A Cross-National Analysis of the Gender Pay Gap:

National Perceptions and Contradictory Effects on Women's Status

Undergraduate Research Thesis

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by

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Abstract

This project analyzed and predicted the economic inequality problem of women with respect to sociological context among four different OECD countries by comparing men's wage and women's wages in terms of their education level, cultural background, and social relation. The index data from the International Social Survey Program (ISSP) was used to analyze the gender pay gap among four typical OECD countries. I used the Ordinary Least Square method to examine what factors have contributed to their wage gaps. First, quantitative approaches to the gender wage gap on the general population and in higher education, showed that higher education mostly lessens the gender pay gap. However, those closing gaps differ by countries, and this research analyzed four states with its perception of success factors, marriage, and professional occupations. It gives an intuitive understanding of the general trend in the gender pay gap among OECD countries and how it relates to their perceptions.

Keywords: gender pay gap, cultural backgrounds, higher education, marriage, professional occupations

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1. Introduction

While women take increasingly more part in the society as a strong work force in recent decades, they are not still treated properly in terms of payment. After the end of World War II in the United States, the labor force participation rates in women have risen sharply over the five decades, followed by growing participation rates of married women (Blau et al., 2017). Industrialization demanded more productivity and consequently more work force, and so unlike the time when women stayed home, raising children and doing house work, women's participation in production has become a necessity. But women get paid less than men still, even when they do the same kind and the same amount of work that men do.

According to Pew Research Center (2019), women's wages are less than comparable men's. For instance, from the 2018 statistics in United States, women's median hourly wage is only 85% of men's for both full time and part time workers. Additionally, when we look at full-time and year-round workers in general, still women earn even less, about 80% of what men earn. Such a gender pay gap is a real and persistent problem worldwide, causing economic hardships for women and their families all over the world. Therefore, the gender wage gap has been studied by many researches, but it still remains an important social issue that requires some new perspectives when addressing it and finding some remedy for it.

In their work, Marx and Engels (1848), for example, proposed the labor theory of value in which the economic value of goods and services is determined by the collective labor force. Provided that labor is available as a standardized parameter of economic valuing, equal pay for equal jobs should be guaranteed, but this is not universally true in real labor markets. On average, women are paid less than men in the United States. The ratio of women's to men's pay varies cross-nationally, however, and in many countries women's pay

is even lower than the women's in the United States. McDaniel (2010) showed a country where has comparable high women's participation rate in the labor market has more women's completion of a university degree while men's oddly decreased. Moreover, when a country has a higher percentage in the industrial sector decreased both men's and women's university completion but a greater impact on women. Evertsson et al. (2009) also noted as education levels go up, Netherlands, Sweden, and the United States experienced more gender equality in labor force participation, working hours, occupation segregation, and housework with minor exceptions. While the education factor revealed trivial concerning the gender wage gap, women's wage is still an important index of gender equality. Furthermore, the gender wage gap is most severe among highly educated levels due to men return to education is more than women in those nations.

Still, many people tend to think gender inequality including the issue of the gender pay gap is an ongoing problem. Women still have to deal with the "glass ceiling," where they have to struggle to reach the highest positions in organizations. Research shows that some female-dominated fields such as nursing and education, men are more likely to be promoted over their women colleagues, even though it logically makes sense that women should be able to be promoted in female-dominated professions (Williams 1992). Arulampalam et. al. (2007) found that the gender pay gap differed significantly across the public and the private sector on wages distribution for each of the EU countries. The wage gap is bigger at the top and bottom of the wage distribution. Yet the glass ceilings were more prevalent than sticky floors. For example, South Kora ranks far behind in *The Economist'*s annual Glass Ceiling Index. (2019). It remarks environments for women among the pay gap at 35 percent while the OECD average pay gap is 13.5 percent. The glass ceiling extends to leadership and corporate boards. Only 10.7 percent of women are in the senior or managerial position, and 2 percent of South Korean firms' corporate boards of directors are female. This research designed to show

how gender inequality manifested in the gender pay gap could be explained under such circumstances.

The issue of the gender pay gap is highly intersected with other issues such as cultural beliefs, class, religion, women's social status, and women's labor market status. I came to realize that I should begin to look at it from my own personal experience, because the personal is the political. I was born in 1996 in Korea. In my generation, women and men were believed to be equal, and indeed they grew up under the same education system with no apparent discrimination. It is universally accepted that we are living in an age of sexual equality and human rights. As such, the beginning of gender pay gap depart from the awareness. Jenson (2015) emphasized directions of policy discourse yield reinforce gendered socio-economic inequalities. According to the article, it is imperative to distinguish a policy goal of "gender awareness," which identifies a major change that has occurred in the last two decades in the universe of political discourse.

