Measures of Socialism and Gender Equality: A Quantitative Analysis

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Introduction

Gender Equality has been a momentous global mission ever since the United Nations General Assembly organized the first World Conference on Women in 1975. In subsequent years, the international feminism movement has been supported by policies initiated by governments, non-profit organizations, and private corporations around the world. Yet, according to OECD reports, the United Nations' most recent goal for gender equality in their 2030 Agenda for Sustainable Development will still require over 200 years to achieve at the current rate of progress (OECD, 2019). This might be due to the fact that while many countries have made promising strides in reducing their gender gap, others have lagged behind. What has made some countries achieve more progress in gender equality than others?

Simone Beauvoir, a socialist and a pioneer of the feminist movement, has had mixed opinions on the relationship between a country's political ideology and its gender gap. In her 1951 essay *The Second Sex*, she expressed confidence in the achievement of gender equality through the destruction of capitalism and realization of a socialist society worldwide. Based on this understanding, a country operating on the principles of socialism would see greater gender equality than a country operating on the principles of capitalism. However, in a 1976 interview, Simone Beauvoir presented a newfound realization on the relationship between the sex struggle and the class stuggle. Twenty-five years after the publication of *The Second Sex*, she realized that on the contrary, resolution of "the class struggle did not eliminate the sex struggle" (Beauvoir, 1976). In other words, whether a country has more gender equality is not influenced by whether it is a socialist or capitalist society.

This paper seeks to explore Beauvoir's mixed opinions by answering the question: **how are measures of socialism related to measures of gender equality in a country?** I **hypothesize** that a country's ascension or descension on the socialism scale has no effect on its gender equality. My hypothesis aligns with Beauvoir's 1976 statement and rejects her earlier belief in *The Second Sex*.

In this paper, I will use linear regressions to quantify the correlations between socialism and gender equality measurements. Moreover, I will test to see whether the null hypothesis that socialism indicators have no effect on gender equality indicators can be rejected.

I will not be measuring class struggles or sex struggles as social movements, nor will I be able to conclude a causal or non-causal relationship between socialism and gender equality. I will only be analyzing observational data to describe correlations between degrees of socialism and gender equality. Nonetheless, my paper will encourage people to reflect on whether Beauvoir was rightly optimistic in *The Second Sex* or whether her later statement was more accurate. Moreover, it can motivate us to examine and engage with both socialism and gender issues in a different light. We might also be able to accept or eliminate differences in ideological narratives as a reason for why countries have differed in their progress towards gender equality.

Description of data and measures

In this paper, I define socialism in contrast to capitalism. According to the classical Marxist definition, a capitalist society is at the very least indicated by (1) private ownership and control of the majority of production means, (2) existence of wage labor, and (3) economic production motivated by profit rather than the satisfaction of human needs (Gilabert, Pablo and Martin O'Neill, 2019). Therefore, I define a socalist society to exhibit **(1*) collective ownership and control of the majority of production means**, **(2*) high labor power**, and **(3*) economic production motivated by the satisfaction of human needs rather than by profit.**

I use historical data on the **Percentage of Women in Parliaments** (University of Zurich, 2020) and the United Nations' **Gender Inequality Index (GII)** (MaryamRez, 2018) as two measures of gender equality. To quantify each of the three socialism indicators, I use historic data on **state control index** (OECD, 2013) to measure (1*), **union density** (University of Zurich, 2020) to measure (2*), and

government social assistance (University of Zurich, 2020) to measure (3*). Further, I derive a composite socialism index by performing factor analysis on the three indicator variables.

