

The Effect of Female Empowerment on Long-Term Government Spendings

Koç University



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Abstract

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Female empowerment is a crucial phenomenon taken seriously by many countries. Increased labor force participation, educational attainment and political representation are all the ways that can be used to empower women and make their voices, needs, concerns and demands heard. The importance can be better understood when the differing preferences of men and women are discussed. Women tend to spend the majority of each additional income obtained for their family, the education and health of their children compared to men. Additionally, women are more patient and altruistic. In the light of these pieces of information, it can be said that they would favor a larger share of government spending to be dedicated to longer-term investments that can be considered as altruistic, such as health, education, and environmental protection areas. In this study, it is hypothesized that increased female labor participation share, educational attainment and political representation are correlated with the increased share of government spending on education and health in GDP. A panel of 38 OECD countries is examined and it is revealed that the predicted correlation exists most of the time. However, the observed associations are driven by the effect of time series and they are not as strongly as guided by the cross-country differences since the variation between the countries is too high to be the driving force behind the relationships revealed here.

Özetçe

Kadın Güçlendirmesinin Uzun Dönemli Hükümet Yatırımları Üzerindeki Etkisi

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Kadınların güçlendirilmesi pek çok ülke tarafından ciddiye alınan önemli bir olgudur. İş gücüne katılım oranı, eğitimsel ve siyasal katılımın arttırılması kadınların sesinin, ihtiyaçlarının ve taleplerinin duyulmasını sağlamak ve onları güçlendirmek için önemli yollar olarak değerlendirilebilir. Kadın ve erkeklerin tercihleri arasındaki farklılıklar göz önünde bulundurulduğunda, kadınların güçlendirilmesinin önemi daha iyi anlaşılabilir. Erkeklerle kıyasla kadınlar elde ettikleri her bir ek geliri, daha çok çocuklarının eğitimi ve sağlığı için harcamayı tercih etmektedirler. Buna ek olarak kadınların daha sabırlı, gelecek odaklı ve özgecil oldukları bildirilmektedir. Bu bilgiler ışığında, kadınların eğitim, sağlık ve çevre koruması gibi daha uzun dönemli ve altruistik devlet yatırımlarının GSYH içindeki oranının daha yüksek olmasını tercih edecekleri söylenebilir. Bu çalışmada kadınların iş gücü, eğitim ve siyasete katılım oranının, hükümet tarafından yapılan eğitim ve sağlık harcamalarının GSYH'deki payı ile anlamlı bir ilişki sergilemesi beklenmektedir. 38 Ekonomik İşbirliği ve Kalkınma Örgütü üyesi ülkenin incelenmesi sonucunda belirtilen ilişkilerin çoğu zaman var olduğu görülmüştür. Ancak, gözlemlenen bu ilişkilerin zaman serisi ile yürütüldüğü ve ülkeler arası farklılıkların aynı oranda güçlü olmadığı sonucuna ulaşılmıştır.

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Contents

1	Introduction	1
2	Literature Review	4
2.1	Female Participation in Education	4
2.2	Female Participation in Labor Force	5
2.3	Female Participation in Politics	7
2.4	Female Preferences	9
3	Data	11
3.1	Dependent Variables	12
3.2	Independent Variables	13
3.3	Control Variables	14
3.4	Variables for the Additional Analysis	16
4	Methodology	18
4.1	Education Spending	19
4.2	Health Spending	20
4.3	Environmental Protection Spending	21
4.4	Income Inequality	22
5	Results	25
5.1	Education Spending Results	25
5.2	Health Spending Results	28
5.3	Environmental Protection Spending Results	31
5.4	Income Inequality Results	33
6	Conclusion	39
	References	41
	Appendix	46

List of Tables

Table 3.1: Descriptive summary statistics.	11
Table 5.1: Results of education spending regressions.	26
Table 5.2: Results of health spending regressions.	29
Table 5.3: Results of environmental protection spending regressions.	32
Table 5.4: Results of income inequality regressions with respect to Kuznet.	35
Table 5.5: Results of income inequality regressions without Kuznet's hypothesis.	37

Chapter 1

Introduction

The Covid-19 pandemic reveals an unprecedented asymmetric shock where no one is affected at the same level. Although some of the developments proved to be inequality-reducing, most of them continued to deepen the inequality experienced in many countries. Especially in countries where domestic labor involving cooking, cleaning, and caregiving is considered the responsibility of the female members of a traditional family, participating in education and the labor force may become harder for women. This proposition has a significant implication in the political arena when one dives deeper into the subject. For instance, Cebula and Alexander (2017) provide empirical evidence on the close relationship between female labor force participation and voter participation rate, which reveals that as the females attend to the labor force more, voter participation rate tends to increase as well, since working females realize the political power that they hold on their economic well-being. Furthermore, both experimental (Sondheimer & Green, 2010) and empirical studies (Tenn, 2005) suggest that higher education levels yield higher voter turnout. Hence, education and labor force participation are important factors for women to take a more active place in politics. Voting is one of the most crucial actions in democracies which allows the needs and wants of the voters to be represented and discussed. As a result, high education and labor force participation may enable women to voice their preferences through increased political involvement with higher voting rates.

Political participation and representation of women are significant as the policy preferences differ substantially between men and women, both as voters (Lott & Kenny, 1999; Edlund & Pande, 2002; Funk & Gathmann, 2015) and as politicians (Slegten & Heyndels, 2015; Casarico et al., 2019). Overmore the divergence in the policy preferences, it is found that the time preferences of women and men are substantially different (Patnaik et al., 2020). Rubalcava et al. (2009) revealed that women are more future-oriented and prefer to invest more in the future than men. On the other hand, an extensive study (Horn et al., 2022) that is conducted using data from high schools in Hungary revealed that the time preferences do not differ

significantly between male and female students; whereas, female students are found to be significantly more altruistic. Additionally, various studies claim that women prefer larger governments (Alvarez & McCaffery, 2003) and contribute more to public goods (Dollar et al., 2001; Priyanka, 2020), which is in line with the al. Future orientation, willingness to contribute more to the public goods, and preference for larger governments can be considered as reflected in the decision-making processes of women both at the individual and governmental levels. Investing in education is proven to be returning benefits in the long run (Marconi, 2018), and Morrison et al. (2007) reveal that mothers tend to allot more of the household's resources towards the education and health of their children. Furthermore, numerous studies focusing on female politicians at different levels and countries demonstrate that female representatives prioritize governmental investment in education (Svaleryd, 2009; Clots-Figueras, 2012; Priyanka, 2020).

Returns to investment in education are received in the long term; hence, contributions made towards education, both at the household and state levels, require a look beyond and patience. In addition, an inclination for a higher share of education investment can be considered to be an altruistic move as it benefits future generations. As mentioned before, women tend to be more patient and more benevolent, and they want to provide more resources for education; as a result, investing in education can be listed as a priority for female voters and politicians. Nevertheless, for this preference to find a voice in the public sphere, it is crucial that women take an active role in politics through voting. For this to happen, participating in the labor force and receiving an education are essential, as these developments would make women's inclinations, concerns, and needs heard. In the light of this train of thought, it is hypothesized that in the countries where the female participation in the labor force, education, and parliaments is higher, the ratio of government expenditure to Gross Domestic Product (GDP) on factors that are paying out in the long run and public-spirited, such as education and health investments, is expected to be higher. The relationships between the variables will be investigated through panel data analysis for a sample of 38 Organization for Economic Co-operation and Development (OECD) member countries between the years 1950-2021, depending on the availability of the data. After testing the main hypothesis and carrying out the necessary analyses, an additional investigation will be done on the relationship between income inequality and the female empowerment variables to have a better understanding of the issue at hand.

The related literature will be provided in the next chapter. In Chapter 3, the details regarding the data that are used will be presented. Methodology and the analysis will be considered in Chapter 4, followed by the results and the related discussions in Chapter 5. Lastly, the concluding remarks regarding the study will

be mentioned in Chapter 6.



Chapter 2

Literature Review

2.1 Female Participation in Education

The effects of increasing education levels for women have been discussed extensively in the literature. Heath and Jayachandran (2017) stated that access to birth control is easier for more educated women, resulting in better health conditions for their children as the limited resources would be allocated for fewer children. Furthermore, they presented studies suggesting that increased female education also gives rise to higher educational opportunities for their children. After analyzing panel data for 44 countries for 20 years, Turanli et al. (2015) revealed that the girls to boys ratio for secondary education has a significant positive correlation with the human development index. Wang (2021) used an exogenous policy change in Indonesia to demonstrate the causal relationship between the effect of an additional year of schooling for females on neonatal mortality and found that as the education procrastinated marriage and the age of having the first child, neonatal mortality decreased for the cohort influenced by the policy change. In a similar vein, Grytten et al. (2014) utilized the compulsory school reform that took place in Norway to examine the relationship between the education of mothers and the birth weight of their children, and they reported that the more educated mothers were inclined to have children with heavier birth weights. Another longitudinal study by Wang et al. (2008) put forth that the education level of the mothers was one of the most crucial determinants of the developmental path for the infants born with very low weights in Taiwan; the main findings of the study suggest that infants with low birth weight were more prone to developmental risks if their mothers had less education compared to the low-birth-weight children of more educated mothers. Further, a study focusing on the Nepalese population (Fafchamps & Shilpi, 2011) demonstrated that more educated mothers preferred having smaller families but more educated and working children. While most studies focus on higher education levels, Andrabi et

al. (2012) concentrated on mothers with little education as it is a highly relevant case for most developing countries and revealed that the children of mothers with little education spent significantly more time on educational activities and scored higher results in tests.