The gender wage gap is worldwide, damaging and tenacious. The average gender pay gap in 2019 in OECD countries is 13.4%, while the largest gap is 34.1% in Korea and the minimum is 3.7% in Belgium (OECD 2019). Regarding these statistics, Stangarone (2019) warned that the gender wage gap in Korea, which showed the highest one, would be particularly dangerous with a possibility of heightening a social tension increasing possible poverty among women in the future. A report made by the American Association of University Women (AAUW 2019) also points out that the gender pay gap is seriously threatening to the public safety net which partially depends on the equal distribution of wealth. The Institute for Women's Policy Research (IWPR 2019) predicted that the gender wage gap would be resolved by 2055 between white men and the white women, and by 2224 between white men and the Hispanic women. Black women will have to wait until 2130 for equal pay. The gender wage gap is a problem existing across the lines of race and

nationality.

It is well known that wages are linked to education level. However, its increase is not equally applied to men and women. In order to analyze the complicated process of how the gender wage gap has been created, we need to look into the relationship between the gender wage gap and women's education. Women's education has grown remarkably. Duffin (2019) reports that in the United States women's college graduation rate has already surpassed that of men, with 35.3 percent of women completing four years or more of college in 2014. Higher education in the U.S. is often considered as a way to earn a higher income and promote social mobility in the future, because the level of postsecondary education can often have an impact on employment and earnings later in their life. It is a logical corollary that women should earn more than men in general since their education level is higher than men's. However unfortunately, reality is not so. When we look at the wages of the highly educated group of women and that of men, wage gap is glaringly true. But this report did not tell exactly what caused inequity in gender wage gap.

2. Gender Pay Gap in Higher Education

The United States enacted the Equal Pay Act in 1963. It aimed to narrow the wage disparity in similar occupations which is often widened by sexual discrimination. Not only the impact of such policy, including the Equal Pay Act but also involving minimum wages or union-negotiated wage floors, the increase of educational achievement in women contributed to narrow the gender wage gap. Blau et al. (2017) noted both the reversal of the educational gender gap and the thinner gender gap in experience drawn the diminished role of human capital factors with regards to the gender wage gap over time. However, men tend to work in higher-paid occupations and industries compared to females, and the gender occupational proportion also accounts for the explanation of still existing gender pay gap. While the wage

gap is supposed to be dealt with through such kinds of efforts globally as well, the gender pay gap in similar occupations is not dealt with enough especially among college graduates. So the gender pay gap continues to exist now, and it is almost universal because it is embedded in almost all societies' structure. Some research has tried to explain about the gender pay gap that is structurally embedded in the industrialized countries, especially in the OECD member countries.

As mentioned in the introduction of this paper, OECD (2019) showed that the recent gender pay gap among countries with the lowest and the highest difference is more than 80%. This phenomenon will be a major obstacle to the future economy of mankind and must be an important social problem that has to be overcome. Many researchers have diagnosed and discussed about it, but it is still not clearly proven why gender pay gap has not been improved.

$$Gender\ Pay\ Gap(\%) = \frac{Mean\ Earnings\ of\ Male - Mean\ Earnings\ of\ Female}{Mean\ Earnings\ of\ Male} \times 100 \quad (1)$$

Table 1. Gender Earnings Gap in Seven Countries for Full-time Workers and for Highly Educated Full-Time Workers, 2009

Country	Full-Time Workers Gender Pay Gap (%)	Higher Educated Workers Gender Pay Gap (%)
Korea	34.41	30.34
Japan	46.82	42.27
United States	24.74	23.31
Germany	27.51	26.94
Australia	17.64	19.24
Sweden	16.36	22.78
New Zealand	16.78	20.11

Note: The criterion for the selected seven countries derived from the gender wage gap of OECD data in 2009 refers to full-time employees and to self-employed. The OECD data employed the median earnings, whereas the table utilized average earnings. Korea and Japan are from the upper two, respectively 38.6 and 28.3. The average of entire OECD countries was 14.8; U.S., Germany, and Australia are in middle-high rank, averaging 19.8, 16.5, and 16.4. Sweden and New Zealand represent the lower two, each averaging 9.5 and 8.8.

