

## Do Social Norms Overpower Comparative Advantage Theory?: Evidence from China and Japan

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# Do Social Norms Overpower Comparative Advantage Theory? Evidence from China and Japan

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## Abstract

This paper presents an investigation of two mechanisms of household labor supply: comparative advantage and social norms related to gender roles in China and Japan. Households make labor distribution decisions according to comparative advantage theory. Decisions based on such rational will be distorted for people who have an aversion to violating social norms when a wife earns more than her husband. Results demonstrate that Japanese women avoid the labor market when they might potentially out-earn the husband, although Chinese women exhibit less conformity to that social norm. However, husbands in both countries in the same situation will make the opposite decision. They tend to even be more engaged in the labor market than is normally the case, which presents evidence that social norms also distort husbands' labor choices. Furthermore, this paper explains that under the same situation of their wives potentially earning more, the Japanese wives tend to offer fewer working hours than Chinese wives.

*Keywords:* Comparative advantage, Household labor supply, Social norms

## 1. Introduction

Great improvements in women's social-economic status have occurred all over the world in recent decades. Reforms of educational systems, accumulation of human capital, reduction of discrimination, along with changes of contraception and labor demand have reduced gender differences in labor participation rates and income inequality. Nevertheless, even today, a substantial gender gap persists. According to the World Bank, the decrease in the gender gap has slowed, becoming stagnant over the past decade (Goldin, 2014, 2017; Blau and Kahn, 2013, 2017). The glass ceiling remains, impeding women who want to go higher. Furthermore, the willingness of highly educated women to participate in the workplace is much lower than people might expect (Goldin, 2014).

This stagnation has led scholars to start considering factors such as social norms other than

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traditional economic factors. Gender norms draw wide attention in studies of gender problems. Universal social norms which accurately apply to all countries do not exist. Even in one country, there might exist many social norms in specific periods or specific locales. Such norms are usually shaped by the culture and period (Cuddy et al., 2010). In collectivist societies, people tend to prioritize the interests of the group rather than those of an individual. Asian countries tend to be considered collectivist societies (Triandis et al., 1988). People who live in collectivist societies instinctively valued interpersonal harmony above personal preference and thus chose the unoffensive behavior even it goes against their own interests. Regarding the social norms that relate to gender, one example is that men are expected to be independent, agentic, and goal-oriented; women are expected to be interdependent, communal, and oriented toward others (Spence and Helmreich, 1979). By giving such prescriptions, people choose behavior fitting such an identity. Furthermore, that choice will influence an individual's economic outcomes such as employment, hiring, and promotion (Akerlof and Kranton, 2000; Heilman, 2001).

Social norms have an impact on people's behavior. From sociological and psychological perspectives, behavior that fulfills social norms is called conformity. Resistance against conformity will engender various costs (Akerlof and Kranton, 2000). People present such conformity for a sense of belonging to a particular social category and a sense of identity. If people's behavior deviates from social norms, then sanctions will be used, with negative effects outweighing the positive in prevailing cases. For that reason, the majority still conform to social norms. In other words, there exist penalty mechanisms throughout society that punish deviation from social norms.

Fortin (2005) provides empirical evidence of such a mechanism by investigating the effects of gender role attitudes, egalitarian attitudes, and work values on women's labor-market outcomes across 25 OECD countries. Anti-egalitarian views are found to display the strongest negative association with female labor participation rates, leading to a larger gender pay gap. According to the World Value Surveys, the question "If a woman earns more money than her husband, it's almost certain to cause problems." still has support.<sup>1)</sup> The ratio of the agreement is not high. Nevertheless, people who reported "neither agree nor disagree," "do not know," and "no answer" account for about 46.5%. They are apparently reluctant to take a clear stand on the statement, which engenders an explanation of response bias.<sup>2)</sup> Actions speak louder than words: that is the primary motivation for this study, which uses real economic outcomes instead of a ratio of value surveys.

Traditional economics provides theories about the distribution of household resources. Becker

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1) The total ratio of agreement with "If a woman earns more money than her husband, it's almost certain to cause problems" of the World Values Survey Wave 6 (2010-2014) is 14.9%. For Chinese and Japanese the numbers are 21.9% and 10.4%, respectively.

