Parental wage penalty: The case of Mongolia

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Abstract

In Mongolia, since the early 2000s, female labor force participation is declining down to 50.6 percent in 2023 (National Statistics Office, 2024). It raises serious concern about the long-term economic growth and the country's future in general. In this paper we investigate the existence and the extent of the parental wage penalty including motherhood wage penalty as a potential factor that prevents young women to enter and re-enter into the labor force. Based on data from the Mongolian Household Socio-Economic Survey 2018, we find that the parental wage premium is 11.93 percent, the fatherhood wage premium is 19.30 percent, and the motherhood wage penalty is 21.30 percent, respectively. These findings are obtained after controlling for individual observed heterogeneities such as a range of human capital characteristics, working industry, and occupation. We also find that the parental wage penalty differs by education, location, marital status and occupation. Our research findings echo and update previous literature on the topic and can be used for comparative studies with the incoming research in developing and transition economies. Our research has a few limitations. A first limit of our analysis is that we did not focus on the causality of the wage penalty. The second limit is that we did not focus on the changes in the wage penalty since our data is one cross section data from HSES 2018 Mongolia. Parental wage penalty can change over time, and parental leave policies may play a role in this regard. This is avenue for the future research.

Keywords: parental and motherhood wage penalty; decomposition analysis; Mongolia
JEL Classification: J24; J31; P23

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Абстракт

Монгол Улсын эмэгтэйчүүдийн ажиллах хүчний оролцоо 2000-аад оны эхэн үеэс буурсаар 2023 онд 50.6 хувьд хүрсэн нь эдийн засгийн ерөнхий төлөв байдал болон урт хугацааны өсөлтийн талаар санаа зовниход хүргэж байна. Энэхүү судалгааны ажилд эцэг, эхийн цалингийн торгууль, түүний дотор залуу эмэгтэйчүүдийг ажиллах хүчинд орох, дахин ороход саад учруулах боломжтой хүчин зүйл буюу ээжүүдийн цалингийн торгууль Монгол Улсын хөдөлмөрийн зах зээлд байгаа эсэх?, цаашлаад түүний цар хүрээг 2018 оны ӨНЭЗС ашиглан судаллаа. Хувь хүний хүмүүн капиталын шинж чанар, ажиллаж буй салбар, ажил мэргэжил зэргийг хянасны дараах шинжилгээний үр дүнд эцэг эхийн цалингийн урамшуулал 11.93 хувь, аавуудын цалингийн урамшуулал 19.30 хувь, ээжүүдийн цалингийн торгууль 21.30 хувь байна. Энэхүү цалингийн торгууль эсвэл урамшууллын хэмжээ нь боловсрол, байршил, гэрлэлтийн байдал болон мэргэжлээр ялгаатай байна. Судалгааны үр дүн энэ сэдвээрх өмнө хийгдэж байсан судалгааны ажлуудыг шинэчилж байгаа ба цаашид хөгжиж буй шилжилтийн эдийн засагтай орнуудын харьцуулсан судалгаанд ашиглах боломжтой. Энэхүү судалгаа нь дараах хязгаарлалттай. Нэгдүгээрт, бид цалингийн торгуулийн учир шалтгааныг авч үзээгүй. Хоёрдугаарт, шинжилгээнд 2018 оны зэрэгцүүлсэн тоон мэдээлэл ашигласан тул цалингийн торгуулын цаг хугацааны өөрчлөлтийг судлаагүй. Цалингийн торгуулийн хэмжээ цаг хугацааны турш өөрчлөгдөх боломжтой ба үүнд эцэг эхийн чөлөө олгох бодлого чухал үүрэгтэй. Цаашид цалингийн торгуулийн цаг хугацааны өөрчлөлтийг судалж, судалгааг өргөтгөх боломжтой.

1 Introduction

Under socialist rule, Mongolia had a strong pronatalist population policy under which those families having children were provided with generous benefits. The changes made to these policies have had a considerable impact on fertility and family formation in Mongolia. In the mid-1970s, the country started to experience a dramatic decrease in the level of fertility, which intensified when the country moved towards a market economy. The country experienced a drop in its total fertility rate (TFR) from 7.2 children per woman (of reproductive age) in 1975 to about 3 children in 1995, and it has remained constant at about 2.3 children since that time. (National Statistics Office, 2020). Relatively few studies have been carried out on fertility changes in Mongolia with explanations about their causes. One obvious candidate is the wage gap between mothers and non-mothers (the motherhood wage penalty). Similarly, to our knowledge, there is no research has been done on parental wage penalty in Mongolia.

The parental and motherhood wage penalty is a well-documented phenomenon in labor economics literature. Maternity can have a negative impact on women's opportunities compared to men's in the labor market not only through the decrease of hours devoted to work, but also through career interruptions, loss of human capital while child caring, smaller mobility compared to women without children, lower productivity on the job during the period when children are small, as well as due to statistical discrimination (Budig, England, 2001, Waldfogel, 1997, 1998). If motherhood wage penalty is greater than the fatherhood wage penalty, then it will exacerbate gender inequality. Because of motherhood, women's lifetime earnings will be lower than men's. Gender equality in lifetime earnings will affect their pension income, to the gap in poverty rates between mothers and non-mothers and between mothers and fathers. Thus, an estimate of motherhood and parental wage penalties is important and relevant for social policy.

Documenting the existence and extent of the motherhood and fatherhood wage penalty in Mongolia is very timely and policy relevant, given the serious concerns about the declining labor supply for females and stagnant labor supply for males (See Figure 1 in the appendix). In Mongolia, maternity leave is financed from two different sources and for two different stages. All pregrant women , starting from 5th month of pregnancy, receive a monthly cash transfer regardless of pre-birth employment status, a monthly monetary transfer of 40,000 MNT[1] (11.7USD) until a birth of a child or children. If a mother gives a birth to twin children, flat-rate 2,000,000 MNT, if she gives a birth to triplets, then 3,000,000 MNT. Before the birth, pregnant women, who are in employment, and who contribute to social security system, she is entitled to a maternity benefits from earning related payment, or payment equal to 2 full months salary. Moreover, if a pregnant woman is employed then her job is guaranteed for 36 months after the birth of child by the Law of Labor of Mongolia which was updated in 2021[2].