Table used the 2009 International Social Survey Programme (ISSP) for using data on full-time workers ages 16 to 64. Higher Education categorized those who completed the college-level degree or above.

This study utilized the data drawn from the ISSP which contains 41 countries. Firstly, the samples are taken from the OECD countries which established a certain degree of economic development. Based on the member countries, seven countries in total have been chosen. Korea and Japan are selected from the high Gender Pay Gap group while the US from the upper middle, the average from Germany, and the lower from Australia, Sweden, and New Zealand.
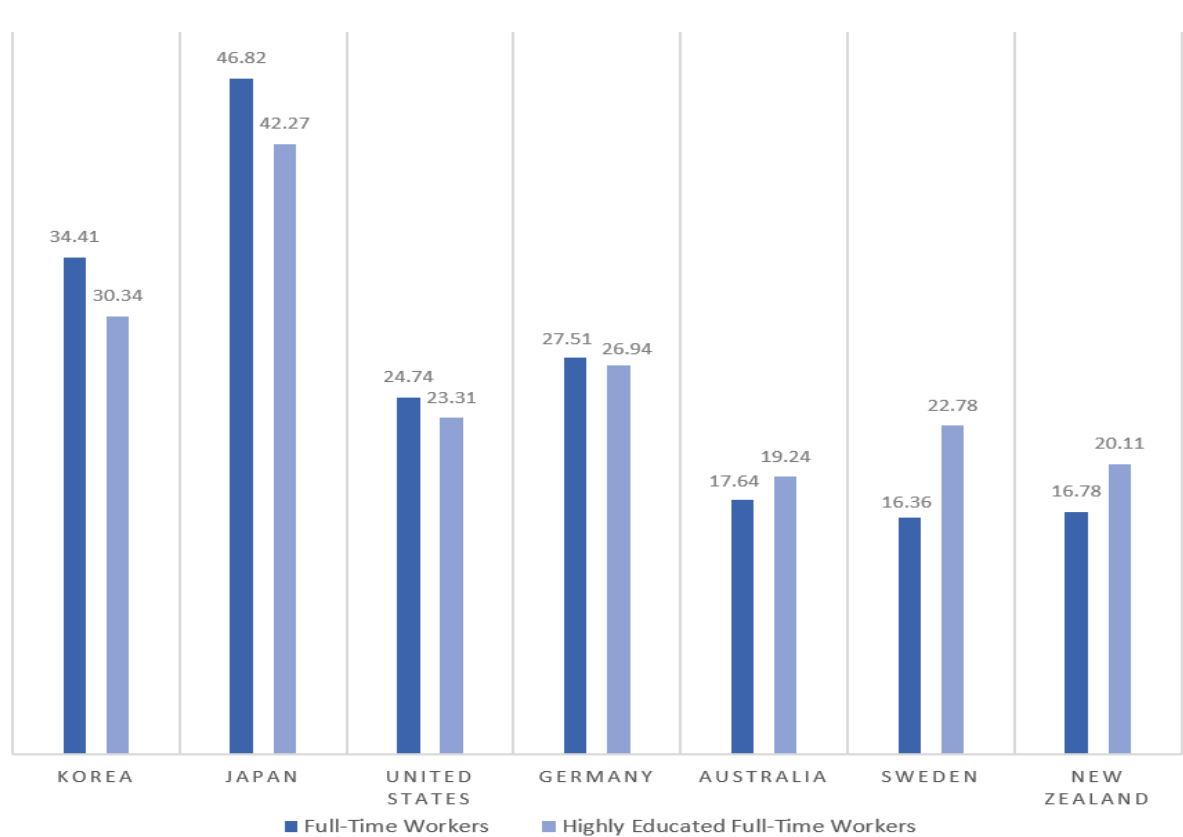
Figure 1. The Gender Earnings Gap for Full-Time Workers in Seven Countries, 2009

Note: Data source is as in Table 1. Sample consists of all persons aged 16 to 64 who reported working full-time.

As shown in **Figure 1**, the average of full-time worker's gender pay gap among

seven countries is 25.67%. Based on this average, the final samples have been selected to the following four countries: Korea and Japan to represent the worst gap for full time workers, the U.S. for the middle gap, and New Zealand for the lowest gap. Furthermore, Japan, the U.S., Sweden, and New Zealand showed more notable gaps among highly educated group of women. These countries are further analyzed statistically using OLS method from a new perspective that takes into account eleven areas of perception regarding success. Moreover, they are also examined with factors such as gender, marriage, married men, higher education achievement, and professional occupations.