In the light of these studies, the complexity of the relationship between the education of females and spending on education and health dimensions can be a very intriguing topic to deep dive into. On the one hand, the inclination of educated women to have fewer children may decrease the youth population of the countries, which may result in a decrease in education spending for countries. On the other hand, although the number of children might be decreased for educated women, their preference for providing more education to their children may give rise to the prioritization of spending on education for the governments. Hence, the relationship between the education of females and government spending on education should be investigated in a more detailed manner. Similarly, healthier children of educated women might be a good incentive for decreased health expenditures from the perspective of states. However, as aforementioned, slowing down of the youth population would be reflected in higher rates for the elderly population. As there are fewer children, in-family responsibilities for taking care of the elderly might lessen, which would be echoed as higher health expenditures undertaken by the governments. Additionally, as education increases voter turnout (Tenn, 2005; Sondheimer & Green, 2010), more educated women voice their preferences more, and if it is represented in the political realm, women's leaning toward long-term investments caused by their more patient nature (Patnaik et al., 2020) might lead to higher spending on health as preventive investments can be considered as longer-term expenditures. On top of that, as women are found to be more altruistic, and public investment in health can be considered as a more selfless act as it benefits all parts of society, especially the elderly, there is an expected relationship here. Similarly, an association for environmental spending is expected as it is also an altruistic investment that will benefit many generations. In short, the mechanisms that can be influential in determining the direction of the relationship between the education level of women and long-run investments such as expenditures on education and health by the governments as a percentage of GDP are unclear and must be examined further.

2.2 Female Participation in Labor Force

The unequal hit of the Covid-19 outbreak is evident in its impact on the labor market, and the employment situation of women seems to be more affected by the pandemic. A study by Dang and Nguyen (2020) revealed that the probability of losing a job permanently is higher for women by 24%, and this threat pushes women

to think that they will be in the red due to around a 50% decrease in their income. Studies focusing on the labor force participation and employment of female workers are especially crucial as the employment of women can be considered one of the main ways of empowering women. For instance, Afridi et al. (2016) showed that the higher labor force participation of women in India leads to a higher possibility of school enrollment and longer time spent in school for their children, and higher education expenses for the household in general, which is proven to be driven by the increased bargaining power of the working mothers. In another study conducted in Nigeria, Adeyem et al. (2016) presented the link between female labor force participation outside the home and the empowerment of women through actively participating in the decision-making processes in household decisions. Moreover, Atkin (2009) reported that women employed in a newly opened factory in Mexico had significantly taller children due to improved health conditions and the enhanced bargaining power of those women in a household. Be that as it may, the increased power of women is not the only benefit gained through higher female labor force participation. Onaran et al. (2022) constructed a macroeconomic model in which the effects of increasing government spending on social infrastructure rather than physical infrastructure are proven to contribute to women's employment and reduce the hours spent on domestic work, resulting in higher productivity. Another widely discussed topic in the female labor force participation rate literature is the relationship between fertility rates. The connection seems not to be straightforward; in some countries, a linear relationship is observed, while in others, a U-shaped link appears more prominent. An explanation for the U-shaped relationship is suggested by the gender equity values of the 27 countries in a study conducted by Arpino et al. (2015). The researchers suggested that as the female labor force participation increases, the fertility rates decrease to some extent when the transition to a more equitable partnership understanding is not established well yet. However, as female employment becomes the norm in society, the relationship turns upside down, and higher fertility rates are observed. This U-shaped linkage can be better understood if one assumes that the normalization of female employment may cause higher child-care investments and facilities, enabling women to have children and simultaneously participate in the labor force. On the other side, Van den Broeck and Maertens (2015) put forth that women's employment lowered the fertility rate and proved to be a reliable way of empowering poor women in rural Senegal. Correspondingly, Fang et al. (2013) demonstrated that the higher employment of women resulted in lower desired and actual fertility rates for Chinese women by using an instrumental variable to ensure the causality.

Higher labor force participation rates for women, especially working mothers, may require a social investment in childcare services and facilities as it will be harder

for full-time working mothers to take care of their children simultaneously. As employed women would have an easier time voicing their needs and preferences through voting, as indicated at the beginning, this may add to the pressure for raised contributions to the preschool expenditures by the governments. Additionally, increased education expenditures in the households after women's empowerment through employment supports these assumptions regarding the priority of investment in child-care services.

Furthermore, the declining fertility rate of working women may have implications for the policy design in multiple stages. Firstly, the lower fertility rates indicate lower population growth and youth population rate, which would result in an older society structure. As the share of the elderly expands, investments in health care services can be expected to rise. Therefore, the effect of a higher female labor participation rate may require more public investment in health indirectly. On the other hand, if the aforementioned U-shaped relationship between fertility and female labor force participation rate is overriding, the expected spending on health care services might be more complex than assumed. If society internalized the normality of working women and provided the necessary resources to have children without compromising their careers, higher fertility rates would offer a younger population in the long run. However, providing necessary resources would also require public investment in education expenditures by the governments. Contrarily, if society could not normalize working women, the fertility rates would remain lower, and the population would end up being older, requiring higher health investments as discussed above. Tridimas and Winer (2005) suggested that the increased labor force participation of women was one of the main drivers of increased government spending in the U.S., which is in line with the expectations of this study. Even so, the obscurity of the association between female labor force participation rate and the share of government spending on education and health in GDP forces a need for exploring the subject.

2.3 Female Participation in Politics

Political representation can be deemed one of the most potent ways of empowering women. Although the majority of countries agreed upon reaching gender parity by 2030 under the Sustainable Development Goals, most of them are far behind the targets, and women remain the minority in the decision-making processes at all levels (UN, 2020). In addition to being a great tool to ensure female empowerment, the higher political representation of women has various other benefits revealed in many studies. A study (Clots-Figueras, 2012) conducted in India demonstrated that the probability of attaining education was higher in urban areas where females

are represented politically. Similarly, higher educational attainment and enrollment were observed when the female leaders participated more in the governmental bodies (Beaman et al., 2006; Clots- Figureas, 2012; Hessami & Fonseca, 2020). In addition to the direct results observed in educational attainment through women’s political involvement, female politicians have been proven to lean toward increased educational spending in numerous studies (Svaleryd, 2009; Clots-Figures, 2010; Baskaran et al., 2018, Geys & Sorensen, 2019; Bagues & Campa, 2020).

Moreover, gains from the higher presentation of women in politics are not limited to educational preferences and higher investments in education expenditures. Priyanka (2020) stated that the growing number of female politicians influenced the labor market through two separate channels. Firstly, the politicians provided more public goods that targeted increasing the labor markets for women. Secondly, they acted as role models for other women, encouraging them to take part in the labor force in India between 1980 – 2007. Likewise, other studies also put forth that female politicians provided essential public goods that would enable women to participate in the labor force more (Ghani et al., 2013), and they affected the social norms in a way that would promote greater engagement in the work-life for women (Deininger et al., 2022). Additionally, female politicians are observed to be more concerned with the problems experienced mainly by women (Thomas, 1991; Case, 1998; Chattopadhyay & Duflo, 2004; Bagues & Campa, 2020) and with the laws on abortion and childcare (Berkman & O’Connor, 1993; Hessami & Fonseca, 2020). Another apparent divergence in political preference between female and male politicians is regarding the government size; both Alvarez and McCaffery (2003) and Casarico et al. (2019) reported that women leaders prefer larger governments through higher social spending. Finally, one more crucial impact of female politicians is on health expenditures. Studies conducted in various countries revealed that female politicians report a higher preference for health expenditures compared to their male counterparts (Clots-Figureas, 2010; Baskaran et al., 2018; Geys & Sorensen, 2019).

Under the median voter theorem, politicians would try to take a median stance to capture the most support from the voters as it will minimize the distance from the preferred policies for the whole group of voters, and the winning candidates will have the vote of the median voter (Congleton, 2004) model, the identity of the politicians is not very important as regardless of their identities, they will target the median voter’s preferences. Nevertheless, many studies presented here suggest that the politicians’ identity (gender in this case) matters as the female politicians’ priorities for the appropriate policy design differ from male politicians’ leanings. Given the fact that female leaders tend to express their desire for larger governments through higher social spending, increased education and health expenditures, and equal distribution of resources (Andersen et al., 2008), the existence of a relationship between the share

of females in the parliaments and the government spending on education and health as a percentage of GDP can be expected. The possible association between the two variables demands more attention and in-depth analysis as it would have profound policy implications for the governments in many countries.

