in private	0.155**	0.155**	0.294***	0.294***	0.093**	0.093**	0.155**	0.155**	0.294***	0.294***	0.093**	0.093**
	(0.061)	(0.061)	(0.098)	(0.098)	(0.044)	(0.044)	(0.061)	(0.061)	(0.098)	(0.098)	(0.044)	(0.044)
Endowment effects	0.023	0.048	-0.020	-0.029	-0.043*	-0.039	0.030	0.052	-0.023	-0.036	-0.033	-0.030
	(0.039)	(0.038)	(0.027)	(0.039)	(0.023)	(0.024)	(0.039)	(0.038)	(0.027)	(0.039)	(0.023)	(0.024)
Age	0.020***	0.024***	-0.007	0.001	0.003	0.003	0.023***	0.028***	-0.011	-0.008	0.012**	0.010*
	(0.007)	(0.008)	(0.006)	(0.012)	(0.004)	(0.005)	(0.008)	(0.009)	(0.008)	(0.012)	(0.005)	(0.006)
Experience	0.010***	0.010***	0.0001	0.003	0.005	0.006	0.010***	0.010***	0.0002	0.003	0.005	0.006
	(0.004)	(0.003)	(0.0004)	(0.009)	(0.004)	(0.005)	(0.003)	(0.003)	(0.001)	(0.010)	(0.004)	(0.005)
Education	0.020**	0.023**	0.001	-0.009	-0.021**	-0.019**	0.019**	0.023**	0.002	-0.009	-0.020**	-0.017**
	(0.009)	(0.010)	(0.002)	(0.017)	(0.009)	(0.008)	(0.008)	(0.010)	(0.004)	(0.016)	(0.009)	(0.007)
Contract	0.006	0.010	0.000	0.000	0.000	0.000	0.006	0.010	0.000	0.000	0.000	0.000

	(0.005)	(0.007)	(0.003)	(0.001)	(0.000)	(0.000)	(0.005)	(0.008)	(0.003)	(0.001)	(0.000)	(0.000)
Certificate	0.001**	0.001**	-0.010	-0.014	-0.001	-0.001	0.001**	0.001**	-0.010	-0.014	-0.001	-0.001
	(0.001)	(0.0004)	(0.012)	(0.016)	(0.001)	(0.002)	(0.001)	(0.0005)	(0.012)	(0.016)	(0.001)	(0.002)
Occupation	0.027	0.018	0.014	0.025***	-0.009	-0.019*	0.027	0.018	0.013	0.026***	-0.010	-0.020*
	(0.021)	(0.018)	(0.015)	(0.009)	(0.010)	(0.012)	(0.021)	(0.018)	(0.015)	(0.009)	(0.011)	(0.012)
Marriage	-0.008***	0.006***	0.011	-0.004	-0.003***	0.005***	-0.003***	0.004***	0.011	-0.004	-0.001***	0.006***
	(0.001)	(0.001)	(0.007)	(0.003)	(0.001)	(0.002)	(0.0005)	(0.001)	(0.007)	(0.003)	(0.0005)	(0.002)
Asset	-0.053***	-0.041***	-0.027**	-0.035**	-0.020***	-0.016***	-0.052***	-0.040***	-0.027**	-0.035**	-0.020***	-0.016***
	(0.014)	(0.011)	(0.013)	(0.017)	(0.007)	(0.006)	(0.014)	(0.011)	(0.013)	(0.016)	(0.007)	(0.006)
Training	-0.002	-0.002	-0.001	0.004	0.002	0.003	-0.002	-0.002	-0.001	0.004	0.002	0.003
	(0.004)	(0.004)	(0.002)	(0.008)	(0.003)	(0.004)	(0.004)	(0.004)	(0.002)	(0.007)	(0.003)	(0.004)
Discrimination effect	0.132***	0.107***	0.315***	0.324***	0.137***	0.132***	0.482***	0.460***	1.237***	1.250***	0.642***	0.639***
	(0.014)	[0.000]	(0.038)	[0.000]	(0.007)	[0.000]	(0.014)	[0.000]	(0.044)	[0.000]	(0.008)	[0.000]
Selection bias effect	-	-	-	-	-	-	-0.357	-0.357	-0.920	-0.920	-0.516	-0.516
Δ gap (public-private)	-0.341	-0.341	-0.169	-0.169	-0.067	-0.067	-0.341	-0.341	-0.169	-0.169	-0.067	-0.067
Δ endowment	0.009	-0.023	-0.017	0.099	-0.086	-0.08	0.006	0.073	0.149	0.167	-0.095	-0.097
Δ discrimination	-0.350	-0.318	-0.153	-0.269	0.018	0.013	-3.658	-3.725	-1.325	-1.344	0.092	0.094