3. Data Analysis and Discussion

In this section, the four countries are analyzed and discussed to understand the gender pay gap cross-nationally on the added dimension of cultural background.

3.1 Korea

Korea has the second-largest Gender Earnings Ratio (GER). Korea's GER in 2009 for full-time workers is 34.41 percent, and 30.34 percent for the population who received higher education. Table 2 is the questionnaire including 11 items about what qualities people in Korea regard as important for success. This study utilized the 2009 data from the International Social Survey Programme (ISSP) to find the correlation between gender and wages. After controlling it for our selected variables and taking into account variables of influence, the active sample is made up of 729 observations.

Table 2: Perceptions of importance in Korea, 729 Respondents

Rank	Group	Important (%)	Not Important (%)
1	Hard working	98.49	1.51
2	Social network	97.26	2.74
3	Ambition	94.79	5.21
4	Education yourself	89.44	10.56
5	Wealthy family	82.17	17.83
6	Well-educated parents	78.05	21.95
7	Political connections	58.57	41.43

8	Gender	38.13	61.87
9	Bribes	32.78	67.22
10	Race	29.63	70.37
11	Religion	28.26	71.74

Note: Data source is from ISSP in 2009. The table outlines the rank of importance in 11 groups, which represents how people think those perceptions are important to getting ahead in life. The questionnaire in "Essential," "Very important," and "Fairly important" have been sorted into "Important." Also, the response for "Not very important" and "Not important at all," have been categorized as "Not Important." Individuals who chose not to respond to pertinent questions have been excluded from the statistics.

To investigate which characteristic affects the gender pay gap, I have made the regression **Table 3** that explains how those perceptions correlate with earnings for survey participants.

Table 3. Regression of Perceptions with real wage in Korea

	Log(wage) Coeff./Std. err.
How important is it to work hard?	-0.17
	(0.21)
How important is it to know the right people?	0.32*
	(0.15)
How important is it to have ambition?	0.24*
	(0.11)
How important is it for you to have a good education ?	0.14
	(0.09)
How important is it to come from a wealthy family?	0.04
	(0.07)
How important is it to have well-educated parents?	-0.07
	(0.07)
How important is it to have political connections?	0.01
	(0.06)
How important is it to be born a man or a woman?	0.02
	(0.06)
How important is it to give bribes?	-0.00
	(0.06)
How relevant is a person's race?	-0.00
	(0.06)
How relevant is a person's religion?	-0.17**
	(0.06)
Constant	14.17***

	(0.27)
R-squared	0.0293
Adjusted R-squared	0.0144
N. of cases	729.0000
F-statistic	1.9681

$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Note: Data source is as in Table 2.

Table 3 shows having ambition and knowing the right people are significant at the .05 level. Religion is also an important factor at the .01 level. Therefore, I have picked religion factor for the following summary statistics (**Table 4**) and regression model (**Table 5**), as it appears most important among 11 perceptions.

Table 4: Summary Statistics to Show Appropriate Data in Korea

Variable	Count	Mean	SD	Min	Max
Log(wage)	739	14.61	0.68	9.21	16.81
How important is a person's religion?	739	0.28	0.45	0.00	1.00
Male	739	0.64	0.48	0.00	1.00
Married	739	0.74	0.44	0.00	1.00
Male × Married	739	0.49	0.50	0.00	1.00
Higher Education	739	0.54	0.50	0.00	1.00

Note: Data source is from 2009 ISSP. The interaction term (Male×Married) have been made to measure the differential effect of marriage on log wages between males and females. Table 4 carried one perception from Table 3, which was most significant in the regression model. The sample size has counted to 739 in consideration of excluding the individual who refused to answer pertinent questions. The table only contained full-time workers, and people who earn zero income have been excluded.

Professional Jobs categorize who is working in the professional jobs field, and the other respondents define as managerial jobs. Professional Jobs include Professional and technical, Higher administrative, Clerical, Farm proprietor, and farm manager. The others, Managerial Jobs, involves Sales, Service, Skilled worker, Semi-skilled worker, Unskilled Worker, and Farmworker. Although the data for Professional Jobs in Korea existed, there were no respondents who chose their occupation as professional and technical. Therefore, the

regression table excluded the variable of Professional Jobs here. The gender proportion in

occupation and industry was considered as important to explain the gender pay gap.