2.4 Female Preferences

The identity and preferences of the politicians may affect the resulting policies and political atmosphere of a country. On the other hand, the median voter model mentioned in the previous section is not a concept to be disregarded. Hence, the priorities of the voters are expected to have a significant influence as well since the politicians will try to gain their votes by designing policies close to the voters' preferences. In this regard, it can be beneficial to consider the leanings and behavior patterns of the women voters as they are proven to be considerably different than men. Edlund et al. (2005) stated that the lower marriage rates turned women to take a more leftist stance, and this relationship was driven mainly by the preference for redistribution of the resources for the children's education. Another study by Lott and Kenny (1999) demonstrated that single mothers who had to raise their kids by themselves reported that they vote for the more liberal and democrat candidates. Interestingly, being divorced or a single mom is not even necessary for the turning political position of women. Edlund and Pande (2002) revealed that even the increased incidence of divorce was enough, especially for the working middle-income women to become more leftist. This can be interpreted as women's desire for larger governments as the leftist governments are observed to be larger, mainly due to increased social public spending (Liston-Heyes & Ceton, 2007). As the heavier consequences of divorce are experienced more by women, demand for more redistributive and larger governments is understandable from the women's perspective. From this train of thought, Aidt and Dallah (2008) investigated the relationship between women's suffrage and government expenditure, which revealed a positive association for the examined sample of countries (Norway, France, Denmark, the United Kingdom, Sweden, and Belgium). Additionally, a similar pattern where the suffrage of women was followed by higher government expenditure was observed in the U.S. (Lott & Kenny, 1999). Miller (2008) reported that women's suffrage in the U.S. also influenced the health spending for children at the national level.

The difference between the economic and political behavior of women and men is apparent at the macro-level and within a household. This micro-level variation implies a requirement for diverse policy designs. For instance, a transfer payment called PROGRESA, given to the families below a poverty cutoff, was made directly to the women so that they could control how to spend the money within a household.

Rubalcava et al. (2009) tracked how the given payment was consumed and reported that when the women have the decision-making power over this additional income, they tend to spend it more for the future of the children and purchase of livestock, which was used as a better nutrition source for their children. Furthermore, another study demonstrated that each additional unit of income was spent towards the needs of the children when the mothers controlled it; however, it was spent on adults when the control over the payment was in the hands of the fathers (Lundberg & Pollak, 1996). Similarly, Phipps and Burton (1997) considered the Canadian population and stated that each additional income was spent on children-related expenditures when the wives made the spending. On the contrary, it was spent on transportation costs when it was made by the husbands of the households. In line with these findings, Morrison et al. (2007) presented that in both developing and developed countries, when the resources are in the control of the women in a household, they are used for the education of the children and the health of the family members. When the relationship between the received education and income inequality is considered, women's tendency for increased spending on education becomes even more critical. Higher education spending is found to be decreasing inequality within a society in a repeated set of studies (Gerhard & Ravikumar, 1992; Flug et al., 1998; Yang & Qiu, 2016; Coady & Dizioli, 2018).

Moreover, a very large scaled and detailed study (Falk et al., 2018) focusing on the social preferences of the participants using data from 76 countries revealed that women are found to be more altruistic, trusting and risk avoidant, although they are found to be more impatient. These findings are extremely important for providing information to the current study. As the government spending on education, health and environmental protection can be considered as investments that benefit the society beyond the individuals, altruistic inclination of women might be echoed as increased demand for public expenditures in these areas.

To summarize, as women take a more active place in politics through increased education levels, labor force participation rate, and political representation (both as politicians and voters), their preferences are more likely to be voiced and reflected in the policy designs. As presented in this section, women's priority is increased education and health spending. Additionally, as women are considered more patient and altruistic than men, in societies where women are empowered, it is hypothesized that the long-term public expenditures (education and health spending in particular) by the governments would increase significantly. Therefore, the relationship between the females' participation in the labor force, their education levels, political representation, and the share of government spending on education and health in GDP will be investigated in the next section.

Chapter 3

Data

The panel data analysis focused on the 38 OECD countries between the years 1950 to 2021 whenever the data were available (see Appendix A). As a way of reflecting the level of women empowerment in a given country, female participation in the labor force, education, and politics are used as independent variables. Share of government spending on education, health, and environmental protection in GDP are used as the dependent variables. Models are controlled for the unionization levels, bargaining power of the workers, youth population, elderly population, population growth rate, GDP per capita, human development index, and communist history of the countries. The descriptive statistics for the variables used for this study are presented in Table 3.1. Further definitions and details of all the variables used in this study can be found in Appendix B.

Table 3.1: Descriptive summary statistics.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Country ID	2,736	19.50	10.97	1	38
Year	2,736	1,986	20.79	1,950	2,021
GDP per capita	1,742	23,203	17,570	600.5	136,240
Education Spending Share	783	5.348	1.012	3.130	7.807
Health Spending Share	783	6.025	1.564	1.334	9.354
Environmental Protection Spending Share	783	0.700	0.320	-0.258	1.779
Government Spending Share	783	43.685	7.655	20.996	65.227
Co2 Emission	2,032	8.124	5.462	0.356	40.59
Female Parliamentarian Share	902	24.34	10.85	2.364	48.33
The Gini Index	391	0.314	0.0543	0.220	0.494
Female Labor Force Participation Rate	1,178	51.36	8.449	23.18	73.74
Female Graduate Share	255	58.89	4.970	46.21	69.72
Bargaining Power	574	50.82	33.49	0.700	100
Unionization Density	667	27.97	20.80	4.500	93.30
Female Tertiary Education Share	914	29.18	13.03	2.858	66.45
HDI	1,140	0.842	0.0733	0.583	0.957
Ex-Communist Ideology	2,736	0.211	0.408	0	1
Youth Population Share	608	24.90	4.903	17.82	40.26
Elderly Population Share	2,698	11.60	4.432	2.868	28.79
Population Growth Rate	2,279	0.808	0.853	-2.574	6.017
Inflation Rate	912	3.043	5.221	-4.478	84.641

3.1 Dependent Variables

Government size is an important indicator as the preference difference between the gender are proven to be quite divergent. Government spending as a percentage of GDP retrieved from the OECD database was used. The data are available from 1970 to 2020; however, it goes back for that long only for two countries (South Korea and the United States). Hence, the analysis was limited to the years between 1995-2019 as it ensured the availability for most countries with six exceptions. Data for Australia and Iceland are available from 1998, 2013 for Chile, 2009 for Colombia, 2012 for Costa Rica, and 2005 for Japan. This variable included the government expenditure for recreation, culture and religion (RECULTREL), housing and commodity (HOUCOMM), public order and safety (PUBORD), educa-

tion (EDU), defense (DEF), economic affairs (ECOAFF), environmental protection (ENVPROT), general public services (GRALPUBSER), health (HEAL) and social protection (SOCPROT). It was available in thousands of USD per capita and as a percentage of GDP, and the percentage of GDP is used for adjusting to the cross-country size variation. However, it included other entries that no effect of female empowerment is expected, and as a result, it is decided to continue with the items that are actually hypothesized to be related.

Consequently, government spending on education, health, and environmental protection variables are used for the analyses separately as the dependent variables since they are considered to be long-term investments by the governments for this study. Government spending on education, health, and environmental protection data are obtained for 1995-2019. However, the data are missing for four countries (Canada, Mexico, New Zealand, and Turkey). Additionally, data for Australia, Iceland, Chile, Colombia, Costa Rica, and Japan are available for the same years as indicated for the general government spending.

3.2 Independent Variables

Female empowerment can be ensured through increased workforce participation as it will allow women to have economic freedom; through providing higher levels of education, as it will result in more informed and productive women seeking employment; lastly, through political representation, as it will enable women's priorities to be heard both as voters and politicians in the policy design processes as well as functioning as role models for the women in the society.

For these purposes, the female labor force participation rate, which is defined as the proportion of the total female labor force to the total female working-age population, is collected from the World Bank database for the years 1992 to 2020, and the dataset was complete for all years and countries concerned. The average female labor participation rate was the lowest for Turkey with an average of 29% and the highest for Iceland with an average of 71%.

The education level of women can be approximated through several indicators, and two of them are selected for the purposes of the analysis. The explanatory power of the variables is compared to decide which one to use. Firstly, the share of females who obtained a bachelor's degree among all people obtaining a bachelor's degree is considered for the years between 2013 and 2019 (inclusive). The world average for each year fluctuated between 58.6% and 59.3%, reflecting the fact that female students comprise the majority of the graduates at the bachelor's degree level. Secondly, adult education level data broken down by gender are used. The share of females who are above 25 years old and completed tertiary education in the

population of all females above 25 years old is selected and defined as the tertiary education share for the females. The data for the years between 1981 to 2020 are obtained whenever possible for 38 OECD countries from the OECD database (there are various discontinuities in the dataset for most of the countries, and in order to take full advantage of the dataset, all points available are included in the analysis). Since the focus is the empowerment of women, the first variable concerning the ratio of women graduates to all bachelor's degree graduates is expected to reflect the opportunities presented for women in a better way; hence, the explanatory power of the variable is anticipated to be higher for the purposes of this study.