2) Respondents might give socially desirable answers to prevent opposing political correctness or avoid telling the undesirable truth. They might want to appear better than they really are (Podsakoff and Organ, 1986).

(1965) initially devised a theoretical analysis of comparative advantage within a family when allocating time. The analysis indicates that the family member with higher labor productivity should be more engaged in labor supply; the one with higher household productivity should be more engaged in home production.

Even if households make labor decisions based on comparative advantage, the labor supply choice will be distorted when considering social norms. According to comparative advantage theory, women with higher labor productivity should stay employed in the labor market. However, given social norms, some women with higher incomes might tend to opt-out of the labor market or reduce their labor supply to avoid violating the gender prescription that the breadwinner role usually belongs to the husband.

In most cases, the income level stands for authority and taking charge of family decisions. Traditionally, husbands have such authority, which will be challenged when a wife earns more. To avoid threatening a husband's authority, women might undertake more household production (Bittman, 2003), which will eventually lead women to a less satisfactory marriage and even divorce. To stabilize their marriage and reduce the threat to a husband, women with a promising career might choose to leave the labor market, reduce their labor supply hours, or transfer to a less attractive job (Bertrand et al., 2015).

Many studies have examined relations between gender attitudes in society and the female labor supply. Furthermore, not a few researchers have examined how much comparative advantage by gender in the market labor and household work would affect the gender gaps of labor supply between a husband and wife. However, few researchers have examined which mechanism dominates labor supply decisions. This study was conducted to examine two mechanisms affecting the couple's decision making. To investigate further how social norms function under different cultural backgrounds, same year cross-sectional datasets from China and Japan are used.

Unlike many western countries, Asian women especially in China and Japan have been taught to be obedient and take care of home affairs from a thousand years ago, with deeply rooted gender connotations of Confucianism. At the root of Confucianism, China's female labor participation rate is surprisingly high because of tremendous changes in gender attitudes as a result of several reforms including enforcement of marriage laws, economic reform, and education expansion.<sup>3)</sup> Women have experienced marked improvement in socioeconomic status relative to that of men. Analyzing the case of China presents beneficial implications for the effects of the change in gender roles associated with social development.

Because it has been heavily influenced by Confucianism, Japan is also recognized as a conservative

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3) In 1950, China instituted the Marriage Law, which formally legalized free-choice marriage and explicitly equalized wives' rights and interests with those of husbands. Economic reforms began in 1978.

society historically. Japanese women have had equal rights to those of men, de jure, since the end of World War II, although economic conditions for women remain unbalanced today. The “housewifization” of Japanese women is thought to have peaked in the mid-1970s. Large numbers of men were employed in urban areas during the high economic growth era. Most of the women who married became full-time housewives. However, after the 1970s, the female labor participation rate started to rise again gradually. The increase is mainly attributable to married women (MHLW<sup>4</sup>), Actual Situation of Working Women in 2012, p. 5). However, gender expectations remained. Women even now are viewed as more suited to household work and child rearing than men (Yamaguchi, 2000, 2017). In fact, the gender gap in labor participation in Japan is large. Japan placed 121<sup>st</sup> in gender equality among 153 countries in the World Economic Forum’s global gender equality rankings for 2019.<sup>5</sup>) Facing severe aging problems, however, the mode of promoting women entering the labor market has become a fundamentally important pillar of government reform programs.

Based on the situation described above, this study first examines the effect of comparative advantage to the female labor supply by assuming that the potential possibility of husbands’ earning more than the wife is negatively correlated with the wife’s labor participation. This way of thinking applies to the husband’s labor participation. If that is valid, i.e., one who earns less in a family will rationally choose to opt-out of the labor market. This study examines social norms’ effects by assuming that the possibility of earning more than the spouse has no marked effect on their own labor supply, which implies a lack of distortion by social norms. This paper describes observations of both partner’s behaviors within a family, giving a more comprehensive picture.

This paper is organized as follows. Section two presents a literature review. The third section explains the details of data and specifications. The fourth section provides empirical results for both genders in China and Japan. Finally, section five presents a conclusion.