After a birth, women who was working and who was contributing to social security system, they are entitled to a maternity benefits from earning related payment, or payment equal to 2 full months' salary. Thus, in the total, mothers receive 4 months equal salary in Mongolia, only if they were contributing social security payments, and 2 months before the birth, and 2 months' salary after the birth. The maternity benefits are financed from

[1]MNT-Mongolian Tugruk, currency. As of February, 2024 rate announced by the Central bank of Mongolia 1USD=3,400 MNT.

[2]https://legalinfo.mn/mn/detail/16230709635751?fbclid=IwAR0KX8SOEqfBetvo65Vc8RhDKT38Iy-MAWGv0S4-fEHoCsQmIVU75IVCPlI

Social Security Fund of Mongolia. After the birth, all women who is taking care of children aged 0-3, do receive a monthly transfer money regardless of pre-birth employment status, about 50,000 MNT[3] (14.7 USD). Pre-birth and post-birth monthly cash transfers are financed from Social Welfare Fund of Mongolia. Fathers receive at maximum 10 days paid leave of absence after a birth of a child. If a person adopts a child, then a father or mother is eligible for 2 months paid paternity leave.

Second, Mongolia has an extensive network of public childcare facilities which can accommodate children from 2 to 5 years that are funded by the central and local government. So after a birth, mothers receive a full salary only for 2 months, and state financed kindergartens receive children starting from 2 years. So there is a gap of 22 months until mothers can enroll their children into full day kindergartens that enables them to return to the job position. Even after returning to her job, women's wages are consistently lower than non-mothers as it was described in Table 1. This fact shows that parenthood is costly, especially motherhood in terms of employment (Betrand, et al, 2010, Ganguil et al, 2014), growing career advancement (Kleven et al 2019), higher wages, spending time on unpaid childcare, gender norm pressure, declining bargaining power, labor market discrimination (Altonji and Blank, 1999, Schimillen and Weimann-Sandig, 2018). Many researchers emphasize that despite societal expectations of high-quality care, mothers face occupational segregation, reduced employment, discrimination at hiring, and promotion connected to perceptions of incompetence and lack of commitment, and loss of tenure, skills, and other components of human capital during childcare breaks (Budig and England, 2001; Correll et al., 2007; Budig et al., 2012; Boeckmann et al., 2015).

Nikolova and Polansky (2022), using Mongolian Household Socio-Economic Survey collected by the National Statistics Office of the country in 2016 with 16,500 households in the sample. They found that women with one child between the ages of 0 and 1 are 35.5 percentage points less likely to be employed, and women with two children between the ages of 1 and 6 are 16.1 percentage points less likely to be employed compared to women with small children (aged 0-1) whereas having older children (aged 6-17) has no effect on female employment in Mongolia. For men, the effect is ambiguous, they found.

Mothers, unlike childless women, spend more time on unpaid childcare. Banzragch et al (2024) using Mongolian Time Use Survey of 2019, with a sample size of 4,000 households from rural and urban areas, estimated that Mongolian women spend more time on their children aged 0-2 years (an average of 169 minutes per day), than on their children aged 3-5 years (on average about 35 minutes per day). On the other hand, Mongolian men spend more than 90 minutes taking care of children aged 0-2 years and 3-5 years old. In other words, Mongolian women spend 1.8 times more time on unpaid childcare.

Motherhood wage penalty has become a key component of gender wage gaps in labor markets, but its size and roots still need to be investigated. (Gupta and Smith, 2002, Ponthieux and Meurs, 2015, Mari, Cutuli, 2021). But few studies have been done in the cases of developing countries, including the transition economies such as Ukraine and Turkey. Nizalova et al (2016) estimated the motherhood wage penalty in Ukraine using the Ukrainian Longitudinal Monitoring Survey from 1997 to 2007 and the authors found that it is about 19 percent. To the best of our knowledge, there is no estimates have been done on parental wage gap and motherhood wage penalty in the case of Mongolia. Thus, we aim to examine:

[3]MNT-Mongolian Tugruk, currency. As of February, 2024 rate announced by the Central bank of Mongolia 1USD=3,400 MNT.

1. What is the parental wage penalty in Mongolia?
2. What is the motherhood wage penalty in Mongolia?
3. What is the fatherhood wage penalty in Mongolia?

This article adds to the present understanding of gender wage gap, motherhood and fatherhood wage penalty or premium, particularly in transition economies. The remainder of the paper is organized as follows. Section 2 provides an overview of the previous literature concerning the motherhood wage penalty. The underlying methodology and the used data are explained in Section 3. Findings including descriptive statistics and estimation results as well as econometric issues revealed to the current analysis are discussed in Section 4, while Section 5 offers conclusions.