Lastly, the representation level of women in the parliaments is included as it is expected to influence the policy-making for most countries by speculating women's demands and preferences at the governmental level. The share of women parliamentarians is defined as the ratio of females to all parliamentarians in a country's single or lower chamber. The data are obtained from the database of the World Bank and are available between 1997 and 2020 for all the 38 OECD countries in the sample. The lowest historical average is observed for Japan (8.5%), Turkey (9.8%), and Hungary (9.9%). In comparison, Sweden (44.7%), Finland (39.9%), and Norway (38.4%) are the countries that are closest to reaching parity in their parliaments.

These variables are considered as a tool to measure the women's empowerment supplied by 38 OECD countries. It is expected that the higher empowering opportunities presented for women will ensure that the preferences of women will influence the size and composition of the government spending in a way that the influence will be the most apparent for long-term investments such as education and health spending by the governments.

3.3 Control Variables

The participation rate of women in the labor force, education, and parliaments are expected to be correlated with the government expenditures on education and health as a percentage of GDP. However, the panel of 38 countries between 1950 – 2020 requires the inclusion of several controls to understand better the relationship between the dependent and independent variables introduced in the previous sections.

Firstly, the variation of GDP per capita between the countries and the years is non-negligible. For instance, the lowest GDP per capita observed in the sample is recorded in 1970 for South Korea at around \$600. On the other hand, the highest amount belongs to Luxembourg in 2021 with \$136,240. Hence, control variables of GDP per capita and its square are included in the analysis to capture this variation. The data from 1960 to 2021 are retrieved from the OECD database; although the complete data for each country started in 1995, previous years are also included for

the available countries to increase the observations in the analysis.

Another factor that could influence the government size is the unionization of the workers in a given country. Marlow (2012) revealed that the higher unionization for the public workers is associated with larger government sizes. Therefore, two separate variables to capture the level of unionization and bargaining power are included in the analysis as the control variables. The first one focuses on the bargaining power of employees and is defined as the percentage of the employees with a right to bargain. The dataset obtained from the OECD Statistics database covered the years between 2000 through 2019. Although it has interruptions, it is treated as a valuable source of information and used as an alternative for the second control variable to capture the unionization levels, called the trade union density. This second control variable of unionization is outlined as the number of union members over the number of employees while excluding unemployed, self-employed, and out-of-labor-force workers. It is expected to work better as the definition is more precise and reflects the information that the analysis is more concerned with. Similarly, the data coverage is between 2000 and 2019; however, it is more complete and provides more data for each country compared to the bargaining power control.

Another critical difference between the countries in the sample is the communist backgrounds of eight countries (see Appendix C). Hence, a dummy variable reflecting the socialist/communist ideological history of the countries is also added to the regressions as in line with the design of Stockemer (2017). The ex-communist country dummy takes the value of one if the country comes from a communist ideological background and zero otherwise. However, due to time invariant nature of this dummy variable, a multicollinearity problem is observed. After the initial analyses conducted with this variable, it is observed that excluding this variable does not cause a substantial change. Hence, the variable is excluded from the main analyses studied.

Human Development Index (HDI) can be deemed as another factor that varies considerably between countries and years. HDI is designed to exhibit the multi-dimensional structure for evaluating the development levels of the countries rather than focusing only on the economic growth of a nation. It is an index comprised of life expectancy at birth for approximating the health dimension, mean years of/ expected years of schooling for estimating the education dimension, and lastly, gross national income per capita to communicate the living standards of a country (UNDP). The data are obtained from the United Nations database for the years between 1990 and 2019.

Lastly, demographic controls are added to the model as they are expected to alter government spending on education and health significantly. For the youth population, the percentage of the population aged between 5-24 is used in order to

understand their effect on education and health expenditures. It is expected that the youth population would be positively correlated with the education spending as they are the population strata that needs the educational investment the most. The data are accessible for the years between 2005 and 2020. While Japan has the lowest youth rate with 18.8%, the youth comprises the largest share of the population for Mexico with 37.4%. On the other hand, the percentage of the population aged over 65 is utilized to understand the effect of the share of the elderly population on government expenditures for health and education. The data for the elderly population are considered for the years 1950 to 2020. Historically, the lowest average of the elderly population belongs to Mexico (4.4%), while the highest is observed in Sweden (15.7%). However, when the average for the last 20 years is discussed, although Mexico remains the one with the lowest (6.2%), Japan (23.3%) becomes the country with the largest elderly population share. It is presumed that countries with a larger percentage of the elderly population would need higher investment in health and lower investment in education when the priorities of the age groups are taken into account. The final demographic control variable is the population growth rate, which is included to capture better the association between the demographic structure of the countries and the expenditures of the governments. The population growth data between 1951 and 2020 are included in the models as another control variable. The share of youth and elderly population data are obtained from the OECD database, population growth rate is retrieved from World Bank database, and provided completely for each OECD country and years specified previously.

Inclusion of the control variables is essential to comprehend the actual dynamics of the variables of interest, as excluding them might create artificial and exaggerated links between the explanatory and dependent variables.

3.4 Variables for the Additional Analysis

After completing the analyses regarding the relationship between the women empowerment variables and the share of government expenditure on the long-term investments, such as education, health and environmental protection, in GDP, additional analyses are considered.

The Gini Index is used to reflect the income inequality as the independent variable. The data used are for the years between 2004 - 2019. The Gini Index takes values between 0 and 1, the less the income inequality, the closer index gets to value of 0 and vice versa. Out of all OECD countries, Costa Rica has the highest historical average with 0.48 which makes it the country with the most income inequality observed while Slovenia's historical Gini Index average is the smallest with 0.24.

The independent variables for the analysis are the same as before; the share of

female labor force population to the female working age population (female labor force share), ratio of female bachelor's degree graduates to all bachelor's degree graduates (female graduate) and the share of seats held by female politicians in the parliament (female parliamentarian share).

Lastly, several control variables are added to the analyses in changing orders. Following the work of Jauch and Watzka (2016), GDP per capita, the square of GDP per capita, the inflation rates and the share of total government spending in GDP are used as the control variables. Including both GDP per capita and its squared values is crucial at first as Kuznet (1955) proposes that the relationship between economic development and income inequality is non-linear. Instead, he suggests that as people migrate from rural to urban, meaning that the economy starts to develop, income inequality is expected increase. On the other hand, as the urbanization is completed, income inequality will fall with the accompanying higher growth of the economies. Hence, in order to capture the non-linear relation, both variables are added in the first stage. Moreover, the inflation rate control variable is reasoned by Jauch and Watzka (2016) through the fact that higher inflation levels benefit the debtor even though the poorer people are less protected against the negative influence of inflation. Similarly, they suggest that the effect of government spending share in GDP might be unclear on income inequality as the larger governments may reflect either the lobbying efforts of the elite groups or the social redistributive nature of the government.

On top of the aforementioned control variables, trade unionization density and HDI controls are also added in several models. The impact of trade unionization density is expected to be negative on income inequality since it will allow for collective bargaining and hence, higher unionization will protect the rights of workers ensuring a more equal distribution of the added value. Similarly, HDI and income inequality is expected to be negatively correlated.

The exact models to be considered are presented in the next chapter in detail with their results revealed in Chapter 5.

Chapter 4

Methodology

In this section, the methodology for examining the relationship between female empowerment and long-term government spending will be discussed in detail. Panel data regression will be conducted with 38 cross-sections (countries) and 73 years (1950-2021). A simple panel data regression model can be constructed as follows:

$$y_{it} = \alpha + \beta_1 X_{1,it} + \dots + \beta_k X_{k,it} + u_{it} \quad (4.1)$$

where the i subscript denotes the id of a country, t subscript denotes the time series and k represents each explanatory variable.

$$u_{it} = \mu_i + v_{it} \quad (4.2)$$

is the error term where μ_i reflects the unobservable country-specific effects and v_{it} contains the remaining disturbances in the regression.

In this study, the data will be analyzed with random effect (RE) and fixed effect (FE) models. Under the FE model, v_{it} are assumed to be independently and identically distributed (IID) while μ_i are supposed to be fixed parameters to be estimated. The assumption for this model is that $X_{k,it}$ are independent of v_{it} for all i and t (Baltagi, 2008). For this model, the intercept α is unique for each cross-section (in this case, for each country).

One major disadvantage of the FE model is the loss of degrees of freedom due to the large number of parameters to be estimated. On the other hand, this high level of loss of degrees of freedom can be prevented if it is assumed that μ_i are also distributed IID, and independent of v_{it} . This model is called the RE model as the parameters for the country-specific effects are accepted to be random. Both RE and FE regressions are run for each model and the Hausman test is utilized to decide whether to use FE or RE model.