## 2. Literature Review

### 2.1 Social norms

The study of the resource allocation within households has undergone several important developments. Becker (1965, 1991) designed a comparative advantage theory that augments Adam Smith’s concept of a division of labor by which an “efficient” household membership will specialize either in labor or household markets. This economic model developed by Becker rationalized the dominant family paradigm of the post-World War II era.

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4) The Ministry of Health, Labor and Welfare is a cabinet level ministry of the Japanese government.

5) This ranking examines four overall areas of gender inequality including Economic participation, Educational, Political empowerment, and Health in 153 economies around the globe. The U.S. ranks 53<sup>rd</sup>; China ranks 106<sup>th</sup>.

Aside from the underpinnings of economic rationality, such as comparative advantage, by which each household member makes a decision related to market and household labor to maximize household utility, another path has been explored. People normally have a sense of belonging to a social category and a sense of identity. Social norms derived from each identity and the society to which people belong require successive standards of behavior (Akerlof and Kranton, 2000). Many studies have examined how social norms influence human behavior and have clarified the mechanisms of negative sanctions that deter deviation from social norms (Güth et al., 1982; Akerlof and Kranton, 2000; Fehr and Fischbacher, 2004).

Evidence for the U.S. shows that changing social norms have affected the female labor participation rate. Fortin (2005, 2015) find definitively using United States data that gender role attitudes are related to the female labor participation rate. Bertrand et al. (2015) also present evidence that a situation in which the wife earns more than her husband, which deviates from gender identity norms, adversely affects a married woman's labor force participation. Bursztyrn et al. (2017) uses Master of Business Administration program data to show that single women avoid career-enhancing actions because these actions signal undesirable traits, such as ambition, to the marriage market.

## 2.2 Household economics in China and Japan

Traditional gender attitudes continue to prevail worldwide, especially in countries considered conservative. Greenhalgh (1985) reported that "Traditional Confucian<sup>6)</sup> China and its cultural offshoots, Japan and Korea, evolved some of the most patriarchal family systems that ever existed." Gender inequality has a rational basis. Women are expected to be submissive in many ways.

In China, after a leap of women's status spurred by several reforms, traditional gender attitudes have been mitigated (Xie, 2013). However, still, it is revealed by income inequality, positions of authority, and distribution of housework (Yu and Xie, 2011). Back to the time when China maintained a planned economy,<sup>7)</sup> "women hold up half the sky"<sup>8)</sup> pronounced by Mao Zedong<sup>9)</sup> to encourage female participation in social activities and to advocate gender equality. As a result, the female labor participation rate exceeded 90%. The female labor force accounts for almost half of the total labor force: 48% in 1988. The average female-male wage ratio is 84% (Li and Li, 2008). A

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6) Gender roles prescribed in the Three Obedience and Four Virtues became a cornerstone of the family, and thus, societal stability. It teaches as virtuous that a woman is supposed to follow a man. For years, many modern scholars have regarded Confucianism as a sexist, patriarchal ideology that has been historically damaging to women.

7) A planned economy is one in which the government controls the country's supply and demand for goods and services. Beginning in 1978, the Chinese government changed the economic system gradually towards a market economy, allowing non-state enterprises to produce and compete with state enterprises.

8) "Women hold up half the sky" is a proclamation made by Mao Zedong, the founding father of the People's Republic of China, mainly to attest that women are a resource that ought to be deployed outside of the homes into professional fields.

9) Mao Zedong, commonly known as Chairman Mao, the founding father of the People's Republic of China.

supportive social environment and high labor enthusiasm lead the female labor participation rate to a high level. However, since China's transition from a planned economy to a market economy in 1978, the female labor force participation rate has been declining (Yao and Tan, 2005; Li and Li, 2008). In a report of a study by Yao and Tan (2005), they argue further that a decline is not the result of an increase in the husband's income, but the result of the severe labor market status. The gender gap continued to increase over time (Hauser and Xie, 2005). Compared with other countries, however, China's female labor participation rate is high.<sup>10)</sup> Gustafsson and Li (2000) report that the most important source of gender inequality is education, whereas discrimination is secondary. Although women's educational attainment has gradually caught up with that of men compared with the early years after the founding of the People's Republic of China (Hannum and Xie, 1994). The explanation has been associated with industrial structural adjustment and state-owned enterprise reform, which implies that during this reform, female workers in urban areas were more likely to be unemployed (Cai and Wang, 2004). Attention also has been drawn to traditional gender attitudes that influence interactions with gender discrimination through the rising market mechanisms (Yao and Tan, 2005; Li and Li, 2008). From a sociological perspective, Bian and Zhang (2002) prove that economic reforms accelerate gender inequality by reforming the redistribution structure, which increased gender discrimination in the labor market. Li and Xie (2013) estimate women's earnings to be 70% of men's, based on data from 2010 and 2012. Additionally, Chen and Fan (2016) report that changes in family structure play a role in changes of women's labor.

