Panel Data Analysis: Gender Wage Gap and Macroeconomic Factors Impacts

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Abstract:

This paper study the relationship between the gender wage gaps and macroeconomic factors that would impact them. The paper use panel data with data collected from OCED and World Bank WDI Indicator. The results show that the difference between female and male life expectancy, import, and female labor participation has a positive impact on the gender wage gap. FDI and Women business and law index score has a negative impact the gender wage gap.

JEL Classification: J16, F4, F43

Key Word: Gender wage gap, panel data

1.0 INTRODUCTION:

The difference between gender is a topic that has been discussed a lot more recently year. There are lots of ways that two gender are treated differently. For example, females tend to have a lower degree than males in lots of countries. Different countries have different customs that lead to the result. For example, in China, back in old times, as a female married a male, their children only go with the last name of the male instead of the female, so that the family of the female would lose their inheritance as their family is not inherited. As a result, women are less likely to be supported to go to school. Also, since males are believed to be more intelligent than females, families tend to support male than females.

Although the discrimination against females is getting awareness by the government, there are still things that could be understood as unbalance between females and males in their working field. One of the examples would be the “motherhood penalty”. It is the negative effects of childbirth on a mother’s employment and wages as they need to have enough rest both before and after giving birth. The research paper by Yu-Wei Luke et al. (2020) discusses its effects and comes to a conclusion that childbearing on mothers’ labor supply is less negative in countries with smaller gender wage gaps and declines in a country’s gender wage gap is strongly associated with reductions in the motherhood employment penalty.

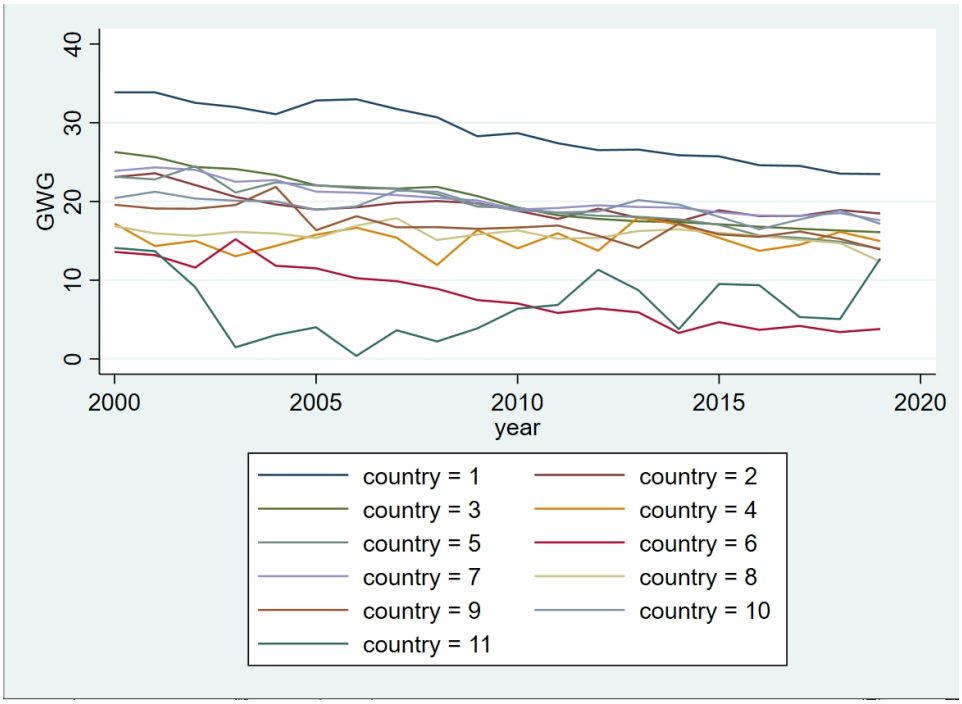
In this paper, we are focusing on the impact of openness of the country has been presented as the import per year, the difference between the life expectancy of males and females, the gross domestic product (GDP) growth, the women's business and law index score, Foreign direct investment(FDI), and female labor force participation rate to the gender wage gap with data from 11 countries from the year 2000 to 2019. We expected that the openness of the country would have a positive impact on the gender wage gap that is the higher the openness of a country, the lower the gender wage gap would be. As a country is more open, the people would tend to have a better idea of the gender wage gap so that it would diminish. The women's business and law index score is the knowledge and analysis provided by Women, Business and the Law make a strong economic case for laws that empower women. Better performance in the areas measured by the Women, Business, and the Law index is associated with more women in the labor force and with higher income, and improved development outcomes. Equality before the law and economic opportunity is not only wise social policy but also good economic policy. The equal