Various regressions are run using a different set of variables for this study. As indicated in Chapter 3, there are two variables selected for reflecting the education

attainment of females: the share of female graduates with a bachelor's degree out of all bachelor's degree graduates (*fembac*) and the ratio of females who had tertiary education to the all female population aged over 24 (*femedutert*). In the preliminary analyses, it is realized that *fembac* variable has more explanatory power and offers more meaningful results. Similarly, there are two variables to understand unionization, one is called bargaining power which is defined as the share of employees with the right to bargain (*barg*) and the other one is the trade unionization density which provides the ratio of union member workers to all workers (*tradeun*). The second variable is defined in a more understandable and clear manner, and the preliminary regression results offer similar outputs. Lastly, three variables are used for defining the population structure of a country, the share of youth (*youth*) and elderly (*elder*) population, and the population growth rate (*popgrowth*). The use of the first two demographic controls yield comparable products. As a result, only the models containing the variables *fembac*, *tradeun*, *youth* and *elder* are presented here to avoid listing an overwhelming amount of regressions in the following sections.

4.1 Education Spending

The most basic model for exploring the relationship between the female empowerment variables and the government spending on education uses only the GDP per capita control and can be constructed as follows:

$$gseduc_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + u_{it} \quad (4.3)$$

Another model that includes the additional controls of HDI and unionization density of the countries can be written as:

$$gseduc_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_2 hdi_{it} + \gamma_3 tradeun_{it} + u_{it} \quad (4.4)$$

If the model of interest is controlled only for the demographic structure, the new model can be presented as:

$$gseduc_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + u_{it} \quad (4.5)$$

Lastly, a model that involves all the control variables considered up to this point

is investigated:

$$\begin{aligned}
gseduc_{it} = & \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \\
& \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + \\
& \gamma_4 hdi_{it} + \gamma_5 tradeun_{it} + u_{it} \quad (4.6)
\end{aligned}$$

Each model is run using FE and RE models and a Hausman test is carried out. Only the preferred models by the Hausman test will be discussed in Chapter 5.

4.2 Health Spending

Government spending on health and education seems to be in line with each other, meaning that the same controls can be used. Again, the demographic controls are helpful to have a deeper understanding as they may be influential to alter the composition and size of the expenditures on health and education. Health spending of the government can be also considered as social spending, hence the influence of HDI and unionization are still relevant as the control variables. Thus, the same four models presented in the previous section will be employed and government spending on health will replace the government spending on education as the dependent variable. The counterparts of the models (4.3), (4.4), (4.5) and (4.6) are constructed respectively as follows:

$$gsheal_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + u_{it} \quad (4.7)$$

$$\begin{aligned}
gsheal_{it} = & \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \\
& \gamma_1 gdppc_{it} + \gamma_2 hdi_{it} + \gamma_3 tradeun_{it} + u_{it} \quad (4.8)
\end{aligned}$$

$$\begin{aligned}
gsheal_{it} = & \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \\
& \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + u_{it} \quad (4.9)
\end{aligned}$$

$$\begin{aligned}
gsheal_{it} = & \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \\
& \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + \\
& \gamma_4 hdi_{it} + \gamma_5 tradeun_{it} + u_{it} \quad (4.10)
\end{aligned}$$

Although health spending is considered as a long-term government expenditure for this study, the relationship is not expected to be as strong and significant as

the outcomes from the education spending regressions. The reason for this lower impact relationship expectation is the fact that health expenditures also include short-term investments where the increased spending is a response to the current health situation, while the preventive health expenditures are considered to be long-term investments of the governments. As the data for government spending for preventive health measures could not be reached, general health spending shares of the governments are used. Thus, the time preference of the empowered women may not be translated into a demand for increased health expenditures, at least not at the similar levels as it is expected for the education expenditures.

As it was the case for the regressions presented in the education section, these regressions are also run with RE and FE models and the Hausman test is applied. The results for the regressions are presented only for the models preferred by the Hausman test in the next chapter.

4.3 Environmental Protection Spending

Environmental protection expenditures can be viewed as another long-run investment made by the governments. Although the impact of the increased investment in environmental protection can be observed immediately depending on the kind of initiative, the influence tends to benefit society in the long term as well. Hence, it can be hypothesized that the patience of the females can be noticed in the relationship between female empowerment and the spending on environmental protection by the governments. However, the control variable unionization density will not be involved in this analysis as it is not expected to make a difference in the governments' willingness to spend on environmental protection. On the other hand, HDI and population structure controls will be kept.

Although the expenditures on environmental protection are not part of the main hypothesis exhibited in this study, the association will still be examined to have a further understanding of the topic.

In accordance with the models presented in the previous sections of education and health spending, the models investigating the effect of female empowerment on government spending for environmental protection will be listed respectively. Firstly, the most basic model involving only the GDP per capita control can be constructed as follows:

$$gsenvpro_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + u_{it} \quad (4.11)$$

Later, the HDI control will be added, and the model becomes:

$$gsenvpro_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_2 hdi_{it} + u_{it} \quad (4.12)$$

When the demographic controls are employed rather than the HDI variable, the new model can be written as:

$$gsenvpro_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + u_{it} \quad (4.13)$$

Lastly, the model that encompasses all the controls selected for studying the influence that empowered women have on the environmental protection expenditures of the governments is presented:

$$gsenvpro_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_2 youth_{it} + \gamma_3 elder_{it} + \gamma_4 hdi_{it} + u_{it} \quad (4.14)$$

As mentioned at the beginning of this section, the models presented for the environmental protection expenditures of the governments are not the focus of this study, but rather, the topic will be discussed as a piece of supplementary information to interpret the outputs of the main models. In the same manner of the previous sections, all the regressions are evaluated using FE and RE models and the appropriate one is chosen according to the Hausman test results.

4.4 Income Inequality

Access to the higher levels of education and health are expected to be reducing the income inequality. As people get education, they will gain important skills for the job market and they will demand higher wages as their valuable skill set is expanded. Hence, it is essential for all of the population to receive quality education. Additionally, providing health services to all is another factor that would have an influence on the income inequality in a negative way; meaning that as health services are provided more, income inequality is expected to fall. Although the effect of these two factors on income inequality can be observed in a more immediate manner, the effect of increased share of government spending for environmental protection in GDP can be considered as a more long-term outcome because investing in environmental protection does not only benefit the current population but also it has advantages for the future generations. Therefore, increased share of environmental protection

spending of the government in GDP can also be reflected as less intergenerational inequality.

As the effect of female empowerment on the ratio of government spending on education, health and environmental protection to the GDP is expected to be positive, it can be concluded that there might be a correlation between the female empowerment variables (female labor share, female graduate share and female parliamentary share) and the income inequality (the Gini Index).

The first model that includes the control variables DGP per capita and its square, the inflation rate and the share of total government spending in GDP is presented as follows:

$$gini_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_1 gdppcsq_{it} + \gamma_2 inf_{it} + \gamma_3 gstot_{it} + u_{it} \quad (4.15)$$

Later, HDI control variable is added to the model to have a better understanding of the relationship:

$$gini_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_1 gdppcsq_{it} + \gamma_2 inf_{it} + \gamma_3 gstot_{it} + \gamma_4 hdi_{it} + u_{it} \quad (4.16)$$

The last model that includes all the control variables found appropriate to examine this expected relationship can be constructed as follows:

$$gini_{it} = \alpha + \beta_1 femlab_{it} + \beta_2 fembac_{it} + \beta_3 wps_{it} + \gamma_1 gdppc_{it} + \gamma_1 gdppcsq_{it} + \gamma_2 inf_{it} + \gamma_3 gstot_{it} + \gamma_4 hdi_{it} + \gamma_5 tradeun_{it} + u_{it} \quad (4.17)$$

It is expected that as the female labor share, female graduate share and share of female parliamentarians rise, the Gini index will be smaller, reflecting less income inequality.

As discussed before, the direction of the expected correlation between the inflation rate and the Gini index is ambiguous. While economically more advantages people might have better access to financial markets and therefore can safeguard themselves better for the adverse effects of higher levels of inflation, it may also benefit them as debtors. This is because the unexpected inflation will reduce the amount of payment made in real terms. Hence, although the direction is not known and predicted beforehand, it is important to incorporate it to the model to control for the possible relation.

Similarly, the effect of the share of total government spending in GDP is expected

but which way the relationship goes needs further investigation.

Lastly, higher HDI and trade unionization density are expected to reduce the income inequality hence causing lower levels of Gini Index. As a result, a negative correlation is expected from this association.

For all the models considered here, both FE and RE regressions are run and the more appropriate model is chosen according to the results of Hausman test. Additionally, only the chosen regression models will be shared in the next chapter and the results will be discussed in detail.



Chapter 5

Results

The results of the regressions introduced in Chapter 4 will be discussed in detail in this chapter. As mentioned before, both RE and FE models are used for every regression to explore the relationship between the female empowerment variables, and the long-term government spending variables while controlling for GDP per capita, HDI, unionization density and the demographic structure of the countries. The results for each dependent variable will be presented in separate sections.

5.1 Education Spending Results

Education spending can be considered as one of the main spending items for the governments thought as a long-term investment as the population group benefiting from this investment will manifest the gains that are obtained through receiving education after they complete their education and join the workforce. Women in the households reveal their preference for increased education investment through higher levels of education spending for their children while the women that take part in politics communicate their tendency to prioritize the investments made to the education sector by proposing the topics related to education for the agenda.