Expectations of respective genders persisted in Japan, where Confucian values hold sway, because men have been expected to display loyalty to their superiors in the workplace as women were to display loyalty to their family and their male counterparts. In fact, Japan placed 101<sup>st</sup> in the World Economic Forum's global gender equality rankings for 2012, reflecting several gaps in the labor market. Arisawa (1956) offers a classical framework called Douglas-Arisawa's law for explaining married women's allocation of labor and housework by application of Douglas law (1934). It indicates that the lower a husband's income, the more probable that a married woman will enter the labor force. However, this law has proved to be incapable of explaining married women's behavior after 50 years (Kohara, 2007; Manabe, 2004). Correlation between the husband's income and the wife's labor supply decision has weakened (Kohara, 2007). However, a significant and negative correlation exists between income of a husband and the wife's labor participation rate (Dejima, 2004; Kohara, 2007). Higuchi (2001) shows that changes in a husband's income have no effect on the wife's employment decision at all, but it still has a significant and negative influence on the wife's long-term income level. Even around the millennium, in Japan, two-thirds of women agreed that "women are more suited to household work and child rearing than men are" (Yamaguchi, 2000). Furthermore, the Douglas-

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10) In 2012, China's female labor participation rate was 63%; the world average rate was 49%.

Arisawa law, holding that female employment rates fall as male incomes rise, has remained largely intact at least over the ten years of 2002-2012 (Tsutsui, 2016), even though the female employment rate has apparently shifted upward. Kawaguchi (2002) also validates the effectiveness of this law using consumer panel data from 1997. Especially for highly educated women, the proportion of being unemployed is increasing, without re-employment after work stoppage (Tsutsui, 2016).

### 2.3 Hypotheses

Based on the earlier studies described above, this article specifically examines how two mechanisms, comparative advantage and social norms, both affect the distribution of the division of household labor. The comparative advantage theory holds the view that higher potential earners in the labor market should work more, while the other member should be more engaged in household production. Therefore, we assume that the members have the same household production. Social norms related to gender roles imply that women are expected to earn less than men and that they should opt-out or reduce the labor supply to restore traditional gender roles. In an empirical analysis aimed at investigating the relation between relative incomes and the labor supply, the first task at hand is to quantify the wages of both members. However, some difficulty exists by which income and labor supply are mutually determined, which impedes empirical research. If one stays away from the labor market, then the income will become zero naturally, which renders such analyses unpractical. This paper follows Bertrand (2015) to construct the potential wage, which is able to circumvent such infeasibility.

The following two hypotheses are proposed to test two mechanisms related to the household labor supply.

- (1) If the comparative advantage theory holds, then the situation in which the wife's potential earning is higher than that of the husband will enhance the wife's labor supply and will lead to the reduction of the husband's.
- (2) If social norms related to gender roles are dominant, then a situation in which the wife's potential earning is higher than that of the husband will enhance the husband's labor supply and the reduction of the wife's, reflecting them in society.

These two hypotheses were examined respectively to validate comparative advantage theory and gender role social norms. If the household labor distribution is in line with the comparative advantage theory, then under the situation by which the wife's potential earning exceeds her husband's is expected to be negatively related to the enhancement of the husband's labor supply. However, if the distribution of household labor is strongly affected by gender role social norms, then the possibility that a wife earns more is expected to be negatively correlated with the wife's actual labor supply and is expected to be positively related to the husband's labor supply.