participation of women and men will give every economy a chance to achieve its potential. Life expectancy is the data that on average, how long would a male or female would live, we believe it is important as it reflects how males and females are treated in that country. The FDI is the measurement of how the foreign investor invests in the country and can be seen as a factor in how open a country is. The female labor force participation rate is a factor that reflects how female labor is treated in the country and should have a positive relationship with the gender wage gap as a lower gender wage gap should lead to a lower female labor participation rate.

2.0 Trend:

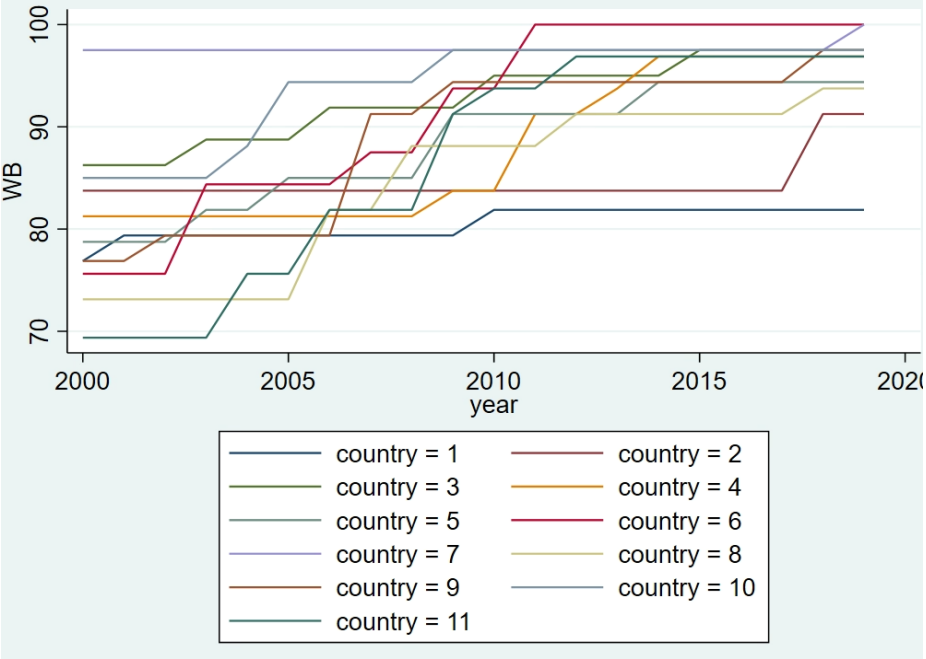
Figure 1 shows the gender wage gap in 11 countries from 2000 to 2019 (Country1=Japan, 2=USA,3=UK,4=AUS,5=AUT,6=BEL,7=CAN,8=CZE, 9=DEU, 10=FIN,11=HUN). From the graph, it can be seen that the gender wage gap in most countries is getting lower, it is a good sign to be seen as the gender wage gap is a type of discrimination against females. Figure 2 gives an overview of the Women's business and law index from the year 2000 to 2019.