Table 5. Results for Predicting Wages for Full Time Workers in Korea

	(1) Log(wage) Coeff./Std. err.	(2) Log(wage) Coeff./Std. err.	(3) Log(wage) Coeff./Std. err.	(4) Log(wage) Coeff./Std. err.
How important is a person's religion?	-0.16**			-0.11*
	(0.06)			(0.05)
Male		0.49***	0.50***	0.45***
		(0.09)	(0.05)	(0.08)
Married		0.32***		0.34***
		(0.08)		(0.08)
Male × Married		0.00		0.01
		(0.11)		(0.10)
Higher Education			0.39***	0.40***
			(0.04)	(0.04)
Constant	14.66***	14.06***	14.08***	13.88***
	(0.03)	(0.07)	(0.04)	(0.07)
R-squared	0.0110	0.1792	0.2182	0.2729
Adjusted R-squared	0.0097	0.1759	0.2161	0.2679
N. of cases	739.0000	739.0000	739.0000	739.0000
F-statistic	8.2335	53.5069	102.6960	55.0120

$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Note: Data source is as in Table 4.

The full model, Model 4, occupies the last column of the regression table. 27 percent

of the variation in income can be explained by variation in perceived importance of religion,

gender, marriage, married male, and higher education ($r^2 = .27$). In order to understand

further the results of the regression, joint hypothesis tests are necessary. By performing a joint

hypothesis test on the results of above regression, it can determine whether certain variables

are important to consider in conjunction. First, this regression table carefully examined

whether the effects of gender and higher education were jointly significant in this regression.

The reasoning for this is all factors in Model 3 are statistically significant (p< .1). The

unrestricted model for this F-test is Model 4 and the restricted model would be Model 3.

H_0 : $Male = 0$ and $Higher$ $Education = 0$

H_A : $Male \neq 0$ or $Higher$ $Education \neq 0$

$$F = \frac{\frac{R_u^2 - R_r^2}{q}}{\frac{1 - R_u^2}{n - k_u - 1}} = \frac{\frac{0.2729 - 0.2182}{2}}{\frac{1 - 0.2729}{739 - 5 - 1}} \approx 27.2$$

This F-value above is certainly larger than the F-statistic, which is F (2, 733) =

2.9957, p<0.05), so I find evidence to reject the null hypothesis.

3.2 Japan

Table 6: Perceptions of importance in Japan, 182 Respondents

Rank	Group	Important (%)	Not Important (%)
1	Hard working	96.15	3.85
2	Ambition	86.26	13.74
3	Education yourself	84.07	15.93
4	Well-educated parents	61.54	38.46
5	Social network	53.85	46.15
6	Wealthy family	52.75	47.25
7	Political connections	42.31	57.69
8	Gender	19.23	80.77
9	Race	15.93	84.07
10	Bribes	12.09	87.91
11	Religion	7.14	92.86

Note: Data description the same as Table 2.

Table 7. Regression of Perceptions with real wage in Japan

	Log(wage) Coeff./Std. err.
How important is it to work hard?	-0.24
	(0.31)
How important is it to have ambition?	-0.14
	(0.17)
How important is it for you to have a good education?	0.19
	(0.17)
How important is it to have well-educated parents?	0.15
	(0.14)

How important is it to know the right people?	-0.08
	(0.16)
How important is it to come from a wealthy family?	-0.09
	(0.14)
How important is it to have political connections?	0.09
	(0.16)
How important is it to be born a man or a woman?	0.07
	(0.16)
How relevant is race?	-0.24
	(0.19)
How important is it to give bribes?	0.26
	(0.21)
How relevant is religion?	-0.20
	(0.24)
Constant	15.16***
	(0.33)
R-squared	0.0466
Adjusted R-squared	-0.0151
N. of cases	182.0000
F-statistic	0.7555

$^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$
Note: Data source is from 2009 ISSP.

Table 7 has a negative number of adjusted R-squared. It shows that perception in

Japan has a negligible effect on real wages. Therefore, I have excluded the perception factors

in the next regression models in Japan.