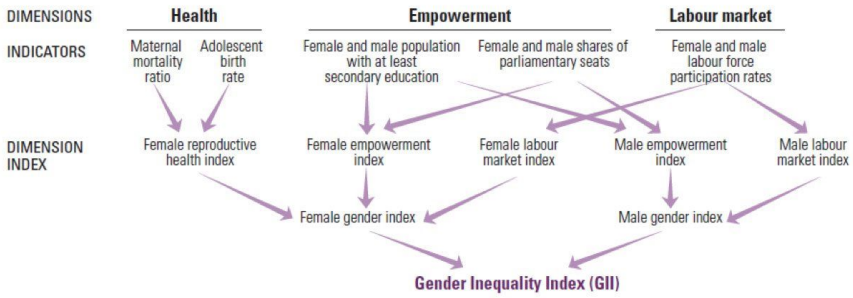


Diagram illustrating the derivation of the GII. (Human Development Report, 2020)

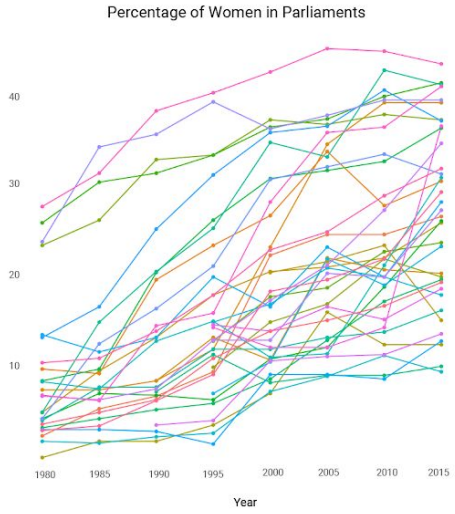
The OECD defines the State Control Index as an aggregate indicator representing public ownership and government involvement in business operations. It takes into consideration the Scope of State-owned Enterprises (SOEs), Government Involvement in Network Sectors, Government Direct Control, Governance of SOEs, and the Involvement in Business Operations index (Price controls, Command & control regulation, Public procurement). The OECD only provides data on this index for the years 1998, 2003, 2008, and 2013. To correspond with the available gender equality variables, I adjust 1998 to 2000, 2003 to 2005, 2008 to 2010, and 2013 to 2015.

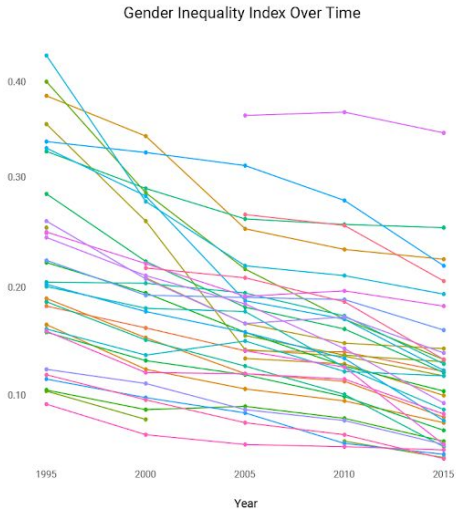
The University of Zurich Comparative Political Data Set defines Union Density as net union membership in proportion to wage and salary earners in employment. It defines Government Social Assistance as social assistance grants and welfare benefits paid by the general government (benefits for sickness, old-age, family allowances, etc.) as a percentage of GDP.

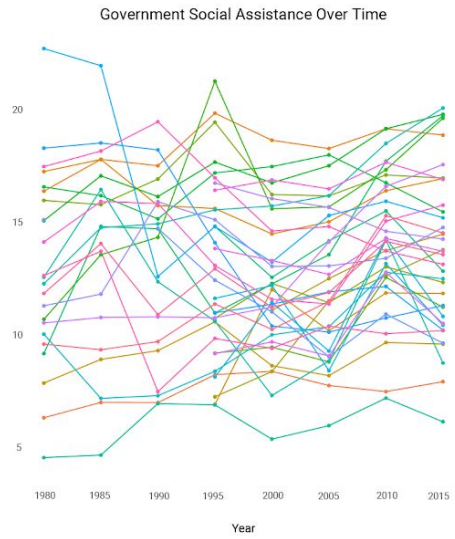
I also use Growth of Real GDP (percent change from previous year) and Unemployment rate from the University of Zurich dataset as confounding variables for my regression analyses.