Four models regarding education spending that are previously elaborated on are examined. Both RE and FE models are run for each model, and the Hausman test results suggested the usage of the FE model (all $p < .05$). The results are presented in Table 5.1 and as the government spending on education data for four countries mentioned in section 3.1. are missing, the analysis is limited to 34 OECD countries.

The results in column (1) refer to the model (4.3), which is the most basic form for exploring the relationship between the female empowerment variables and the government spending on education while controlling for GDP per capita of the countries. When column (1) is examined further, it can be realized that the female labor participation and graduation rates are significantly and positively correlated with the government expenditure on education, while the share of the seats occupied by

Table 5.1: Results of education spending regressions.

VARIABLES	(1) Education Spending FE	(2) Education Spending FE	(3) Education Spending FE	(4) Education Spending FE
Female Labor Force Participation Rate	0.057** (0.024)	0.012 (0.024)	0.036 (0.024)	0.005 (0.024)
Female Graduate Share	0.031* (0.017)	0.030* (0.017)	0.032** (0.016)	0.029* (0.017)
Female Parliamentarian Share	0.008 (0.006)	0.000 (0.006)	0.007 (0.006)	0.003 (0.006)
GDP per capita	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
HDI		19.454*** (4.413)		16.981*** (5.697)
Unionization Density		0.055*** (0.014)		0.043*** (0.016)
Youth Population Share			-0.213*** (0.044)	-0.094 (0.059)
Elderly Population Share			-0.101** (0.041)	-0.073 (0.056)
Constant	1.483 (1.658)	-14.414*** (3.932)	9.203*** (2.229)	-8.218 (6.144)
Observations	224	182	224	182
R-squared	0.275	0.454	0.359	0.465
Number of countries	34	34	34	34

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

women parliamentarians does not demonstrate a significant relationship. It can be understood that a 1% increase in the labor participation rate of women is accompanied by a 0.057% rise in the share of education expenditure in GDP. Similarly, a 1% improvement in the share of females in all bachelor's degree graduates is reflected as 0.031% higher share of government spending on education out of GDP. Although GDP per capita seems to be negatively affecting the share of education spending on GDP, the impact is relatively diminutive (-0.0000326%). One reason for the negative impact can be thought of as the already high levels of education investments in countries with high GDP per capita. As the GDP per capita rises, the additional income can be transferred to other expenditures which would result in a lower share of education spending as it is expected to be high, to begin with.

In the second column, the results belonging to the model (4.4) under FE are presented. When the controls for HDI and the unionization density are added, the significant influence of the female labor participation rate diminishes, while the female graduate rate remains to be positively affecting the education spending of the governments at a similar level with its effect in the first model (0.030%). It is important to note that HDI takes values between 0 and 1. Hence, the coefficient 19.454 can be interpreted as follows: a 0.1 increment of improvement in the HDI is attached with a 1.95% rise in the share of education expenditure in GDP. This is indeed expected, as a large portion of the HDI includes the expected education levels of the individuals in a given country. Additionally, a positive correlation appears between the unionization density and the education spending share, and 1% higher unionization is expected to result in 0.055% more education spending share.

The third model (4.5) for education spending can be considered as one of the most interesting results of the study. Although female parliamentarian share and the female labor participation rate are insignificant in the model, education of women continues to affect education spending at similar levels (0.032%). On the other hand, the share of the youth population is observed to have a negative impact on education spending, which is one of the most unexpected outcomes revealed by this study. One possible explanation for such a result can be the long-term nature of education spending. The youth population defined in this study refers to individuals who are already of educational age. Hence, when the investment in education pays off, they might no longer be a part of the youth population. Examining the lags of education spending share variable or the newborn population share might have been a better approach to understand the demographic effects. On the other hand, the negative correlation between the share of the elderly population and education spending share is expected as they are not at their reproductive or educational ages. Thus, it is anticipated that if the share of the elderly population is higher, the investments undertaken for education can be smaller as the population is older.

Lastly, when all the control variables are included as presented in the last column for the model (4.6), the significance of the demographic controls diminishes. Additionally, it is observed that the within R-squared are higher for all models compared to between R-squared. This finding suggests that the relationship between the variables are driven mainly by the time-series effects rather than cross-country relationships. The higher impact of the time-series indicates that the cross-country variation is too high to drive the observed relationship. Hence, the within R-squared values are reported in Table 5.1. Nevertheless, the R-squared is fairly high in all models as lower R-squared values are common for the panel data analysis. Therefore, it can be concluded that the explanatory power of the variables selected for the analyses is shown to be well.

5.2 Health Spending Results

Health spending can be divided into two groups; one part of spending focuses on the preventive measures, including research and development costs while the other part can be classified as more reactive expenditures that are made as a response to developments in the health system, global issues (e.g. Covid-19) etc. Investments made for the preventive measures can be viewed as longer-run expenditures. Hence, the time preference of empowered women is expected to be realized as a rise in share of health spending in GDP. Women who could access to higher levels of education are anticipated to be more aware and knowledgeable for health related issues. Thus, their taste for provision of better health services and preventive measures combined with their time preference (patience) is expected to be observed as higher ratio of health spending of the government to GDP. Similarly, women who take part in the labor force are assumed to demand public spending for health, and this prioritization is discussed in the parliaments more due to reviving of the issue by the women parliamentarians.

The models that are introduced in the previous chapter are analyzed here and the related output can be found in Table 5.2. As it is the case for the education spending, these models are also explored using FE and RE models. Although FE model is proposed for the education spending, RE is found to be more appropriate for health spending analyses as suggested by the outcome of the Hausman test ($p > .05$).

The results presented in the first column of the Table 5.2. refer to the model (4.7) where only the GDP per capita control is added along with the independent variables for female empowerment. It can be seen that all of the variables used in this analysis yield significant associations with the dependent variable of health spending share in GDP. A 1% labor force participation rate of females is discovered

Table 5.2: Results of health spending regressions.

VARIABLES	(1) Health Spending RE	(2) Health Spending RE	(3) Health Spending RE	(4) Health Spending RE
Female Labor Force Participation Rate	0.093*** (0.025)	0.045* (0.025)	0.066*** (0.021)	0.043* (0.023)
Female Graduate Share	0.066*** (0.018)	0.064*** (0.020)	0.073*** (0.015)	0.058*** (0.017)
Female Parliamentary Share	0.012* (0.007)	-0.000 (0.007)	0.005 (0.006)	0.005 (0.007)
GDP per capita	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
HDI		29.223*** (4.600)		11.993** (5.085)
Unionization Density		0.018* (0.010)		0.027*** (0.010)
Youth Population Share			-0.286*** (0.040)	-0.296*** (0.050)
Elderly Population Share			0.043 (0.037)	-0.030 (0.049)
Constant	-1.973 (1.737)	-24.210*** (4.045)	5.976*** (2.019)	-1.632 (5.021)
Observations	224	182	224	182
R-squared	0.206	0.422	0.551	0.609
Number of countries	34	34	34	34

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

to be accompanied by 0.093% increase in the health spending share. Similarly, a 1% increase in the share of female bachelor's degree holders is reflected as 0.066% more health expenditure share. Likewise, a positive influence of the number of women holding a chair at the parliament on the share of government spending for health in GDP is recognized. 1% increased representation of females in the parliament is associated with 0.012% rise in the share of health expenditures undertaken by the governments. As it is the case in the education spending, the correlation of GDP per capita and health spending share remains to be significant yet minuscule with a coefficient of -0.0000225%.

The second regression result in column (2) which corresponds to the model (4.8) includes the HDI and unionization density controls on top of the female empowerment variables and GDP per capita control. Although labor force participation and bachelor's degree graduation shares continue to be significantly associated with the share of health spending in GDP, the share of seats held by women in the parliament loses its explanatory influence over it and becomes insignificant. It can be realized that the effect of female labor force participation rate falls to 0.045% when the relation is controlled for HDI and trade unionization. On the other hand, the effect of female graduate share decreases slightly to 0.064%. In line with the previous regression, the negative impact of GDP per capita control is observed to be significant but small (-0.0000538%). On the other hand, the positive influence of a 0.1 incremental rise in HDI is expected to yield 2.9% improvement in the share of government health spending in GDP. This relationship can be better understood when the composition of HDI is considered. HDI involves the life expectancy of individuals and if higher HDI is observed, it is natural to be accompanied by higher levels of health spending. Further, a 1% higher levels of unionization density is reflected as 0.018% more share of health spending in GDP. It can be explained through the increased power of the workers in negotiating the terms of their employment. Workers can protect their rights to access health services through organizing and unionization. Therefore, the positive association is not a surprising factor.