Figure 1: Gender wage gap in 11 countries from 2000 to 2019



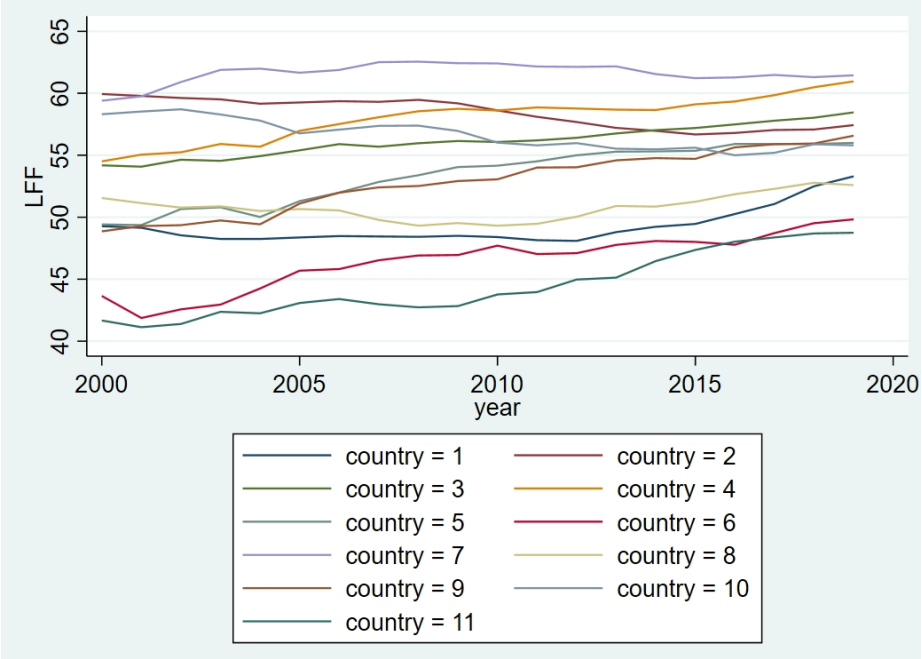
Source: OECD

Figure 2: Women's Business and Law Index from 2000 to 2019



Source: World Bank Database

Figure 3: female labor force participation rate from 2000 to 2019



Source: World Bank Database

3.0 Literature Review:

Audi et al. (2017) conduct research about the relationship between the openness of the society (trade liberalization) of SAARC countries and the gender gap. From their model, they find that the relationship between female unemployment rates with GDI is insignificant but negative, when the gross domestic product is increasing, the gender gap (female to male labor participation rate) will go down. And the relationship between GDP growth and the female-to-male participation rate is positive and significant which means growth in the economy encourages the participation of females in the labor market which reduces the gender gap.

Vaccaro et al. (2022) study the gender wage gap in Peru and its relationship with education. Their model shows the result that education in the unexplained and explained component contributes to reducing the observable gap between working men and women. And the GDP per capita is negatively correlated with the gender wage gap.

Seguino (2000) discusses the relationship between gender inequality and GDP growth rate by using panel data for analysis. They concluded that gender wage inequality and growth are positively correlated with each other which is different than the result of Audi et al. (2017).

Mussida and Picchio (2012) discuss the relationship between the gender wage gap and education in Italy. They find that female employees who have lower education level tend to receive more wage penalty than female employees who has higher education level. Mussida and Picchio conclude that “First, if men and women had the same characteristics women would suffer significant and large pay penalties, independently on whether we correct for nonrandom selection into full-time employment and on educational levels. Second, low educated women suffer much larger pay penalties, especially after correcting for sample selection and at the bottom of the wage distribution.” (2012)

Seguino（1997）investigates the relationship between gender, wage inequality, and export growth in South Korea. The study shows different results than previous studies as the study shows that gender inequality does not contribute to export-oriented growth strategy, and the reason may be because the particular country the author chose may not apply to other markets.

Stokke (2021) studies the gender wage gap and how its education and real experience impact it. And the study shows that the gender wage gap uses the potential rather than actual, real experience. And higher education workers would receive more which is reasonable.

Langdon and Klomegah (2013) study more generally the gender wage and factors that impact it, such as occupation, education, and traditional gender ideology. They come to the conclusion that there are lots of important factors that impact the gender wage gap, occupation, education, race, age, and gender ideology all have a significant impact on it. And gender ideology is the most important factor in their study.