Table 8. Summary Statistics to Show Appropriate Data in Japan

Variable	Count	Mean	SD	Min	Max
Log(wage)	266	14.94	0.72	13.12	16.81
Male	266	0.65	0.48	0.00	1.00
Married	266	0.66	0.47	0.00	1.00
Male × Married	266	0.47	0.50	0.00	1.00
Higher Education	266	0.49	0.50	0.00	1.00
Professional Jobs	266	0.50	0.50	0.00	1.00

Note: Data source is from ISSP in 2009. The interaction term (Male×Married) have been made to measure the differential effect of Marriage on log wages between males and females. Table 8 did not involve any perceptions considering adjusted R squared revealed the relationship with log wages is negligible. The sample size was reduced to 266 to account for those who chose not to respond pertinent questions. The table only contained full-time workers, and people who earn zero income have excluded.

Table 9. Results for Predicting Wages for Full Time Workers in Japan

	(1) Log(wage) Coeff./Std. err.	(2) Log(wage) Coeff./Std. err.	(3) Log(wage) Coeff./Std. err.	(4) Log(wage) Coeff./Std. err.
Male	0.58***	0.72***	0.08	0.22
	(0.09)	(0.09)	(0.14)	(0.13)
Higher Education	0.19*			0.08
	(0.08)			(0.08)
Professional Jobs		0.43***		0.36***
		(0.08)		(0.08)
Married			-0.22	-0.25
			(0.13)	(0.13)
Male × Married			0.75***	0.72***
			(0.17)	(0.16)
Constant	14.47***	14.25***	14.67***	14.40***
	(0.08)	(0.09)	(0.10)	(0.11)
R-squared	0.1660	0.2319	0.2287	0.2973
Adjusted R-squared	0.1596	0.2261	0.2199	0.2838
N. of cases	266.0000	266.0000	266.0000	266.0000
F-statistic	26.1687	39.7055	25.8983	22.0038

$^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$
Note: Data source is as in Table 8.

In Model 1, individuals who completed higher education, on average, earn 19 percent more than high school graduate individuals, holding everything constant. This result is statistically significant at the .05 level. Additionally, Model 3 showed, on average, 75% of the difference in wage differential between married and non-married individuals due to gender. The interaction term revealed statistically significant at the .001 level. The following differential effect remains important by comparing other countries such as Korea, the U.S., and New Zealand, respectively, (see, **Table 5, Table 13**, and **Table 17**).

3.3 United States

Table 10: Perceptions of Importance in the U.S., 572 Respondents

Rank	Group	Important (%)	Not Important (%)
1	Hard working	99.65	0.35
2	Education yourself	99.13	0.87
3	Ambition	98.78	1.22

4	Social network	89.34	10.66
5	Well-educated parents	85.14	14.86
6	Wealthy family	62.41	37.59
7	Political connections	47.38	52.62
8	Race	26.92	73.08
9	Gender	22.73	77.27
10	Religion	15.73	84.27
11	Bribes	7.69	92.31

Note: Data description the same as Table 2.

In the U.S., wealthy family background and the role of well-educated parents seem to be necessary. However, the most potent perceptions are related to self-competent involving hard-working, self-education, ambition, and social network. It reflected what factors do people in the U.S. recognize essential to succeed.

Table 11. Regression of Perceptions with real wage in the United States

	Log(wage) Coeff./Std. err.
How important is hard work?	-0.95
	(0.62)
How important is having a good education yourself?	0.54
	(0.38)
How Important is having ambition?	0.76*
	(0.32)
How important is knowing the right people?	0.19
	(0.12)
How important is having well-educated parents?	-0.03
	(0.10)
How important is coming from a wealthy family?	0.04
	(0.08)
How important is having political connections?	-0.13
	(0.08)
How important is a person's race?	-0.05
	(0.10)
How important is being born a man or a woman?	0.08
	(0.10)
How important is a person's religion?	-0.22*
	(0.10)
How important is giving bribes?	-0.08
	(0.13)
Constant	10.14***

	(0.62)
R-squared	0.0372
Adjusted R-squared	0.0182
N. of cases	572.0000
F-statistic	1.9644

$^{*} p < 0.05,$ $^{**} p < 0.01,$ $^{***} p < 0.001$
Note: Data source is as in Table 1.

Table 11 revealed how the perceptions of respondents links to their real wages. On average, individuals who think to have ambition as necessary earn 76% more than those who do not, holding everything constant. Moreover, on average, people who think religion as important earn 22% less than those who do not, all other things being equal.