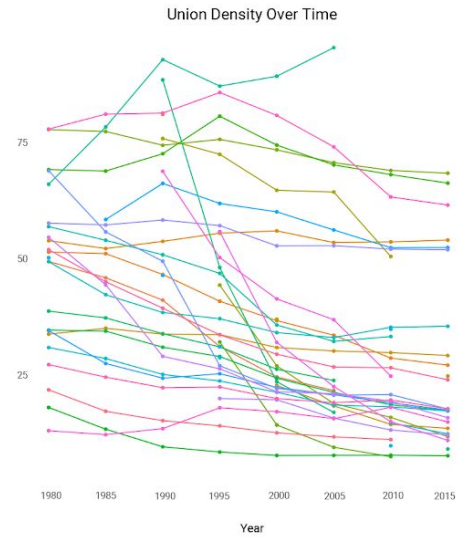
Variables

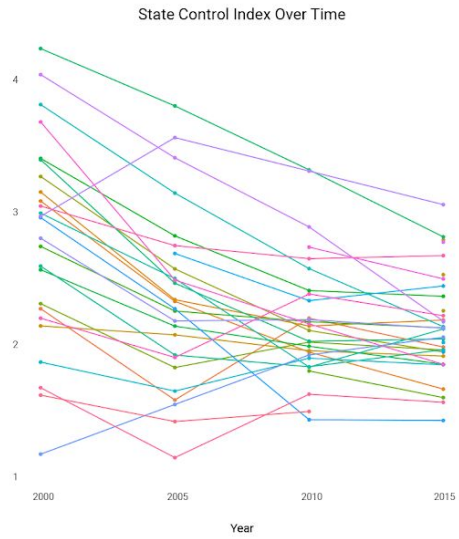
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Year	260	1,998.923	11.098	1,980.000	1,990.000	2,010.000	2,015.000
Countries	36						
Gender Inequality Index	172	0.169	0.083	0.040	0.113	0.210	0.474
Percentage of Women in Parliaments	257	18.896	11.436	0.000	9.500	26.800	45.300
State Control Index	113	2.353	0.619	1.153	1.950	2.742	4.241
Union Density	224	38.507	21.866	7.710	20.195	53.990	95.560
Government Social Assistance	247	13.162	3.614	4.590	10.510	15.910	22.750
Real GDP Growth	248	3.234	2.678	-5.480	1.812	4.235	25.120
Unemployment Rate	249	7.743	4.277	0.210	4.800	9.700	24.900











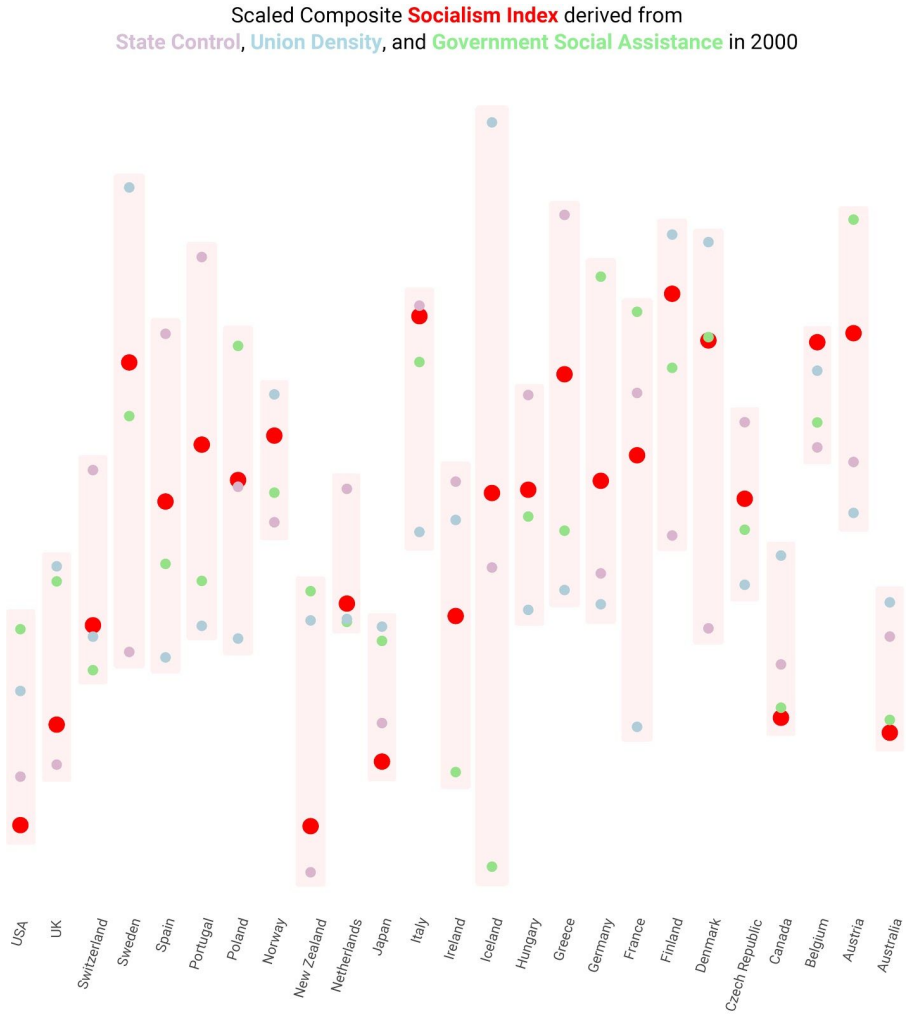
Over the past few decades, countries have seen a general increase in Percentage of Women in Parliaments and a general decrease in GII. This aligns with the global progress in reducing the gender gap.