2 Literature Review

There is significant research on gender wage gap (Waldfogel, 1997, Budig and England, 2001, Correll et al, 2007 England et al, 2016). As well as in Mongolia, researchers conclude that there is a considerable gender wage gap in Mongolia as well. For instance, Batchuluun and Dalkhjav (2019) examined the gender wage gaps using the data from three periods of the Labor Force Surveys conducted in 2002–2003, 2007–2008, and 2010. They used real hourly wage and decomposed the gender wage gap at the mean using Oaxaca–Blinder decomposition. The unconditional gender wage gaps were 4.3 and 9 percent. The authors note that in Mongolia if women had similar endowments as men, then the wage gap would have been twice larger than the present level. Pastore (2009) using a School to Work Survey conducted in 2006 on young people aged 15-29 years, found that on average, for young people, female wages are not lower than those of males for 15-19 years old. However, women have a much higher average educational level than thus the conditional gender gap becomes significant and sizeable for those who are over-20 years old. Pastore confirms that if wages were paid equally, women should have 11.7 percent more considering only their educational advantage which is a substantial gap for the low earnings of Mongolians. However, as we see from the literature, there is wage gap among women, between mothers and non-mothers, thus does not describe the labor market experience of all employed women. Since the transition to a market economy, Mongolia has been experiencing the declining female labor supply to 50.6 percent in 2023, and stagnating male labor supply (Alzua, Batbekh, Batchuluun, Dalkhjav and Galdo, 2020, World Bank, 2023. NSO, 2024). This raises concerns about further declines in the rate of economic growth, as well as sustainability of the pension system and, therefore, calls for the prioritization of policies affecting demographic trends. Nikolava and Polansky (2022)

There are several strands of the research literature on motherhood wage penalty. The first strand, is an estimation, comparative studies. Hill (1979) was one of the first researchers to investigate the impact of motherhood on wages. Waldfogel (1997, 1998a, 1998b) estimated the motherhood wage penalty at 8 percent per child for the US labor market, while his fixed-effect model estimation results were 4.6 percent for the first child and 12.6 percent for two or more children. Assuming a priori that decreased work effort is responsible for the reduced wage of mothers, Anderson et al. (2002) did not obtain such a finding. They found a 3 percent and 6 percent wage penalty for one child and two or more children, respectively. A very influential study from Budig and England (2001) determined a 7 percent wage penalty for each child between 1982 and 1993 in the US.

There is no motherhood wage penalty exists in Finland, Sweden, Belgium, Israel, but a lower degree of penalty exists in France, Canada, UK, Poland, Slovakia and Czech R. about at 5-10 percent. Some countries, like in US, Russia and Hungary, Ukraine have moderate degree of the penalty of 10-19 percent, while a high level, about 20-33 percent exists in most of continental Europe and Ireland (Budig, Misra, and Boeckmann 2012, Nizalova, Sliusarenko and Shpak, 2016).

The second strand in the literature is focused on causality. Researchers have some explanations for the association between motherhood and lower wages they have been offered. First explanation is connected to human capital theory, less job experience, less skills, less education (Budig, England, 2001). Employment pattern for mothers is different from fathers, non-mothers and non-fathers. Mothers take career breaks to provide unpaid childcare while men do not except in the countries like Sweden. (Kingsbury, 2019). The second reason is mothers may trade-off stressful, time poor higher wages for "mother-friendly" jobs that are easier to combine with parenting. (Waldfogel, 1997, Budig, England, 2001). Third, employers may discriminate against mothers, who ask for more leaves, short workdays, etc.

The third strand in the literature is that some authors have explored that the existing cross-country variation in motherhood wage penalty could be caused by the variation in family policies such as parental leave, subsidized or publicly provided childcare, etc. These maternal/parental leave policies are usually aimed to positively affect female labor supply, however, they do impose considerable non-wage costs on employers which in the equilibrium are transmitted into lower wages for women (Ruhm 1998). A provision of subsidized or publicly provided childcare, which increases women's incentives to paid work is borne by taxpayers and therefore is not passed directly or indirectly onto working mothers or working women in general. Thus, some researchers found that the different level of coverage of these policies have been considered as potential explanations for the cross-country differences in the motherhood wage penalty (Gangl and Ziefle 2009).

Another strand of literature relates the motherhood wage penalty and family policies related to cultural norms regardless of the public policies. Some cultures support maternal employment, some do not while support the male breadwinner/female caregiver model (Budig, Misra, and Boeckmann 2012).

However, research on fatherhood wage penalty mostly conclude that a being a father has a negligible adverse effect or no effect on men's labor supply and wages; it is even associated with a fatherhood wage premium in some cases (Killewald, 2013; Waldfogel, 1998; Addati et al., 2018; Glauber, 2018; Grimshaw and Rubery; 2015; Weeden et al., 2016; Cukrowska-Torzewska and Lovász, 2017; Kleven et al., 2019, Dias et al., 2020).

The last strand frequently discussed in the literature is selection bias, which occurs when working women with children are not a random sample of the female population who have children or when mothers' job choices are not random. Selection bias in household surveys can be corrected using alternative approaches. A frequently used model in motherhood wage penalty literature is Heckman's (1979) selection bias correction procedure which allows the researcher to deal with the high degree of non-randomness inherent in female labor force participation (Harkness and Waldfogel, 2003; Glauber, 2007; Krepp, 2007; Mandel and Semyonov, 2005; Budig et al., 2012; Nizalova and Sliusarenko, 2013; Zhao, 2018; Cukrowska-Torzewska and Matysiak, 2020; Villanueva and Lin, 2020). This study does not employ Heckman's (1979) method to account for the sample selection bias.

Studies conducted for different countries show significant differences in motherhood

wage penalty due to the difference in the estimation method and the differences in the institutional and cultural structure between countries. Researchers have estimated motherhood wage penalty using different methodologies and data sets. Moderate motherhood wage penalty was estimated for the case of Spain which is between 16 percent for Spain and for Ireland 21 percent (Budig, Misra, and Boeckmann 2012).

Developing country studies on motherhood wage penalty are mainly held for Latin American countries. Villanueva and Lin (2006), Olarte and Pena (2010), and Piras and Ripani (2005) found significant motherhood wage penalties in Latin American countries, which are significantly higher relative to developed countries' cases. Analyzing the motherhood wage penalty between 1997 and 2007, Nizalova et al. (2016) found a 19 percent motherhood wage penalty in the Ukrainian labor market. The motherhood wage penalty in Turkey has been examined at 29.6 percent Tansever. (2021).