4.0 Data and Empirical Methodology

4.1 Data

The study uses gender wage gap data from OECD and other variables gathered from World bank Database for twelve countries within the period 2000 to 2019. The countries are picked from different Continents including Asia, Euro, and North America.

Table 1: Data Summary

Variable	Obs	Mean	Std. dev.	Min	Max
gwg	220	17.32763	6.383937	0.384387	33.86467
gdp	220	2.033717	2.10603	-8.074448	6.868609
WB	220	89.09115	7.80452	69.375	100
Dlifeexpectency	220	-5.531682	1.100845	-8.5	-3.6
import	220	40.44477	21.2701	19.5596	168.3407
FDI	220	4.561183	9.877758	-40.08105	60.06159
LFF	220	53.45223	5.389197	41.13	62.55

4.2 Empirical Model

Model

$$GWG=GWG=\alpha+\beta1*GDP+\beta2*WB+\beta3*life+\beta4*import+\beta5*FDI+\beta6*LFF+\gamma$$

GWG: gender wage gap (%)

GDP: GDP growth (annual %)

IMPORT: import (% of GDP)

Dlifeexpectency: male life expectancy -female life expectancy

WB: women business

FDI: foreign direct investment

5.0 Empirical Results

Table 2: Result Table

Variable	Coefficient	Std. err.	P value
gdp	**.1199456**	**.0827238**	**0.149**
import	**-.1113024****	**.0516457**	**0.032**
WB	**.0957646***	**.0511191**	**0.062**
life	**-2.754769*****	**.6039036**	**0.000**
FDI	**.0309553***	**.017376**	**0.076**
LFF	**-.2758755****	**.1263987**	**0.030**

5.1 Conclusion

In summary, from the result of the regression, the difference between life expectancy, import, and female labor participation has a positive impact on the gender wage gap. FDI and Women's business and law index score has a negative impact on the gender wage gap. The GDP impact is not statistically significant.

The study discusses the impact of macroeconomic factors on the gender wage gap. There are lots of limitations of the study, first, the data set is not large enough as there are not enough data included in the data set, only 11 countries with 20 years range of data are included, the more data included in the study, the better the prediction of the result could be. The government could pay more attention to the law and regulations that help females build their carrier, from the study, the WB is negatively related to the gender wage gap which may show that the laws and regulations are not enough to help females with their carrier.

Bibliography

Hussain, M. A., & ., A. A. (2018). Gender gap and trade liberalization: An analysis of some selected SAARC countries. *Advances in Social Sciences Research Journal*, *5*(11).

Langdon, D. L., & Klomegah, R. (2013). Gender wage gap and its associated factors: an examination of traditional gender ideology, education, and occupation. *International Review of Modern Sociology*, *39*(2), 173–203.

Mussida, C., & Picchio, M. (2012). The gender wage gap by education in Italy. *SSRN Electronic Journal*.

Chu, Y.-W. L., Cuffe, H. E., & Doan, N. (2020). Motherhood Employment Penalty and Gender Wage Gap across countries: 1990–2010. *SSRN Electronic Journal*.

Seguino, S. (1997). Gender wage inequality and export-led growth in South Korea. *The Journal of Development Studies*, *34*(2), 102–132.

Seguino, S. (2000). Gender inequality and economic growth: A cross-country analysis. *World Development*, *28*(7), 1211–1230.

Vaccaro, G., Basurto, M. P., Beltrán, A., & Montoya, M. (2022). The gender wage gap in Peru: Drivers, evolution, and heterogeneities. *Social Inclusion*, *10*(1), 19–34.

Woetzel, J., Madgavkar, A., Ellingrud, K., Labaye, E., Devillard, S., Kutcher, E., Manyika, J., Dobbs, R., & Krishnan, M. (2020, September 16). *How advancing women's equality can add $12 trillion to global growth*. McKinsey & Company. Retrieved March 19, 2022.

Stokke, H. E. (2021). The gender wage gap and the early-career effect: The role of actual experience and education level. *LABOUR*, *35*(2), 135–162.