Out of the three socialism indicators, State Control Index and Union Density in most countries have seen a decrease while overall Government Social Assistance has remained relatively consistent, with a slight incline.

Variable from Factor Analysis

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Socialism Index	98	-0.000	0.577	-1.081	-0.526	0.475	1.075

I perform factor analysis using the "Compind" R package's *ci_factor* function. The composite indicator estimated values are equal to component score multiplied by its proportion variance.



This plot indicates the relationship between the composite index and the individual variables in the year 2000.

Regression Equations

$$GII_{it} = \alpha + \beta_1\ State\ Control_{it} + \beta_2 Union\ Density_{it} + \beta_3 Gov\ Assis._{it} + \beta_4 Year_t + \beta_3 Unemploy_{it} + \beta_4 GDP\ Growth_{it} + \gamma_i + \varepsilon_{it}$$

$$\%\ Women\ Par_{it} = \alpha + \beta_1\ State\ Control_{it} + \beta_2 Union\ Den._{it} + \beta_3 Gov\ Assis._{it} + \beta_4 Year_t + \beta_3 Unemploy_{it} + \beta_4 GDP\ Growth_{it} + \gamma_i + \varepsilon_{it}$$

$$GII_{it} = \alpha + \beta_1\ Socialism\ Index_{it} + \beta_2\ Year_t + \beta_3\ Unemployment_{it} + \beta_4\ Real\ GDP\ Growth_{it} + \gamma_i + \varepsilon_{it}$$

$$\%\ Women\ in\ Par_{it} = \alpha + \beta_1\ Socialism\ Index_{it} + \beta_2\ Year_t + \beta_3\ Unemployment_{it} + \beta_4\ Real\ GDP\ Growth_{it} + \gamma_i + \varepsilon_{it}$$

γ_i denotes fixed characteristics of each country that are not captured by the observed variables. In each regression, **the null hypothesis H_0 is that the value of each β coefficient is zero**. In other words, the effect of each independent variable increase on the gender equality variables is zero.

Results

	Dependent variable:	
	Gender Inequality Index (1)	Percentage of Women in Parliaments (2)
Year	-0.004*** (-0.004, -0.003)	0.431*** (0.253, 0.610)
State Control Index	0.012** (0.004, 0.019)	-2.568** (-4.271, -0.864)
Union Density	-0.001* (-0.002, -0.0001)	0.284* (0.029, 0.538)
Government Social Assistance	-0.002 (-0.006, 0.001)	0.780* (0.046, 1.514)
Unemployment Rate	0.001 (-0.001, 0.002)	-0.320 (-0.665, 0.025)
Real GDP Growth	-0.003* (-0.005, -0.0003)	0.277 (-0.223, 0.777)
Constant	7.372*** (5.710, 9.035)	-847.249*** (-1,207.383, -487.116)
Observations	94	98
R^2	0.973	0.957
Adjusted R^2	0.955	0.931
Residual Std. Error	0.012 (df = 56)	2.782 (df = 60)
F Statistic	53.969*** (df = 37; 56)	36.460*** (df = 37; 60)
Note:	*p<0.1; **p<0.05; ***p<0.01; CI: 0.90; Contains factor(Countries)	