3 Methodology and Data

3.1 Methodology

The unconditional gap means the difference in wages between mothers and non-mothers and fathers and non-fathers. A conditional wage gap means decompose the observed motherhood and fatherhood wage gap on differences in their characteristics, preferences and constraints. We use Blinder- Oaxaca decomposition method. The Oaxaca-Blinder decomposition technique attempts to identify the extent to which the motherhood and fatherhood wage gap is due to human capital or other factors such as discrimination.

We will estimate separate regression equations for mothers vs non-mothers and fathers vs non-fathers which will identify different rates of return to human capital characteristics and the remainder of the rates we will determine as discrimination. We will use ordinary least squares (OLS) regression models:

$$Y_{mother} = X_m + B_m + u_m \tag{1}$$

$$Y_{non-mother} = X_f + B_f + u_f \tag{2}$$

where Y is the independent variable log wage of a worker, mother is for mothers and non-mothers is for females but not mothers, X is vector of explanatory variables, and u is error term. The research literature suggests to estimate two stage regressions for 2018 in the following:

The first stage: Human Capital Specification

Estimating (1) and (2) regression equations using X= education, work experience, work experience squared, marital status, urban/rural, region. The effect of the education and work experience are the main sources of the observed wage differentials (Becker, 1981;1993: Mincer, 1974; Blau and Kahn, 2000; 2003). The effect of having children of men and women on their wage has been investigated here.

The second stage: Full Specification

Estimating (1) and (2) regression equations using X= age, education, work experience, work experience square, marital status, urban/rural dummy, occupation, industry dummies for mothers, nonmothers and fathers and non-fathers.The estimates will be completed by using the two decomposition methods:

$$\bar{Y}_{non-mother} - \bar{Y}_{mother} = b_{non-mother}\bar{X}_{non-mother} - b_{mother}\bar{X}_{mother} = b_{non-mother}(\bar{X}_{non-mother} - \bar{X}_{mother}) + \bar{X}_{mother}(b_{non-mother} - b_{mother}) \tag{3}$$

$$\bar{Y}_{non-mother} - \bar{Y}_{mother} = (\beta_0^{non-mother} - \beta_0^{mother}) + (\beta_1^{non-mother} - \beta_1^{mother}) + (\beta_2^{non-mother} - \beta_2^{mother}) + ...(\varepsilon^{non-mother} - \varepsilon^{mother}) = G_0 + G_1 + G_2 \quad (4)$$

Where b represents estimates of the equations (1) and (2), X denotes explanatory variables, non-mothers and mothers are denoted as non-mothers (nm) and mothers (m) so that the gap between non-mothers and mothers can be estimated as being due in part to (i) Differences in the intercepts G_0, (ii) Differences in X_1 and β_1 or G_1, and (iii) Differences in X_2 and β_2 or G_2. In addition, nm denotes non-mothers in short and m denotes mothers. For non-fathers and fathers, and non-parents and parents, we use equations (3) and (4).

3.2 Data

We used the Household Socio-Economic Survey that was conducted before the Covid-19, in 2018. Mongolia first conducted the HSES in 2007-2008. The HSES was technically supported by the World Bank and conducted corresponding international standards and methodologies. The HSES is a nationwide survey aimed at determining the level of living and poverty of the population, as well as calculating household income and expenditure, updating the baskets and weights used in the consumer price index, and providing information needed to calculate GDP by consumption method. Survey data has been collected using a tablet (CAPI) since 2014.

About the sampling, Mongolia has 21 provinces and Ulaanbaatar, the capital city of Mongolia, has 9 districts. The survey covers all 21 provinces (aimags in Mongolian) and 9 districts. The sampling unit of the survey is the household and household members also the HSES covers only the population in private households. All age members of the selected households are mandatorily surveyed. (NSO, 2018).

The HSES utilized a two-stage probability sampling method to select households from four different residential areas: Ulaanbaatar, provincial centers (aimags in Mongolian), soum centers, and rural regions. In the initial stage, the primary sampling unit (PSU) was chosen based on equal distribution proportional to its size. In Second stage, households were selected using the simple random sampling method through PSU. Regarding the sample distribution of HSES, it was allocated by the proportional probability sampling method. In doing so, the number of households in the province was distributed proportionally to each settlement. (NSO, 2018)

The HSES 2018 collected data on 16,454 households with 59,820 individuals in the total. 49 percent of the data is males and 51 percent is females. In Mongolia, women can retire at the age of 55, whereas men can retire at the age of 60. Also following the common approach used in the research literature, our sample is restricted to working age women 15-55 years and men aged 16-60. Limiting our research sample by retirement age aims to clarify the individuals who are just at their legally or formal working age and are earning their primary income, not additional side earnings. Additionally, restrictions based on legally or formal working age are crucial for addressing formal labor market discrimination. Out of a total 35,419 observations in the sample, 49.52 percent or 17,538 are females, while 50.48 percent or 17,881 are males. About demographic characteristics of the sample, 59.71 percent is married and 40.29 percent of the total surveyed individuals is single. Furthermore, living in urban or rural area has a significant impact on a person's

economic and social capabilities, so we provide descriptive statistics by urban/rural ratios for each subgroup. Most of the individual live in urban areas, except for men without children.

4 Findings

4.1 Descriptive statistics

From Table 1 we can see that parents are younger (32.80 years) than non-parents (38.61 years). Also the parents have less work experience (11.97 years) than non-parents (20.28 years) since childcare can lead to withdrawal from the labor market. One more fact is that parents on average seem to earn more than non-parents, 544 thousand MNT compared to a monthly mean wage of non-parents 530 thousand MNT.