Investments for health services by the governments can be better comprehended if the demographic structure of the countries are taken into account. Hence, the third regression concerning health expenditures (4.9) is run and the output of the mentioned regression is presented in the third column of Table 5.2. The relationship between the female empowerment variables and the share of government spending on health in GDP is controlled for the share of youth and elderly population. As it is seen, labor participation and graduates rates for females are still significantly and positively correlated with the dependent variable, while the female politicians lose their explanatory power over it. 1% higher labor force participation rate for women is revealed to be echoed as 0.066% increase in the share of government spending,

while 1% rise in graduation rate is reflected as 0.073% rise. GDP per capita still has a negative significant influence, although it remains to be quite small (-0.0000387%). The interesting part of this analysis can be deemed as the fact that although negative impact of youth population is observed as expected, the anticipated influence of the elderly population does not translate into health spending at a significant level. A 1% larger share of youth population is realized to be 0.286% less share of health spending by government in GDP. This can be explained through the smaller need for making health spending by the governments when the population is younger, as there is less demand for nursing services. Lastly, all the control variables are included in the regression and the results are displayed in the last column of Table 5.2. Similar with other models containing the additional control variables considered here, the rate of labor force participation and graduation of females are still positively correlated whereas the share of female parliamentarians does not have a significant influence on the share of government spending on education in GDP. HDI and unionization density continue to positively impact the dependent variable. On the other hand, the negative influence of youth population share remains in effect even though the elderly population's effect is insignificant. As it was the case in the education spending, the R-squared values reported belong to the within effect, meaning that the cross-country variation is too high and the relationship between the dependent and the independent variables are driven by the time-series effect. Importantly, the values are adequately high for the panel data analysis, indicating the employment of an appropriate model.

5.3 Environmental Protection Spending Results

Environmental spending by the governments can be deemed as long-term investments due to its possible intergenerational impact. Thus, the time preference of women can be influential for the government spending composition regarding the environmental protection. Although the analyses regarding environmental protection are not the focus of this study, it is considered to be beneficial to explore the topic in order to have a deeper understanding with the additional information obtained from this relationship. Each of the regression structures presented in the previous chapter are run under FE and RE models and the Hausman test revealed a strong preference for the usage of RE models. Hence, the results of RE regressions are provided in Table 5.3.

Firstly, the relationship between female empowerment variables and the share of environmental protection spending of governments in GDP are examined while controlling for GDP per capita. The results that can be found in the first column of Table 5.3. indicate that labor force participation of females and GDP per capita are

Table 5.3: Results of environmental protection spending regressions.

VARIABLES	(1)	(2)	(3)	(4)
	Environment Protection RE	Environment Protection RE	Environment Protection RE	Environment Protection RE
Female Labor Force Participation Rate	-0.021*** (0.007)	-0.021*** (0.008)	-0.020*** (0.007)	-0.021*** (0.008)
Female Graduate Share	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)	0.010* (0.006)
Female Parliamentary Share	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)
GDP per capita	-0.000** (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Youth Population Share			-0.045*** (0.014)	-0.044*** (0.015)
Elderly Population Share			-0.045*** (0.014)	-0.047*** (0.014)
HDI		0.345 (1.299)		0.784 (1.503)
Constant	1.429*** (0.517)	1.162 (1.134)	3.087*** (0.700)	2.476* (1.379)
Observations	224	224	224	224
R-squared	0.174	0.171	0.236	0.233
Number of c.id	34	34	34	34

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

the only factors that can be associated with the dependent variable at a significant level.

The negative correlation between labor force participation can be interpreted under the light of increased economic activity of the countries with higher female labor participation rates. Additionally, the share of environmental protection expenditure in GDP is rather small. Hence, it may not be as informative as it is initially thought.

The correlation and significance of the relationship between the variables remain at the similar levels when the model is controlled for HDI, and it is realized that HDI levels of the countries do not have a significant association with the share of government spending on environmental protection, as indicated in the column (2) of Table 5.3.

The output presented in the third column of Table 5.3. corresponds to the model (4.13) and the demographic variables are added as controls on top of GDP per capita control. When the model is controlled for the demographic structure, GDP per capita control loses its significance while the rate of female labor participation continues to be negatively affecting the dependent variable along with the demographic controls of youth and elderly population rates.

When the very last model presented is examined further with GDP per capita, HDI and demographic controls, the graduation rate of females become significant in the relationship with the environmental protection expenditures made by the governments. It can be observed that a 1% increase in the share of female bachelor's degree graduates yields 0.01% rise in the share of environmental protection spending by the government in GDP. The negative influence of youth and elderly population share is still noted.

Similar results are observed in each model and the relatively lower R-squared values suggest that the explanatory power of the selected variables are lower to understand the size of government spending on environmental protection in GDP.

5.4 Income Inequality Results

Income inequality is a problem experienced by all countries and it affects the lives of thousands of people. There are several determinants of income inequality and it is measured in various ways. However, for the sake of this study, the Gini Index is used as the variable to reflect the income inequality.

If the majority of the population has access to higher levels of education, they will be better equipped with the necessary skill sets that would be useful in the job market. This is predicted to rise the wage levels and hence, the lower levels of income inequality might be observed which would be reflected as the lower values of the Gini Index. Similarly, elevated accession to health services is another crucial

factor for lower income inequality. As it is easier for the richer people to receive better health care, it may result in as a widening difference between the people of wealth and the economically more challenged people. Hence, when the share of health spending by countries in GDP increases, it may be observed as better health conditions for the poorer people which results in reduction in the gap. Lastly, there is a naturally existing intergenerational inequality as the limited resources are exhausted without consulting to the future generations that do not exist at the time. Therefore, protection of the environment is essential for ensuring a better future for the people of next generation, so that they can have similar or even better conditions to live in. As a result, it can be expected that the increased environmental spending investments in GDP by the governments might reduce the intergenerational income inequality. As the effect of female empowerment is found to be generally positive on the share of long term investments in GDP by the governments (education, health and environmental protection), it causes a curiosity for whether the female empowerment variables are correlated with income inequality as well.

The models to examine this expected correlation were presented in the previous chapter and the results of the models can be found in Table 5.4. All models are considered under RE and FE; however, Hausman test results suggested the usage of FE model ($p < .05$) and all the presented results belong to the outputs of FE regressions.

First model to be considered is presented in the first column of Table 5.4. This regression corresponds to the model (4.15) and examines the relationship between the Gini index and the female empowerment variables while controlling for GDP per capita, its square to reflect the non-linear relationship as suggested by Kuznet, inflation and the share of total government spending in GDP. Although GDP per capita and its square are revealed to be significant, the effects are minor. A 1% increase in GDP per capita is expected to accompany a 0.00000202 point decrease in the Gini Index while the effect of GDP per capita squared is even smaller. Inflation and the share of total government spending in GDP remained insignificant under this model along with the female empowerment variables. Therefore, when we control for only inflation and the government spending share in GDP are considered, there is no significant relationship observed between the Gini Index and female labor participation rate, female graduate share and female parliamentary share.

HDI is added as an additional control variable to the existing model which corresponds to the model presented as (4.16) and the regressions results can be found in column (2) of the Table 5.4. It can be realized that when HDI is controlled for, GDP per capita and its squared values become insignificant. Likewise, inflation and the share of government spending in GDP continue to be insignificant in the relationship. On the other hand, 0.1 of an incremental increase is predicted to reduce

Table 5.4: Results of the income inequality regressions with respect to Kuznet

VARIABLES	(1) Income Inequality FE	(2) Income Inequality FE	(3) Income Inequality FE
GDP per capita	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
GDP per capita Squared	0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)
Inflation	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Share of Total Government Spending in GDP	0.001 (0.000)	0.001 (0.000)	0.000 (0.000)
HDI		-0.534** (0.222)	-0.392 (0.269)
Unionization Density			-0.000 (0.001)
Female Labor Force Participation Rate	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)
Female Graduate Share	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)
Female Parliamentary Share	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Constant	0.358*** (0.072)	0.777*** (0.188)	0.683*** (0.232)
Observations	188	188	156
R-squared	0.186	0.217	0.124
Number of c_id	33	33	33

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

the Gini Index by 0.05 points. Therefore, it can be concluded that the HDI and the income inequality are negatively correlated; the higher the HDI, the lower the income inequality.

Last model to be considered includes all the control variables and the results in column(3) of Table 5.4. belong to the model (4.17). Interestingly, when the unionization density control is added none of the variables remain significant. All the R-squared values reported are within R-squared as the relationship between the variables are driven by the time series and the variation across countries are too high to be accounted for with the effect of presented variables.

As mentioned before, both GDP per capita and the squared values of it are added as the control variables as Kuznet suggests an inverted U-shaped relation between the development level of the economies and the income inequality experienced by the countries. However, this was driven by the mobilization between the rural and urban parts of the countries. As most of the countries completed their urbanization processes, this U-shaped relation may not be present and it might become more linear. Therefore, the same models investigating the relationship between the Gini Index and female empowerment variables will be reconsidered without the squared GDP per capita control. The related output of the regressions are exhibited in Table 5.5.