In the first set of regressions, we can say with at least 90% confidence that the variables **Year, State Control Index, Union Density, and Real GDP Growth have nonzero effects on the GII**, while **Year, State Control Index, Union Density, and Government Social Assistance have nonzero effects on the Percentage of Women in Parliaments**. In other words, **we can reject the null hypothesis** that the value of each of these coefficient is zero because they are indicated with at least one asterisk * symbol. Out of the three socialism indicators, an increase in one unit of the State Control Index likely has the greatest effect on gender equality and is correlated to a decrease in gender equality. However, we must keep in mind that whereas Union Density and Government Social Assistance are measured in percentages, the State Control Index has a much narrower range, meaning that one unit change in it is not proportional to one unit change in the other two variables. Out of the two confounding variables, only Real GDP Growth had a 90% statistically significant effect on the GII, while the other variables likely have no confounding effect.

	Dependent variable:	
	Gender Inequality Index (1)	Percentage of Women in Parliaments (2)
Socialism Index	0.009 (-0.007, 0.025)	-1.494 (-4.864, 1.876)
Year	-0.004*** (-0.004, -0.003)	0.432*** (0.294, 0.570)
Unemployment	-0.001 (-0.002, 0.0002)	0.119 (-0.168, 0.405)
Real GDP Growth	-0.001 (-0.003, 0.001)	-0.127 (-0.656, 0.402)
Constant	7.177*** (5.949, 8.405)	-843.077*** (-1,118.350, -567.805)
Observations	94	98
R^2	0.966	0.945
Adjusted R^2	0.945	0.914
Residual Std. Error	0.013 (df = 58)	3.113 (df = 62)
F Statistic	46.593*** (df = 35; 58)	30.388*** (df = 35; 62)
Note:	*p<0.1; **p<0.05; ***p<0.01; CI: 0.90; Contains factor(Countries)	

When the three socialism variables are combined into a composite Socialism Index using factor analysis, **we cannot say with at least 90% confidence that increase of the Socialism Index has a nonzero effect on the gender equality variables. We cannot reject the null hypothesis** that the values

of its coefficients are zero because the p-values of the Socialism Index coefficients are larger than 0.1. Yet, given the mostly positive range of the 90% confidence interval (-0.007, 0.025), we can suspect that a one unit increase in the Socialism Index most likely correlates to an increase in the GII. On the other hand, the mostly negative range of the 90% confidence interval (-4.864, 1.864) suggests that a one unit increase in the Socialism Index is most likely correlated to a decrease in the Percentage of Women in Parliaments. Similar to the prior regression results, the confounding variables have no statistical significance on either the GII nor Percentage of Women in Parliaments. As such, they likely have no confounding effect.

Conclusion

The two sets of regression analyses generate results with different statistical significance. Analyzed individually, two of the three socialism indicators, State Control Index and Union Density, have statistically significant effects on gender equality measurements. In particular, while countries with high state control are linked to lower gender equality, countries with high union density are linked to higher gender equality. This suggests that different indicators of socialism might have opposite effects on gender equality. In other words, characteristics within the same ideology can be contradictory in certain respects.

However, when all three socialism indicators are combined in factor analysis to derive a Socialism Index, this composite variable harbors no statistically significant effect on gender equality variables. As such, **while the first set of results reject the original hypothesis that factors of socialism have no effect on gender equality, the latter results confirm it**. A next step to this study can try to explain this inconsistency as to why individual versus composite analysis yield different results.

This study is limited primarily by the sample size of the data. The United Nations only began calculating the Gender Inequality Index in the 1990s, and even though the Percentage of Women in Parliaments data dates back to 1980, it is not a holistic representation of gender equality. Similarly, a very important socialism indicator, the State Control Index, was also only recorded beginning in the late 1990s.

Lack of data points before the fall of the Berlin Wall in 1989 results in a limitation to measuring changes in socialism as the historic event marked many counties' abandonment of communist and socialist ideologies. Further research should begin by improving upon these missing data.

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