Table 1: Characteristics of the total sample (15-55 aged females, 15-60 aged males) sample by parental status

Mean	Parents	Non-Parents	Total Sample
Age	32.80	38.61	34.21
Experience (years)	11.97	20.28	13.91
Years of schooling	10.95	10.94	10.95
Wage (thousand, MNT)	544.47	530.82	541.31
Observations	26834	8585	35419
Percentage	75.76%	24.24%	100%
Percentage	Mothers	Non-Mothers	Total Women
Urban	66.04	62.39	64.90
Rural	33.96	37.61	35.10
	Fathers	Non-Fathers	Total Men
Urban	53.52	46.95	51.65
Rural	46.68	53.05	48.35
	Parents	Non-Parents	Total Sample
Urban	55.28	49.87	53.82
Rural	44.72	50.13	46.18

Source: Authors' calculations

Table 2 shows the sample size of our estimation in the total, approximately 80 percent of all women are mothers, and the remaining 20 percent are non-mothers and mothers are slightly younger (32.41 years) than non-mothers (39.10 years). As it was expected, mothers have less work experienced (9.58 years) than non-mothers (20.22 years), moreover, mothers have the less work experience from the average work experience span for parents (11.97 years in Table 1) which gives in idea that if we will identity any motherhood wage penalty then, the majority part of it can be attributed to the less work experience of mothers. About monthly earnings, mothers, on average earn less (471 thousand MNT) than non-mothers (557 thousand MNT). Mothers and non-mothers have relatively similar years of schooling.

Table 2: Characteristics of the 15-55 aged female sample

Mean	Mothers	Non-Mothers	Total Women
Age	32.41	39.10	33.76
Experience (years)	9.58	20.22	11.64
Years of schooling	11.38	11.61	11.43
Wage (thousand, MNT)	471.66	557.78	489.63
Obsenvations	14010	3528	17538
Percentage	79.88%	20.12%	100%

Source: Authors' calculations

Table 3 shows the sample size of our estimation is 17,881 men in the total, 12,824 fathers (71.7 percent) and 5,050 non-fathers (28.2 percent). We have more parents compared to non-parents in the sample. From Table 3, we can see that fathers are younger (33.2 years) than non-fathers (38.2 years). Fathers have less work experience (14.5 years) than non-fathers (20.3 years). Compared to mothers, fathers have more work experience. (See Table 2 and 3). Despite less work experience, fathers earn more on average (614 thousand MNT) than non-fathers (510 thousand MNT) which gives in idea that we will identity not fatherhood wage penalty but wage premium in the case of Mongolia.As it was in the case of mothers, fathers and non-fathers have the similar years of schooling.

Table 3: Characteristics of the 15-60 aged male sample

Mean	Fathers	Non-Fathers	Total Men
Age	33.22	38.26	34.65
Experience (years)	14.59	20.32	16.16
Years of schooling	10.47	10.48	10.47
Wage (thousand, MNT)	614.23	510.67	588.08
Obsenvations	12824	5057	17881
Percentage	71.72%	28.28%	100%

Source: Authors' calculations

The descriptive analysis results show that having children can lead to a wage premium for fathers in the labor market, while to a wage penalty for mothers. In Mongolia, the average education level of women is higher than that of men, but the opposite is true for the average wages. In other words, even though women are highly educated, they are getting paid less than men.

Figure 1 in Appendix gives information about people's occupations in dataset. In both aggregated data and sex-disaggregated data, occupations such as agriculture, trade worker, and specialists are predominant. In addition, livestock herders are engaged in agriculture, which is the largest occupation for any group. So, the majority of our sample is herders. There are issues to be considered in this regard. Herders are mainly self-employed and use a certain percentage of their household production for their own consumption. The dataset describes that herders's mean monthly income is about 223 thousand MNT (65.58 USD), for female herders it is about 211 thousand MNT (62.05 USD), for male herders 226 thousand (66.47 USD). The average, mean monthly income of herders is roughly two times less than mean monthly wages in pooled data and gender disaggregated wage data. Some descriptive statistics calculated by excluding herders from the sample will be included in Appendix in Table 1.

4.2 The Blinder- Oaxaca decomposition estimates

Before the Blinder- Oaxaca decomposition estimate, we will focus on the Mincerian equation on monthly wage for parents and non-parents. After the two distinct OLS estimations, we can calculate the wage difference between these two groups and distinguish difference by explainable and unexplainable parts. We find an evidence that more schooling increases monthly wage for all but the increase is higher for parents than for non-parents. One more year of schooling increases monthly wage for parents by 6.54 percent and 3.41 percent for non-parents and the coefficients are statistically significant at 1 percent and 10 percent level respectively. One more year older will decrease one's monthly wage compared to one year younger person by 2.18 percent. Being married is significantly increase a monthly wage for parents by 12.38 percent at 1 percent significance level. Urban residents, whether parents or non-parents, tend to being paid more than rural dwellers by 15.32 and 7.27 percent respectively. According to significance level of the estimation that its impact is more strong for parents. We controlled for the occupations taking agricultural occupations (farming, fishing, forestry) as a reference group. Compared to agricultural jobs, managers, specialists, and all other occupation holders have greater difference in their monthly wages between 19.64-70.32 percent and the coefficients are statistically significant (See Table 4).