Table 12: Summary Statistics to Show Appropriate Data in the United States

Variable	Count	Mean	SD	Min	Max
Log(wage)	660	10.56	0.80	6.21	11.98
How Important is having ambition?	660	0.99	0.11	0.00	1.00
Male	660	0.52	0.50	0.00	1.00
Married	660	0.53	0.50	0.00	1.00
Male × Married	660	0.31	0.46	0.00	1.00
Higher Education	660	0.45	0.50	0.00	1.00

Note: Data source is from 2009 ISSP. The interaction term (Male×Married) have made to measure the differential effect of marriage on log wages between males and females. Table 12 carried one perception from Table 11, which was most significant in the regression model. The sample size was downsized to 660 in consideration of excluding the individual who refused to answer pertinent questions. The table only contained full-time workers, and people who earn zero income have excluded.

Table 13. Results for Predicting Wages for Full Time Workers in U.S.

	(1) Log(wage) Coeff./Std. err.	(2) Log(wage) Coeff./Std. err.	(3) Log(wage) Coeff./Std. err.	(4) Log(wage) Coeff./Std. err.
How Important is having ambition?	0.54			0.30
	(0.29)			(0.27)
Male		0.28***	0.16	0.18*
		(0.06)	(0.09)	(0.09)
Higher Education		0.52***		0.50***
		(0.06)		(0.06)
Married			0.11	0.06
			(0.09)	(0.09)
Male × Married			0.14	0.16

			(0.12)	(0.12)
Constant	10.03***	10.17***	10.37***	9.85***
	(0.28)	(0.05)	(0.06)	(0.27)
R-squared	0.0053	0.1274	0.0392	0.1391
Adjusted R-squared	0.0038	0.1248	0.0348	0.1325
N. of cases	660.0000	660.0000	660.0000	660.0000
F-statistic	3.5210	47.9733	8.9192	21.1378

$^*\, p < 0.05,\ ^{**}\, p < 0.01,\ ^{***}\, p < 0.001$

Note: Data source is as in Table 12.

The full model, Model 4, lodges the last column of the regression table. The R^2 value of this regression is 0.14. This means that 13.91 percent of the variation in income can be explained by variation in perceived importance of having ambition, gender, marriage, married male, and higher education. Conducting the joint hypothesis test will show whether the effect of gender and higher education is jointly significant or not in this regression. The unrestricted model for this F-test is Model 4 and the restricted model would be Model 2.

$H_0 : Male = 0\ and\ Higher\ Education = 0$

$H_A : Male \neq 0\ or\ Higher\ Education \neq 0$

$$F = \frac{\dfrac{R_u^2 - R_r^2}{q}}{\dfrac{1 - R_u^2}{n - k_u - 1}} = \frac{\dfrac{0.1391 - 0.1274}{2}}{\dfrac{1 - 0.1391}{660 - 5 - 1}} \approx 4.4$$

The F-value above is larger than the F-statistic, which is F (2, 654) = 2.9957, p<0.05), so I find evidence to reject the null hypothesis.

3.4 New Zealand

New Zealand Conscious factors

Table 14: Perceptions of importance in New Zealand, 355 Respondents

Rank	Group	Important (%)	Not Important (%)
1	Ambition	99.44	0.56
2	Hard working	99.15	0.85
3	Education yourself	97.18	2.82

4	Well-educated parents	74.93	25.07
5	Social network	70.99	29.01
6	Wealthy family	39.15	60.85
7	Gender	19.44	80.56
8	Race	15.21	84.79
9	Political connections	13.52	86.48
10	Religion	6.48	93.52
11	Bribes	3.10	96.90

Note: Data description the same as Table 2.

Table 15. Regression of Perceptions with real wage in New Zealand

	Log(wage) Coeff./Std. err.
How Important is having ambition?	0.15
	(0.38)
How important is hard work?	0.67*
	(0.33)
How important is having a good education yourself?	0.37*
	(0.17)
How important is having well-educated parents?	0.04
	(0.07)
How important is knowing the right people?	-0.14*
	(0.07)
How important is coming from a wealthy family?	0.01
	(0.06)
How important is being born a man or a woman?	-0.03
	(0.08)
How important is a person's race?	-0.06
	(0.10)
How important is having political connections?	0.01
	(0.09)
How important is a person's religion?	0.14
	(0.13)
How important is giving bribes?	-0.25
	(0.19)
Constant	9.85***
	(0.53)
R-squared	0.0675
Adjusted R-squared	0.0376
N. of cases	355.0000
F-statistic	2.2586

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Note: Data source is as in Table 14.