Both labor supply behaviors of the wife and husband will be examined herein, giving a more

comprehensive picture instead of merely particularly addressing the women's side. When a member makes labor choices, not only the self-relevant factors are examined. The labor choice made by a spouse also affects. This paper will present an examination of whether social norms and comparative advantage also influence the husband's labor choice and how he makes such choices, which enables us to avoid a one-sided study and to provide a new method of observing the female labor supply at a household level. It will be a contribution to investigate whether husbands with a high-income spouse have the same reactions as wives do.

### 3. Empirical specifications

#### 3.1 Data

To set up sample sets of analysis for comparison of China, and Japan, this study uses data from The Chinese Household Income Project collected data (CHIPS) and JHPS/KHPS dataset.

The Chinese Household Income Project (CHIPS) was collected to measure and estimate the distribution of personal income in the People's Republic of China. It is also known to constitute the most authoritative microdata in the field of China's income distribution and labor market research to date. Data were collected through a series of questionnaire-based interviews conducted in 1988, 1995, 2002, 2007, 2008, and 2013. The most recent survey data in 2013 are being used as the Chinese sample in this paper.

The JHPS/KHPS dataset is a combination of the former "Japan Household Panel Survey" (JHPS) and the "Keio Household Panel Survey" (KHPS). To respond to individual-level data demands, the KHPS has been conducted since 2004, and the JHPS since 2009, with comprehensive topics such as individual attributes, academic background, employment behavior, and various household characteristics. The survey is regarded as yielding pioneering individual panel data in Japan in terms of both quality and quantity. For this study, sample sets are restricted to married couples with both aged 25-65 in all three countries. The yearly income for the prior calendar year is used as the proxy variable of wage level reported by the respondents.

#### 3.2 Descriptive statistics

Table 1 reports the summary statistics of the main variables from samples collected in 2012. Overall, husbands tend to participate in the labor market and work longer, especially in the case of Japan; The probability of a wife's income surpassing that of her husband was only 18% in Japan and 23% in China. The ratio of couples where a husband earns more is about five times as the wife's probability in Japan and about three times in China, which underscores the weak position of women in the labor market.

Table 1: Descriptive statistics

Variable	China		Japan	
	Wife	Husband	Wife	Husband
Age	44.10	45.72	47.66	49.80
Years of schooling	8.69	9.63	13.43	14.04
Income per year	4,092	5,349	21,368	68,308
Work hours per week	43.35	43.87	44.92	50.51
Labor participation rate (%)	70.23	88.49	64.17	91.27
Difference of income (%)	30.52		68.31	
Number of children	1.32		1.68	
Observation	13,190		3,413	

Notes: Data referred to the 2012 CHIPS and JHPS/KHPS. The sample retains married couples aged 25-65. Difference of Income = (average income of husband - average income of wife) / average income of wife. (homemaker is not included.)

### 3.3 McCrary test

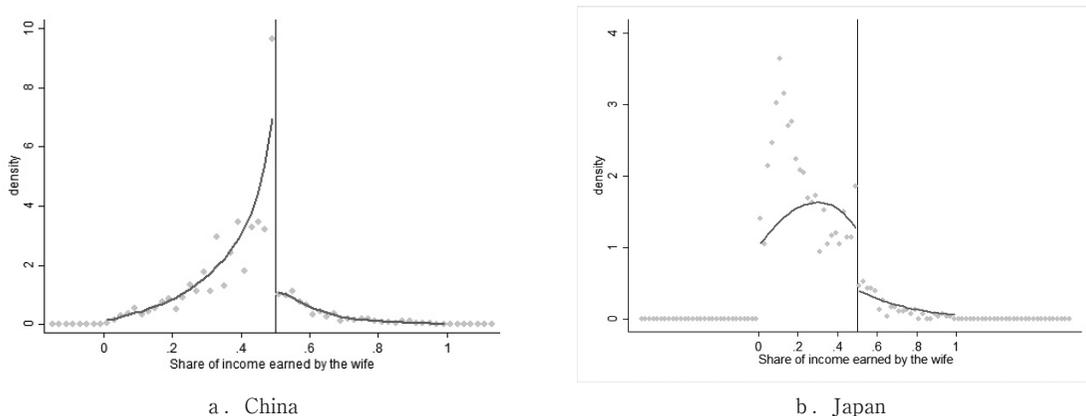
For the distribution of these shares, this study first applies the McCrary test to examine if a discontinuous drop is observed at the point where the wife earns more. This test examines the degree of the difference of probability densities in the back and forth of the cut-off. Based on Figure 1, many couples receive equal earnings, and setting the cut-off point at 0.5 will be inappropriate. Therefore, we use 0.501 as the cut-off point instead of 0.500.