Table 4: OLS estimations for parenthood

Variables	Parent	Non-Parent
Age	$-.0218^{***}$ (.0054)	.0119 (.0169)
Experience	$.0195^{**}$ (.0053)	-.0156 (.0169)
Years of schooling	$.0654^{***}$ (.0062)	$.0341^{*}$ (.0177)
Marital status	$.1238^{***}$ (.0253)	.0336 (.0281)
Urban/Rural	$.1532^{***}$ (.0164)	$.0727^{**}$ (.0285)
Occupation (control group = agriculture)		
Manager	$.6523^{***}$ (.0532)	$.6590^{***}$ (.0866)
Specialist	$.4475^{***}$ (.0512)	$.5413^{***}$ (.0812)
Technician	$.5244^{**}$ (.0585)	$.4497^{***}$ (.0962)
Service worker	$.3326^{***}$ (.0630)	$.4127^{***}$ (.0955)
Trade worker	$.2953^{***}$ (.0514)	$.1980^{**}$ (.0788)
Construction	$.5066^{***}$ (.0472)	$.3767^{**}$ (.0736)
Machinist	$.7032^{***}$ (.0478)	$.6309^{***}$ (.0762)
Other	$.1964^{***}$ (.0466)	$.1867^{**}$ (.0697)
Industy (control group = agriculture)		
Manufacturing & Construction	$.0910^{***}$ (.0233)	$.0861^{**}$ (.0417)
Trade & Service	$.1201^{***}$ (.0249)	$.1103^{**}$ (.0453)
Constant	12.24^{***} (.0872)	12.05^{***} (.1712)
Observations	4598	1,435
Prob = F	.0000	.0000
R square	.2991	.3278

Source: Authors' calculations. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels respectively. The number in brackets represent the standard errors of the represented variables.

Table 5 below shows the general results of the Blinder-Oaxaca decomposition for 3 different groups. First, the monthly earnings of people with children of any gender were compared to people without children. The baseline comparison group is the group without children. Thus, the total difference column in the table shows that parents earn an average of 11.93 percent more than non-parents. About 7.96 percent of the difference is observable and can be explained by the differences in age, education, experience, marital status, urban residency, occupation, and industry. But the remaining 3.97 percent is an unexplained difference which can be resulted from the labor market unobserved discrimination. Second, let's focus on the female group. In this group Oaxaca decomposition total difference results in positive coefficient. It means mothers are paid less than non-mothers.

Table 5: Oaxaca decomposition pooled result (explained part).

Group (base group: child=0)	Total Difference	Explained	Unexplained	Observations
Parent vs Non-Parent	-11.93%	-7.96%	-3.97%	6033
Mother vs Non-Mother	21.30%	12.38%	8.92%	1059
Father vs Non-Father	-19.30%	-14.01%	-5.29%	4974

Source: Authors' calculations

From Table 5, we see an average wage gap between mothers and non-mothers is 21.30 percent or motherhood has a wage penalty of 21.30 percent on the Mongolian labor market. More than half of this wage gap is explainable part (12.38 percent). The remaining 8.92 percent is an unexplained difference. Our estimation is in the same range of the wage penalty with Ukraine as it was estimated by Nizalova et al. (2016) at 19 percent. While women face a wage penalty for being mothers, men have a wage premium for being fathers. From Table 5 below, we can see that fathers earn 19.3 percent more than non-fathers or fathers in Mongolia have wage premium of 19.30 percent and the result is similar with the findings by Killewald (2013), Waldfogel (1998), Addati et al., (2018), Glauber (2018), Grimshaw and Rubery (2015), Weeden et al. (2016), Cukrowska-Torzewska and Lovász (2017), Kleven et al. (2019), and Dias et al. (2020).

Table 6: Oaxaca decomposition pooled result (explained part).

Variables	Motherhood	Fatherhood	Parenthood
Age	-.0083	-.0924	−.1735***
	(.0345)	(.0710)	(.0300)
Experience	.0248	.0690	.1711***
	(.0556)	(.0762)	(.0332)
Years of schooling	.0496***	−.0235***	-.0062
	(.0129)	(.0074)	(.0065)
Marital status	-.0027	−.0284***	−.0266***
	(.0046)	(.0095)	(.0062)
Urban/Rural	.0006	−.0108**	−.0067***
	(.0018)	(.0027)	(.0021)
Occupation (control group = agriculture)			
Manager	.0251**	−.0148**	-.0063
	(.0113)	(.0064)	(.0056)
Specialist	.0371***	−.0174***	.0028
	(.0173)	(.0059)	(.0054)
Technician	-.0041	-.0012	-.0024
	(.0039)	(.0035)	(.0030)
Service work	.0031	.0005	.0033
	(.0038)	(.0019)	(.0021)
Trade work	-.0013	.0042	.0039
	(.0041)	(.0028)	(.0026)
Construction	-.0047	.0012	-.0067
	(.0053)	(.0062)	(.0049)
Machinist	-.0007	−.0326**	−.0352***
	(.0033)	(.0095)	(.0077)
Other	.0008	.0096***	.0040*
	(.0091)	(.0034)	(.0024)
Industry (control group = agriculture)			
Manufacturing & Construction	.0007	−.0039**	-.0018
	(.0016)	(.0018)	(.0014)
Trade & Service	.0038	.0005	.0005
	(.0042)	(.0015)	(.0015)

Source: Authors' calculations. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels respectively. The number in brackets represent the standard errors of the represented variables.

The wage gap between mothers and non-mothers has a significant positive effect of one more year educational attainment, being a manager, or being a specialist. For example, 1-year marginal education has the effect of 4.96 percent at the 1 percent significance level, holding a managerial position by 2.51 percent, and being a specialist by 3.71 percent at the 5 percent significance level has the effect of increasing the wage gap between the above two groups, respectively. On the other hand, education, marital status, living in an urban area, and working as a manager, specialist or machinist have a negative effect on the difference in wages depending on whether men have children, while holding a other occupation has a positive effect on the 1 percent significance level.

In particular, the wage gap between men depending on whether they have children increases by 2.35 percent for additional one year of schooling, 2.84 percent for married,

and 1.08 percent for living in an urban area. Regarding occupation and working sector, being a male specialist decreases the wage gap by 1.74 percent, being a machinist by 3.26 percent, and being a manager by 1.48 percent, respectively. Meanwhile, working in the construction and manufacturing sector has the effect of reducing it to a 5 percent significance level.