Continued 3

	OLS						Selection bias adjusted					
	LK		UA		VN		LK		UA		VN	
	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N	B-O	N
Gender wage gap in public	0.014	0.014	0.450***	0.450***	0.181***	0.181***	0.014	0.014	0.450***	0.450***	0.181***	0.181***
	(0.090)	(0.090)	(0.056)	(0.056)	(0.067)	(0.067)	(0.090)	(0.090)	(0.056)	(0.056)	(0.067)	(0.067)
Endowment effects	-0.128**	-0.143***	0.030	0.069**	0.0002	0.028	0.067*	-0.093***	0.034	0.104***	0.034	0.036
	(0.051)	(0.049)	(0.028)	(0.027)	(0.035)	(0.031)	(0.039)	(0.032)	(0.027)	(0.022)	(0.060)	(0.059)
Age	-0.016	-0.002	0.023	0.024**	-0.038***	-0.038***	0.006	0.008	0.025*	0.035***	-0.060***	-0.069***
	(0.014)	(0.006)	(0.015)	(0.009)	(0.011)	(0.010)	(0.022)	(0.008)	(0.014)	(0.010)	(0.022)	(0.024)
Experience	-0.001	-0.001	-0.005	-0.010	0.026	0.018	-0.001	-0.001	-0.005	-0.010	0.026	0.018
	(0.009)	(0.015)	(0.004)	(0.008)	(0.017)	(0.012)	(0.009)	(0.015)	(0.004)	(0.008)	(0.017)	(0.012)
Education	-0.122***	-0.112***	-0.047***	-0.080***	0.022	0.023	0.055***	-0.055***	-0.044***	-0.055***	0.050	0.050
	(0.041)	(0.038)	(0.012)	(0.021)	(0.020)	(0.021)	(0.018)	(0.019)	(0.011)	(0.014)	(0.044)	(0.044)
Contract	0.006	0.001	0.000	0.000	0.0002	-0.0001	0.007	0.001	0.000	0.000	0.0002	-0.0001
	(0.004)	(0.001)	(0.000)	(0.000)	(0.002)	(0.0001)	(0.005)	(0.001)	(0.000)	(0.000)	(0.002)	(0.001)
Certificate	-0.005**	-0.004**	-0.013***	0.007***	-0.0003	-0.001	-0.007**	-0.006**	-0.014***	0.008***	-0.0004	-0.001
	(0.002)	(0.002)	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)	(0.002)	(0.005)	(0.003)	(0.001)	(0.002)
Occupation	0.034**	0.007	0.071***	0.122***	0.011	0.033***	0.039***	-0.005	0.071***	0.122***	0.013	0.033***
	(0.013)	(0.011)	(0.016)	(0.018)	(0.013)	(0.010)	(0.013)	(0.011)	(0.016)	(0.018)	(0.013)	(0.009)

Marriage	-0.004	-0.001	-0.012	-0.003	-0.017**	-0.006**	-0.007	-0.001	-0.012	-0.003	0.009**	0.006***
	(0.007)	(0.002)	(0.008)	(0.002)	(0.007)	(0.003)	(0.013)	(0.002)	(0.008)	(0.002)	(0.004)	(0.002)
Asset	-0.027***	-0.031***	0.020**	0.010**	0.001	0.003	-0.033***	-0.032***	0.020**	0.010**	0.002	0.003
	(0.001)	(0.011)	(0.009)	(0.004)	(0.002)	(0.004)	(0.012)	(0.012)	(0.009)	(0.004)	(0.002)	(0.004)
Training	0.007**	-0.0003**	-0.007	-0.002	-0.005*	-0.004*	0.010**	-0.001**	-0.007	-0.002	-0.005*	-0.004*
	(0.003)	(0.0001)	(0.007)	(0.002)	(0.003)	(0.002)	(0.004)	(0.0004)	(0.007)	(0.002)	(0.003)	(0.002)
Discrimination effect	0.142***	0.157***	0.421***	0.382***	0.181***	0.153***	1.081***	1.241***	0.757***	0.687***	0.415***	0.413***
	(0.021)	[0.000]	(0.016)	[0.000]	(0.015)	[0.000]	(0.046)	[0.000]	(0.017)	[0.000]	(0.018)	[0.000]
Selection bias effect	-	-	-	-	-	-	-1.134	-1.134	-0.341	-0.341	-0.268	-0.268
Gender wage gap in private	0.487***	0.487***	0.310***	0.310***	0.171***	0.171***	0.487***	0.487***	0.310***	0.310***	0.171***	0.171***
	(0.079)	(0.079)	(0.048)	(0.048)	(0.064)	(0.064)	(0.079)	(0.079)	(0.048)	(0.048)	(0.064)	(0.064)
Endowment effects	0.011	0.039	0.049**	0.073***	-0.046	-0.037	0.009	0.025	0.050**	0.073***	-0.037	-0.029
	(0.030)	(0.030)	(0.024)	(0.020)	(0.033)	(0.033)	(0.031)	(0.033)	(0.024)	(0.020)	(0.036)	(0.034)
Age	-0.001	0.020***	0.019	0.015**	-0.009	-0.012	-0.002	0.008**	0.020	0.015**	0.002	-0.004
	(0.007)	(0.007)	(0.012)	(0.007)	(0.013)	(0.008)	(0.006)	(0.004)	(0.013)	(0.007)	(0.011)	(0.006)
Experience	-0.006	-0.002	-0.014**	-0.008**	0.002*	0.010*	-0.006	-0.003	-0.014**	-0.008**	0.002*	0.010*
	(0.004)	(0.002)	(0.006)	(0.003)	(0.001)	(0.005)	(0.004)	(0.002)	(0.006)	(0.003)	(0.001)	(0.005)
Education	-0.006	-0.004	0.000	-0.0000	-0.005	-0.006	-0.006	-0.007	0.000	-0.0000	-0.006	-0.006
	(0.013)	(0.009)	(0.001)	(0.004)	(0.015)	(0.018)	(0.013)	(0.015)	(0.001)	(0.004)	(0.019)	(0.019)
Contract	-0.0002	-0.0004	0.008	0.006	0.001	0.0002	-0.0002	-0.0003	0.008	0.006	0.001	0.0003