The results are presented in Figure 1. Results demonstrate the existence of a discontinuous decrease in the distribution of the wife's share of household labor earnings at the cut-off, which is consistent with the social norm that a man should earn more than his wife.

Theoretically speaking, if both members of a household do not agree that "a man should make more money than his wife," then the distribution of relative income is expected to be distributed continuously. Even if the women's average income is lower than that of men, the distribution of relative income will be left-shifted rather than dropping. The emergence of drops among the two countries might reflect gender role social norms that the husband should earn more than the wife.

Looking at the cut-off point 0.501 of figure a, where a wife starts earning more than her husband in China, the share of the wife's income reaches a peak immediately before the cut-off and drops suddenly immediately after that. While in Figure b we can find an inverse U before the cut-off, which due to Japan's well-developed part-time employment system. Both exhibit the sharp discontinuous drop in the distribution of relative income. It reveals that couples try to avoid circumstances under which the wife would earn more than her husband, as social norms related to gender roles indicate.

Figure 1: McCrary tests for discontinuity in women's shares of household earnings in China and Japan, 2012.



Note: Each dot represents the fraction of couples in a 0.05 relative income bin. The vertical line represents the relative income share=0.501.

### 3.4 Specification

The difficulty in empirical research into the household labor supply lies in endogeneity, which here refers to income and labor supply as mutually causal and mutually determined. Based on this consideration, this paper follows Bertrand (2015) to construct the potential wage instead of using the actual wage. In doing so, observing the labor supply choice of women with higher potential income becomes more possible.

Bertrand first redefines samples to those couples in which the husband is currently working. However, by dropping the samples in which the husband is away from the labor market, we might lose the opportunity to observe the only wife-working pattern family. Consequently, samples in which the husband is not working are retained in this paper, which enables us to analyze both members' performances<sup>11)</sup> within a family.

The present study is to classify samples using the same demographic characteristics in the same group. Then we can calculate the percentile wage of each group based on non-zero wages<sup>12)</sup> from wives who are currently in the labor market in each group. In doing so, the potential income distribution of the same demographic group becomes obtainable.

This paper selected three demographic characteristics to calculate the potential income: age, education, and region. Age has four categories: 25-35, 35-45, 45-55, and 55-65. The education level

11) Bertrand (2015) extracts a sample in which the husband has positive income, which enables analysis just for wives' labor supply. This study retains such samples where the husband wage is 0, and accordingly constructs the husband's potential wage, which provides a channel to observe wives and husbands.

12) Non-zero wage indicated the truly existing wage of the wives who in the labor market; if one stays away from the labor market, then his/her wage will be zero naturally.

has three categories: below high school, high school, and higher education, which includes the bachelor, master, and doctor degrees. Household regions are reported in province, state, and city scales.<sup>13)</sup> To set up a unified demographic standard and ensure the sample size for each group,<sup>14)</sup> the sample sets are restricted to the large majority of ethnicity and race. The Chinese sample set only retains Han ethnicity, the vast majority, constituting about 92% of its population. As a result, the numbers of categories are 108 in China, and 48 in Japan. For each category, the wage distribution percentiles can be calculated.

First, for a couple  $i$ , we estimate the distribution of the wife's potential wage,  $\omega_i^{wP}$ , which is the  $P^{th}$  percentile of wages among the working wife in the same demographic group. Then, comparing  $\omega_i^{wP}$  with the income of her spouse,  $Income_{s_i}$ ,<sup>15)</sup> the variables showing the possibility of constructed  $\omega_i^{wP}$  exceeding the husband's,  $PrWifeEarnsMore_i$ , is obtainable.  $PrWifeEarnsMore_i$  is defined as,

$$PrWifeEarnsMore_i = \frac{1}{19} \sum_P 1 \quad \text{if } \omega_i^{wP} > Income_{h_i}$$

The distribution is based on every fifth percentile (5, 10, 15, ..., 95). Therefore,  $PrWifeEarnsMore_i$  is calculated based on 19 percentiles<sup>16)</sup>.