We included control variables representing occupation and industry in our estimation. Among them, it can be seen that only white-collar workers or blue-collar workers are relevant to the evaluation of 3 different groups and have a significant differential effect. According to the pooled estimation, the parental wage gap is negatively related to age, marital status, urban residency or being a machinist and positively related to work experience. At the 1 percent significance level, a one-year increase in a person's age decreases the wage gap by 17.35 percent and being married by 2.66 percent, respectively. For parenthood, the coefficient of age is negative (-0.1735) and statistically significant at the 1 percent level, reveals that, ceteris paribus, individuals with children tend to paid less than those without children as they age. Also living in an urban area reduces the parental wage gap by 0.67 percent at the 1 percent significance level. Several occupation and industry variables show significant coefficients, suggesting that the type of job and industry also influence the wage gap between individuals with and without children. In particular, at the 1 percent significance level, being a machinist reduces the parental wage gap by 3.52 percent. There are notable interesting results emerging from the analysis. Additional year of schooling increases the motherhood wage gap, while it decreases the fatherhood wage gap. Also being a management-level employee increases the child-related wage gap between women and decreases it among men.

5 Conclusions

We have estimated the motherhood and fatherhood wage penalty in Mongolia using HSES 2018 raw data. Using the 2018 Household Socio-Economic Survey of Mongolia, and applying the Oaxaca-Binder decomposition method, our analysis reveals an overall parental wage premium of 11.93 percent. Upon our estimation, we observe a fatherhood wage premium of 19.30 percent, alongside a motherhood wage penalty of approximately 21.30 percent.

Our research findings echo and update previous literature on the topic and can be used for comparative studies with the incoming research in developing and transition economies. A first limit of our analysis is that we did not focus on the causality of the wage penalty. The second limit is that we did not focus on the changes in the wage penalty since our data is one cross section data from HSES 2018 Mongolia. Parental wage penalty can change over time, and parental leave policies may play a role in this regard. This is avenue for the future research. The findings of this study point toward a need for further investigation of the motherhood wage penalty in the Mongolian labor market via a detailed examination of the topic.

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7 Appendix

Appendix 1: Characteristics of 15-60 aged herders by parental status

Mean	Parents	Non-Parents	Total Sample
Age	36.38	41.89	37.84
Experience (years)	17.65	24.77	19.53
Years of schooling	8.14	8.37	8.20
Wage (thousand, MNT)	224.46	221.67	223.59
Observations	4221	1515	5736
Percentage	73.59%	26.41%	100%

Source: Authors' calculations

Appendix 2: Characteristics of 15-60 aged sample by parental status (herders are not included)

Mean	Parents	Non-Parents	Total Sample
Age	32.13	37.90	33.51
Experience (years)	10.85	19.20	12.75
Years of schooling	11.50	11.56	11.52
Wage (thousand, MNT)	551.95	541.88	549.64
Observations	22613	7070	29683
Percentage	76.18%	23.82%	100%

Source: Authors' calculations

Appendix 3: Characteristics of 15-55 aged female sample (herders are not included)

Mean	Mothers	Non-Mothers	Total Women
Age	31.80	38.09	33.07
Experience (years)	8.73	18.92	10.69
Years of schooling	11.83	12.05	11.87
Wage (thousand, MNT)	474.40	560.20	492.36
Observations	12169	3066	15235
Percentage	79.88%	20.12%	100%

Source: Authors' calculations

Appendix 4: Characteristics of the 15-60 aged male sample (herders are not included))

Mean	Fathers	Non-Fathers	Total Men
Age	32.51	37.76	33.96
Experience (years)	13.34	19.42	14.95
Years of schooling	11.12	11.19	11.14
Wage (thousand, MNT)	628.09	527.47	603.10
Observations	10444	4004	14448
Percentage	72.29%	27.71%	100%

Source: Authors' calculations

Appendix 5: Mean earnings by occupation

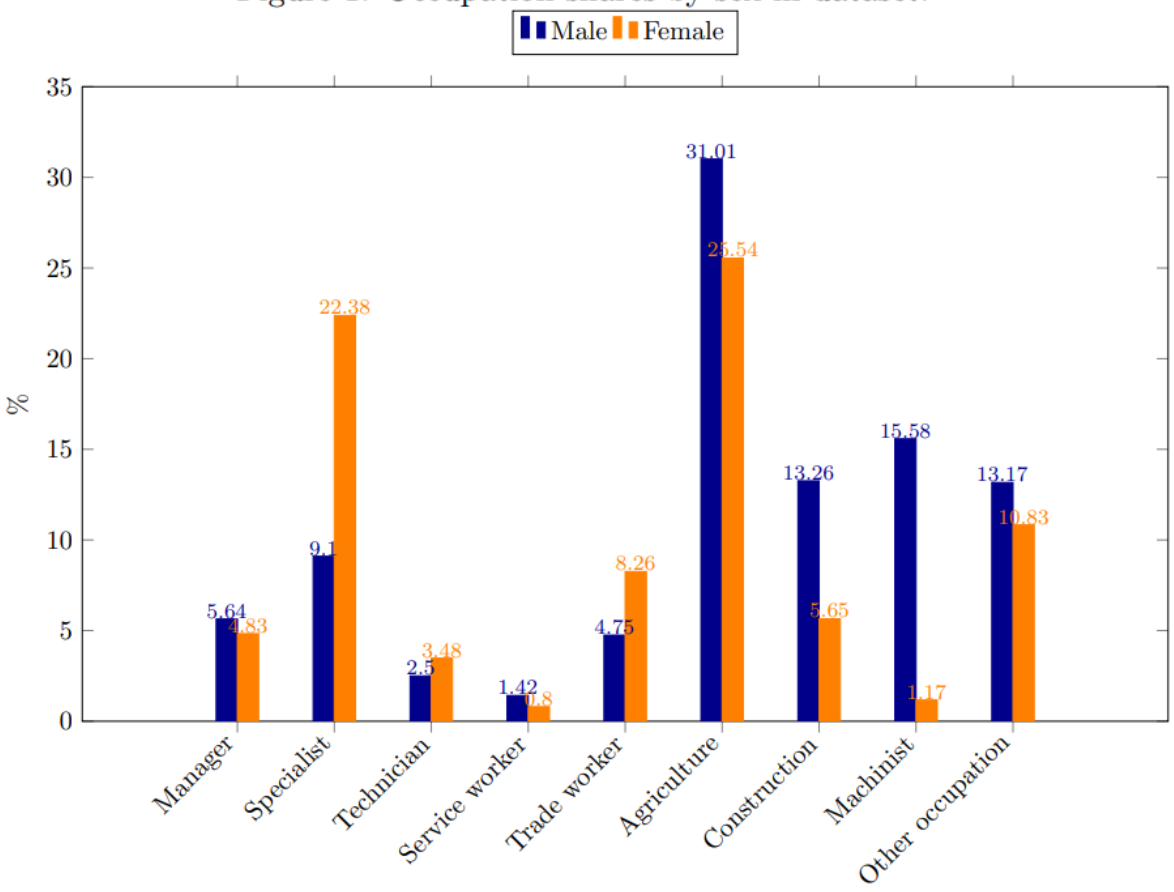
Last Month Earnings by occupation (Thousand, MNT)	Female	Male	Total
Manager	750.77	907.38	840.87
Specialist	561.74	717.31	611.45
Technician	597.10	693.51	641.55
Service worker	514.61	595.30	535.57
Trade worker	388.51	499.48	421.10
Agriculture	228.52	232.17	231.48
Construction	402.08	523.80	496.72
Machinist	658.70	742.02	736.90
Other occupation	359.51	365.79	363.12