	(0.002)	(0.0050	(0.007)	(0.005)	(0.005)	(0.001)	(0.002)	(0.005)	(0.007)	(0.005)	(0.006)	(0.001)
Certificate	-0.0001	-0.001	0.002**	0.004**	0.001	0.0004	-0.0001	-0.001	0.002**	0.004**	0.001	0.0004
	(0.001)	(0.005)	(0.001)	(0.002)	(0.003)	(0.002)	(0.001)	(0.005)	(0.001)	(0.002)	(0.003)	(0.002)
Occupation	-0.019	-0.013	0.041**	0.058***	-0.033*	-0.026*	-0.019	-0.015	0.041**	0.058***	-0.033*	-0.026*
	(0.017)	(0.014)	(0.019)	(0.016)	(0.018)	(0.014)	(0.017)	(0.015)	(0.019)	(0.016)	(0.018)	(0.014)
Marriage	0.012**	0.017**	-0.004	0.0003	0.0002	0.001	0.011**	0.020**	-0.004	0.0003	0.001	0.001
	(0.006)	(0.008)	(0.003)	(0.0002)	(0.001)	(0.002)	(0.006)	(0.010)	(0.003)	(0.0002)	(0.002)	(0.003)
Asset	0.020*	0.020*	-0.002	-0.003	-0.005	-0.004	0.020*	0.021*	-0.002	-0.003	-0.006	-0.005
	(0.012)	(0.012)	(0.003)	(0.004)	(0.005)	(0.004)	(0.012)	(0.012)	(0.003)	(0.004)	(0.006)	(0.004)
Training	0.012***	0.002***	-0.0002	0.0001	0.002	-0.0003	0.012***	0.001***	-0.0002	0.0001	0.002	-0.0003
	(0.004)	(0.001)	(0.0003)	(0.0001)	(0.003)	(0.0004)	(0.004)	(0.0004)	(0.0003)	(0.0001)	(0.003)	(0.0003)
Discrimination effect	0.476***	0.448***	0.261***	0.237***	0.217***	0.208***	0.364***	0.348***	0.100***	0.077***	0.554***	0.547***
	(0.020)	[0.000]	(0.010)	[0.000]	(0.014)	[0.000]	(0.020)	[0.000]	(0.012)	[0.000]	(0.015)	[0.000]
Selection bias effect	-	-	-	-	-	-	0.114	0.114	0.160	0.160	-0.346	-0.347
Δ gap (public-private)	-0.473	-0.473	0.140	0.140	0.010	0.010	-0.473	-0.473	0.140	0.140	0.010	0.010
Δ endowment	-0.139	-0.182	-0.019	-0.004	0.0462	0.065	0.058	-0.118	-0.016	0.031	0.071	0.065
Δ discrimination	-0.334	-0.291	0.16	0.145	-0.036	-0.055	0.717	0.893	0.657	0.61	-0.139	-0.134