New Zealand also recognized the hard-working, self-education, and social network as an important factor in a 5 percent significant level.

Table 16: Summary Statistics to Show Appropriate Data in New Zealand

Variable	Count	Mean	SD	Min	Max
Log(wage)	377	10.93	0.52	8.52	11.70
How important is hard work?	377	0.99	0.09	0.00	1.00
Male	377	0.58	0.49	0.00	1.00
Married	377	0.62	0.49	0.00	1.00
Male × Married	377	0.41	0.49	0.00	1.00
Higher Education	377	0.32	0.47	0.00	1.00
Professional Jobs	377	0.44	0.50	0.00	1.00

Note: Data source is from 2009 ISSP. The interaction term (Male×Married) have made to measure the differential effect of marriage on log wages between males and females. Table 16 carried one perception from Table 15, which was most significant in the regression model. The sample size lessened to 377 in consideration of excluding the individual who refused to answer pertinent questions. The table contained no more than full-time workers, and people who earn zero income have excluded.

Table 17. Results for Predicting Wages for Full Time Workers in New Zealand

	(1) Log(wage) Coeff./Std. err.	(2) Log(wage) Coeff./Std. err.	(3) Log(wage) Coeff./Std. err.	(4) Log(wage) Coeff./Std. err.
How important is hard work?	0.97**			0.85**
	(0.30)			(0.28)
Male		0.24***	0.09	0.21*
		(0.05)	(0.09)	(0.08)
Higher Education		0.21***		0.21***
		(0.06)		(0.06)
Professional Jobs		0.27***		0.25***
		(0.06)		(0.06)
Married			0.14	0.11
			(0.08)	(0.08)
Male × Married			0.02	0.01
			(0.11)	(0.10)
Constant	9.97***	10.61***	10.79***	9.72***
	(0.30)	(0.05)	(0.06)	(0.28)
R-squared	0.0271	0.1441	0.0345	0.1781
Adjusted R-squared	0.0245	0.1372	0.0267	0.1648
N. of cases	377.0000	377.0000	377.0000	377.0000
F-statistic	10.4509	20.9353	4.4363	13.3638

$^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$
Note: Data source is as in Table 15.

The full model, Model 4, occupies the last column of the regression table. The R^2 value of this regression is 0.18. This means that 17.81 percent of the variation in income can be explained by variation in perceived importance of hard-working, gender, marriage, married male, higher education, and working in professional occupations. Model 2 has all factors statistically important at 0.1 percent. Therefore, by performing a joint hypothesis test on Model 2, it can determine whether certain variables are important to consider in conjunction. The unrestricted model for this F-test is Model 4 and the restricted model would be Model 2.

$H_0 : Male = 0 \ and \ Higher \ Education = 0 \ and \ Professional \ Jobs = 0$

$H_A : Male \neq 0 \ or \ Higher \ Education \neq 0 \ or \ Professional \ Jobs \neq 0$

$$F = \dfrac{\dfrac{R_u^2 - R_r^2}{q}}{\dfrac{1 - R_u^2}{n - k_u - 1}} = \dfrac{\dfrac{0.1781 - 0.1441}{3}}{\dfrac{1 - 0.1781}{377 - 6 - 1}} \approx 5.1$$

This F-value above is greater than the F-statistic, which is F (3, 733) = 2.6049, p<0.05), so I find evidence to reject the null hypothesis.

4. Conclusion

The above figures show that gender gap in payment is pervasive also in the four OECD countries such as Korea, Japan, the U.S., and New Zealand as well as all over the world. However, but it is highly intersected with culture and class specially in those countries. In most of them, people tend to maintain a cultural belief that personal competence is more important for success and any failure or even gender gap in payment is due to lack of competence rather than sexism. Additionally, in those countries, parents' wealth and social rank play a significant role for success, which means that class division is recognized as a main factor in gender gap in payment instead of sexism. Importantly, the race portion appears to be important only when their population is multiracial. In the meantime, gender seems to be insignificant for success and payment gap compared to other factors.

All perception regression tables showed that there is no relation between the political connection, bribes with real wages in four countries. According to Niederle (2007), "an environment where women and men perform equally well, and where issues of discrimination or time spent on the job do not have any explanatory power. Nonetheless, we find large gender differences in the propensity to choose competitive environments."(p.42). However, regression suggests more important perception factors such as education, ambition and hard work different from Niederle's finding. It underlines self-conquest more than the fact that females choose a less-competitive environment compare to males.

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