Source: Authors' calculations

Appendix 6: Description of variables

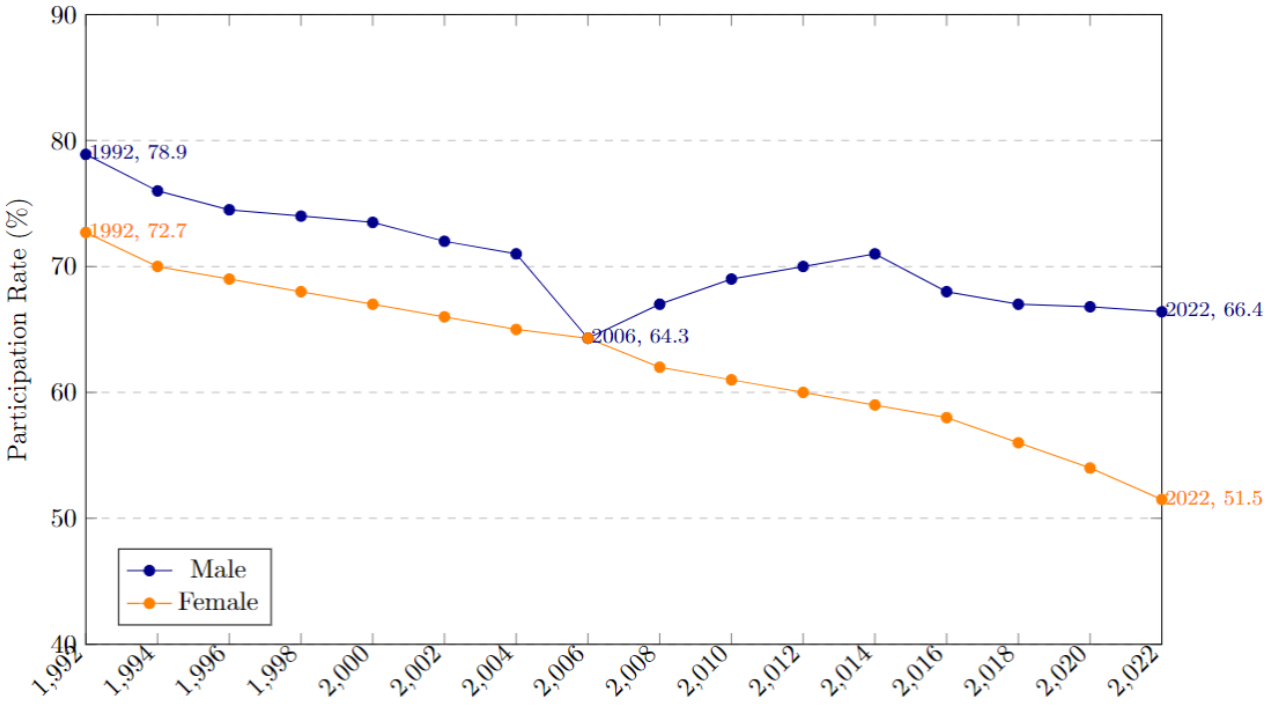
Variables	Descriptions
Monthly earning	Natural logarithmic value of monthly earning
Age	Continuous variable which shows ages by individual
Experience	Male: (age-years of schooling-8) Female: (age-years of schooling-8-2*childnumber) Here, 8 is a school starting age, 2 is career break years caused by motherhood in terms of childcare.
Years of schooling	"0" years for non-educated "4" years for primary "8.5" years for incomplete secondary "11" years for complete secondary "12" technical and vocational training "13.5" higher education "15" years for diploma, Bachelor "17" years for master degree training "21" years for Ph.D
Marital Status	Dummy variable. If an individual is married marital status equals 1 and if single that variable will take zero.
Urban/Rural	Dummy variable. If an individual lives in urban area that variable will be equal to "1". Otherwise, the value is zero.
Occupation (control group=Agriculture)	Dummy variables created by occupation code.
Industry (control group=Agriculture)	Dummy variables created by industry code.

Figure 1: Occupation shares by sex in dataset.



Source: Authors' calculations.

Figure 2: Labor force participation rate by gender



Source: NSO