Again, the advantage of using such a method is that even if the wife is not in the labor market, the possibility of her earning more than the husband is still available, which sheds light on observing women's labor supply choices when their income might exceed that of their spouse.

The regression models are set as shown below.

$$Y_i^w = \alpha_0 + \alpha_1 PrWifeEarnsMore_i + \omega_i^{wP} + \alpha_2 Income_{h_i} + \mathbf{X}_i^w \boldsymbol{\beta} + \varepsilon_i \quad (1)$$

$$Y_i^h = \alpha_0 + \alpha_1 PrWifeEarnsMore_i + \omega_i^{hP} + \alpha_2 Income_{w_i} + \mathbf{X}_i^h \boldsymbol{\beta} + \varepsilon_i \quad (2)$$

Explanatory variable  $Y_i$  shows the labor supply (working=1, non-working=0) and work hours (per week), superscript  $w$  and  $h$  respectively denote the wife and the husband.  $PrWifeEarnsMore_i$  represents the possibility of a wife earning more than her husband.  $\omega_i^{wP}$  and  $\omega_i^{hP}$  respectively denote the constructed median potential wage for both the wife and husband.  $Income_{w_i}$  and  $Income_{h_i}$  respectively signify the ln of both members' incomes.  $\mathbf{X}_i$  is the vector of demographic characteristics, which includes the age, education level, and the number of children<sup>17)</sup>, and region. Furthermore, the superscript of  $X_i$  denotes a wife or husband.

13) In the sample of China, the region being reported is the province. In the case of the U.S., reporting units are zip codes. For Japan, the city scale, consists of four categories: Large cities; Cities with population of 200,000 or more; Cities with population of less than 200,000; and Town/villages.

14) Additional demographic characteristics will increase the number of groups. Also, the sample size in each group will decrease accordingly, which might lead to an unreliable distribution of the potential income.

15) For couples in which the husband is not working,  $Income_{s_i}$  is the husband's potential wage constructed similarly.

16) We also define husband in the same way as wife.

17) The number of children affects the possibility that the income exceeds that of the spouse (Blau and Robins, 1988)

## 4. Results

### 4.1 Relative income and household labor participation

The empirical analysis explores two mechanisms to both the wife and husband from two perspectives: the impacts on labor participation and working hours are presented respectively in Table 2 and Table 3. Column 1 and 2 corresponds to equation (1) and (2). Table 2 presents OLS estimation results for both members' labor participation in households.

From the perspective of the social norms, the members within households show conformity to traditional gender attitudes, which indicates that the husband is the breadwinner who goes out working, although the wife ought to engage in household production when making their resource allocation decisions.

Regarding the effects on the wife's labor supply, as revealed in column 1, the estimated coefficients of  $PrWifeEarnsMore_i$  varied. In China, it has little (not significant) to no effect. However, it is negative and statistically significant in Japan. When the possibility of wife over-earning her husband increased by 10%, the chance of Japanese wives choosing to opt-out of the labor market increased by 6.15%. This supports the hypothesis (2) on gender role social norms that the wife with higher potential income tends to opt-out of the labor market.

However, interestingly, regarding the relations between the husband's labor supply and  $PrWifeEarnsMore_i$ , both indicate a significant and positive correlation as column 2 shows, which conflict against the rational behavior of comparative advantage theory. The coefficients of  $PrWifeEarnsMore_i$  on the husband's labor supply are 0.114 in China, and 0.226 in Japan, which are all significant at the 1% level. That result indicates that, in both countries, when a wife has higher productivity, a husband tends to choose to stay at the labor market, protecting the "bread-winner" role, especially for Japanese husbands. This tendency also supports the hypothesis (2) on gender role social norms and partly contradicts hypothesis (1) for comparative advantage theory.

Moreover, When the husband's income increases by 10%, the likelihood of Japanese wives leaving the labor market will increase by 2.2%, while this number reduced to 0.35% in the case of China.