Appendix B: Formula

Derivation of the structure model for water demand system:

$$Q_d = D(P,\ Y,\ TEMP,\ RF) \text{ (Water Demand)}$$

$$Q_s = S(P,\ R,\ TEMP,\ RF) \text{ (Water Supply)}$$

$$Q_d = Q_s \text{ (Market equilibrium)}$$

Apply the total derivative on each equation to get:

$$\frac{dQ_d}{Q_d} = \frac{\partial Q_d}{\partial P}\frac{P}{Q_d}\frac{dP}{P} + \frac{\partial Q_d}{\partial Y}\frac{Y}{Q_d}\frac{dY}{Y} + \frac{\partial Q_d}{\partial TEMP}\frac{TEMP}{Q_d}\frac{dTEMP}{TEMP} + \frac{\partial Q_d}{\partial RF}\frac{RF}{Q_d}\frac{dRF}{RF},$$

$$\frac{dQ_s}{Q_s} = \frac{\partial Q_s}{\partial P}\frac{P}{Q_s}\frac{dP}{P} + \frac{\partial Q_s}{\partial R}\frac{R}{Q_s}\frac{dR}{R} + \frac{\partial Q_s}{\partial TEMP}\frac{TEMP}{Q_s}\frac{dTEMP}{TEMP} + \frac{\partial Q_s}{\partial RF}\frac{RF}{Q_s}\frac{dRF}{RF},$$

$$\frac{dQ_d}{Q_d} = \frac{dQ_s}{Q_s}$$

where, $\frac{\partial Q_d}{\partial P}\frac{P}{Q_d}$ can indicate the price-demand elasticity, $\frac{\partial Q_s}{\partial P}\frac{P}{Q_s}$ represents the price-supply elasticity, $\frac{\partial Q_d}{\partial Y}\frac{Y}{Q_d}$ is the demand-income elasticity, and so on.

Then we can simplify the total differential equations as

$$Q_d^* = \eta_p P^* + \eta_Y Y^* + \eta_T TEMP^* + \eta_{RF} RF^*$$

$$Q_s^* = \varepsilon_p P^* + \varepsilon_R R^* + \varepsilon_T TEMP^* + \varepsilon_{RF} RF^*$$

$$Q_d^* = Q_s^* = Q^*$$

in which, $Q_d^* = \frac{dQ_d}{Q_d}$, $P^* = \frac{dP}{P}$, $Y^* = \frac{dY}{Y}$, etc. These parameters indicate the percentage change of each factor. Solve the above equations, and then we can get the reduced functional forms for both price and water consumption as

$$P^* = \frac{\eta_Y}{\varepsilon_p - \eta_p} Y^* - \frac{\varepsilon_R}{\varepsilon_p - \eta_p} R^* + \frac{\eta_T}{\varepsilon_p - \eta_p} TEMP^* + \frac{\eta_{RF}}{\varepsilon_p - \eta_p} RF^*$$

$$Q^* = \frac{\varepsilon_p \eta_Y}{\varepsilon_p - \eta_p} Y^* - \frac{\varepsilon_R \eta_p}{\varepsilon_p - \eta_p} R^* + \frac{\varepsilon_p \eta_T - \varepsilon_T \eta_p}{\varepsilon_p - \eta_p} TEMP^* +$$

$$\frac{\varepsilon_p \eta_{RF} - \varepsilon_{RF} \eta_p}{\varepsilon_p - \eta_p} RF^*$$

Both two reduced-form equation can be estimated by the log-log model as

$$lnp = \alpha_1 lnY + \alpha_2 lnR + \alpha_3 lnTEMP + \alpha_4 lnRF + \alpha_0$$

$$lnQ = \beta_1 lnY + \beta_2 lnR + \beta_3 lnTEMP + \beta_4 lnRF + \beta_0$$

Each parameter is corresponding to the item of the same position in those two reduced-form equations. For example:

$$\frac{P^*}{Y^*} = \frac{\eta_Y}{\varepsilon_p - \eta_p} = \frac{\partial lnP}{\partial lnY} = \alpha_1 \text{ and } \frac{P^*}{R^*} = -\frac{\varepsilon_R}{\varepsilon_p - \eta_p} = \frac{\partial lnP}{\partial lnR} = \alpha_2$$

$$\frac{Q^*}{Y^*} = \frac{\varepsilon_p \eta_Y}{\varepsilon_p - \eta_p} = \frac{\partial lnQ}{\partial lnY} = \beta_1 \text{ and } \frac{Q^*}{R^*} = -\frac{\varepsilon_R \eta_p}{\varepsilon_p - \eta_p} = \frac{\partial lnQ}{\partial lnR} = \beta_2$$

where, α_1, α_2, β_1 and β_2 report the total elasticities for the water price and water consumption.