### 4.2 Relative income and household working hours

Even if a wife remains in the labor market when her potential income is higher than that of her husband, she might tend to reduce her working hours under the gender role social norms. The study examines the effects of relative income between a wife and husband on the working hours of wife within households. The explained variable is the working hours per week for both spouses in the econometric model. The results are presented in Table 3.

As shown in the first column in China, no significant correlation was found between the possibility

Table 2: Relative income and household labor participation

Variables	China		Japan	
	Wife's Labor Supply	Husband's Labor Supply	Wife's Labor Supply	Husband's Labor Supply
<i>PrWifeEarnsMorei</i>	-0.035 (0.034)	0.114*** (0.009)	-0.615*** (0.146)	0.226*** (0.046)
<i>log of Income_Wife</i>		0.0183*** (0.003)		-0.002 (0.007)
<i>log of Income_Husband</i>	-0.035*** (0.014)		-0.220*** (0.034)	
<i>Income &amp; Non-income Controls</i>	Yes	Yes	Yes	Yes
<i>Observations</i>	9,823	6,062	2,316	1,677

Notes: Non-income Controls are demographic characteristic controls that include the age group, education level, and resident area. Wife's potential income at each of the vigintiles is the income controls. Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 3: Relative income and household working hours

Variables	Wife's Work Hours	
	China	Japan
<i>PrWifeEarnsMorei</i>	0.101 (0.159)	-12.28* (6.955)
<i>log of Income_Husband</i>	0.0320 (0.066)	-5.134*** (1.601)
<i>Income &amp; Non-income Controls</i>	Yes	Yes
<i>Observations</i>	5,730	1,515

Notes: Non-income Controls are demographic characteristics controls that include the age group, education level, and resident area. Wife's potential income at each of the vigintiles is the income controls. Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

that a wife earns more and her working hours. This result does not support the hypothesis (1) very much. However, in the case of Japan, these two variables are significantly negatively correlated, when the possibility of a wife earning more increases by 10%, the wife's weekly working hours are reduced by 1.28.

When the husband's earning increases by 10%, Chinese wives tend to hold their working hours still while Japanese wives tend to reduce 0.513 working hours weekly for their husbands contributing more. Japanese well-developed part-time employment system might explain the difference.

## Conclusions

Factors such as social norms have been attracting great attention because traditional economic theory cannot fully account for the gender gap in past decades. Some new research demonstrates that people tend to present conformity for social norms out of a sense of belonging to a specific identity. This paper contributes to the analysis of traditional gender norms and household labor supply by examination of the real labor supply decision made by households, which authentically assesses their attitudes about a prevailing gender norm that “If a woman earns more money than her husband, it’s almost certain to cause problems.” More specifically, both members’ labor supply choices have been investigated instead of just particularly addressing the side of the women. Results provide new ideas for explaining gender differences in the labor market.

First, giving the social norms that “If a woman earns more money than her husband, it’s almost certain to cause problems”, Japanese women tend to opt-out of the labor market when they potentially over-earning their husband while Chinese women exhibit less conformity to that social norm. Secondly, having a potentially higher-earning wife, husbands in China and Japan all tend to stay at the labor market. Their intentions of working are even stronger when their wife has a greater probability of earning more. Perhaps they are trying to maintain the breadwinner role given the traditional social norms that a man should be the breadwinner. It presents evidence that social norms also distort husbands’ labor choices. Furthermore, Japanese husbands will be more engaged in the labor market more than Chinese husbands when their wives’ income potentially exceeds their own. For the labor hours, the Japanese wife tends to reduce their working hours by 1.28 per week as the possibility of her earning more than her husband increases by 10%. Chinese wives tend to hold their working hours still regardless.

In conclusion, this investigation has found that social norms do not play a leading role in wives’ labor supply choice in the case of China while the opposite of the case of Japan. The husbands’ labor participation decision is also affected by the social norms in both countries. When it comes to reducing gender inequality, this estimation results suggest the necessity of updating traditional gender attitudes so that wives are no more concerning about earning more. What is also important is that husbands are no more concerning about earning less. It will be less effective in reducing gender inequality if women are merely encouraged to be “Alpha” but men are not allowed to be “Beta”.

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