The first regression suggests that when GDP per capita, share of total government spending in GDP and inflation are controlled for, the impact of female parliamentary share is significant. A 1% rise in the share of seats held by female politicians in the parliament is accompanied with 0.001 points of decrease in the Gini Index. Hence, the increased political representation of females in the parliament is expected to reduce the income inequality as it can be seen in the first column of Table 5.5. Furthermore, the negative influence of inflation rate on the Gini Index is realized to be negatively significant. A 1% increase in inflation results in 0.002 points of drop in the Gini Index, hence a rise of inflation rate is linked with lower levels of income inequality. this implies that indeed, the advantages experienced by the debtors outweighed the hedging ability of the wealthier part of the population. On the other hand, expansion of the share of government spending in GDP is significantly correlated with higher Gini Index values, meaning that 1% rise in the share of government spending in GDP is followed by 0.001 points of enhancement in the Gini Index. Rise in the general government spending share in GDP results in higher income inequality and this can be explained by the fact that the general government spending does not only include the factors that are beneficial for reducing income inequality but also several other factors are also contained, such as war and defense spending made by the governments.

When the results in column (2) is considered, it can be noticed that the sig-

Table 5.5: Results of the income inequality regressions without Kuznet's hypothesis.

VARIABLES	(1) Income Inequality FE	(2) Income Inequality FE	(3) Income Inequality FE
GDP per capita	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)
Inflation	-0.002** (0.001)	-0.001 (0.001)	-0.001 (0.001)
Share of Total Government Spending in GDP	0.001** (0.000)	0.001* (0.000)	0.000 (0.000)
HDI		-0.695*** (0.193)	-0.526** (0.243)
Unionization Density			-0.000 (0.001)
Female Labor Force Participation Rate	-0.001 (0.001)	0.001 (0.001)	0.000 (0.001)
Female Graduate Share	-0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)
Female Parliamentary Share	-0.001** (0.000)	-0.000* (0.000)	-0.000 (0.000)
Constant	0.338*** (0.074)	0.896*** (0.170)	0.776*** (0.217)
Observations	188	188	156
R-squared	0.136	0.205	0.114
Number of c.id	33	33	33

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

nificance of the inflation disappears as HDI is added to the model. Furthermore, GDP per capita becomes significantly and positively correlated with the Gini Index, meaning that higher GDP per capita is linked with increased income inequality for the sample of countries used in this analysis. As in the previous regression, and probably because of the same reasons, the share of total government spending in GDP is proven to be rising the income inequality marginally through increasing the Gini coefficient for the OECD countries. On the other hand, 0.1 increment of rise in HDI is linked with 0.07 points of decrease in the Gini index, reflecting the relationship that the higher HDI levels are associated with lower income inequality as expected. Lastly, the share of seats held by the female parliamentarians remains to be significantly and negatively correlated with the Gini Index. A 1% expansion results in 0.0004 points lower Gini Index.

Last model to be discussed here is the one with all the control variables mentioned before, apart from the squared values of GDP per capita. Under this model, the significance of GDP per capita, the ratio of government spending to GDP and the female parliamentarian share is lost as the unionization density is controlled for. However, HDI remains to be significantly and negatively correlated with the Gini Index. A 0.1 point of rise in HDI is reflected as 0.05 point lower Gini Index, meaning that the higher HDI is associated with lower income inequality as it was the case in the previous analysis as well. The reported R-squared are within R-squared values since the observed relations are lead by within country variation rather than cross country relations, similar to the previous results.

Chapter 6

Conclusion

Female empowerment is a crucial phenomenon taken seriously by many countries. Increased labor force participation, education attainment and political representation are all the ways that can be used to empower women and make their voices, needs, concerns and demands heard. The importance can be better understood when the differing preferences of men and women are discussed.

Women tend to spend the majority of each additional income obtained for their family, the education and health of their children compared to men. Additionally, women are proven to be more patient, which reflects their time preferences. Furthermore, they are proven to be more altruistic. In the light of these pieces of information, it can be said that they would favor a larger share of government spending to be dedicated to health and education. However, for this demand to be voiced in the policy making processes, it is important that the voter turnout of women to be high so that the politicians will try to gain their votes based on the median voter theorem.

Women who participate in the labor force are more likely to gain economic freedom and become more aware of their options at the political level as well. Similarly, better educated women tend to take an active role in the politics more as voters. Hence, increased educational attainment is another essential tool for empowering women. Direct representation of women in the parliaments as politicians is also crucial because the issues brought to the parliament by women and men politicians are revealed to be significantly different.

Considering these, this study hypothesized that increased female empowerment will be accompanied by larger share of longer-term expenditures by the governments in GDP. More specifically, it is expected that higher female labor participation rate, the share of females among the bachelor's degree graduates and the share of seats held by women in the parliaments will be correlated with higher share of government spending on education and health in GDP. The analyses undertaken show that it is indeed the case most of the time. However, the observed associations are driven by

the effect of time series and they are not as strongly as guided by the cross-country differences since the variation between the countries are too high to be the driving force behind the relationships revealed here.

This study focuses on a sample of OECD countries, and it is encouraged to replicate a similar study with a larger sample of countries to have more generalizability. Additionally, the relationship between the environmental protection spending can be discussed with another variable that can successfully approximate the actual investment made for environment. Lastly, health spending of countries is not entirely a long term expenditure as there is a reactive part of it as well. If data regarding the health expenditures of preventive measures can be obtained, it would ensure a more robust inference for reflecting the time preferences of women. To sum up, further research is needed to understand the correlation between female empowerment and the share of long term government expenditures in GDP.

References

- Adeyem, O. E., Odusina, K. E., & Akintoye, A. E. (2016). Religion and labour force participation in nigeria: is there any inequality among women? *African journal of reproductive health*, 20(3), 75–84.
- Afridi, F., Mukhopadhyay, A., & Sahoo, S. (2016, 12). Female labor force participation and child education in india: evidence from the national rural employment guarantee scheme. *IZA Journal of Labor and Development*, 5. doi: 10.1186/s40175-016-0053-y
- Aidt, T. S., & Dallal, B. (2008, 3). Female voting power: The contribution of women’s suffrage to the growth of social spending in western europe (1869-1960). *Public Choice*, 134, 391-417. doi: 10.1007/s11127-007-9234-1
- Alvarez, R. M., & McCaffery, E. J. (2003, 3). Are there sex differences in fiscal political preferences? *Political Research Quarterly*, 56, 5. doi: 10.2307/3219879
- Andersen, S., Bulte, E., Gneezy, U., & List, J. A. (2008, 5). Do women supply more public goods than men? preliminary experimental evidence from matrilineal and patriarchal societies. In (Vol. 98, p. 376-381). doi: 10.1257/aer.98.2.376
- Andrabi, T., Das, J., & Khwaja, A. I. (2012). What did you do all day? maternal education and child outcomes. *Journal of Human Resources*, 47(4), 873–912.
- Arpino, B., Esping-Andersen, G., & Pessin, L. (2015, 6). How do changes in gender role attitudes towards female employment influence fertility? a macro-level analysis. *European Sociological Review*, 31, 370-382. doi: 10.1093/esr/jcv002
- Atkin, D. (2009). Working for the future: Female factory work and child health in mexico. *Unpublished Manuscript, Yale University*, 2046–2085.
- Bagues, M., & Campa, P. (2021, 2). Can gender quotas in candidate lists empower women? evidence from a regression discontinuity design. *Journal of Public Economics*, 194. doi: 10.1016/j.jpubeco.2020.104315
- Baltagi, B. H., & Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Springer.
- Baskaran, T., Bhalotra, S. R., Min, B. K., & Uppal, Y. (2018). Women legislators and economic performance.
- Beaman, L., Duflo, E., Pande, R., & Topalova, P. (2006). Women politicians, gender bias, and policy-making in rural india.

- Berkman, M. B., & O'connor, R. E. (1993). Do women legislators matter? female legislators and state abortion policy. *American Politics Quarterly*, 21(1), 102–124.
- Casarico, A., Lattanzio, S., & Profeta, P. (2019). Women, local public finance and fiscal adjustment. *Dondena wp*, 133.
- Case, A. (1998). The effects of stronger child support enforcement on nonmarital fertility. *Fathers under fire: The revolution in child support enforcement*, 1, 191–215.
- Cebula, R. J., & Alexander, G. M. (2017, 12). Female labor force participation and voter turnout: Evidence from the american presidential elections. *Review of Economics and Institutions*, 8, 29. doi: 10.5202/rei.v8i2.234
- Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in india. *Econometrica*, 72(5), 1409–1443.
- Clots-Figueras, I. (2011). Women in politics: Evidence from the indian states. *Journal of public Economics*, 95(7-8), 664–690.
- Clots-Figueras, I. (2012). Are female leaders good for education? evidence from india. *American Economic Journal: Applied Economics*, 4(1), 212–44.
- Coady, D., & Diziolli, A. (2018, 5). Income inequality and education revisited: persistence, endogeneity and heterogeneity. *Applied Economics*, 50, 2747–2761. doi: 10.1080/00036846.2017.1406659
- Congleton, R. D. (2004). The median voter model. In *The encyclopedia of public choice* (pp. 707–712). Springer.
- Dang, H.-A. H., & Nguyen, C. V. (2021). Gender inequality during the covid-19 pandemic: Income, expenditure, savings, and job loss. *World Development*, 140, 105296.
- Deininger, K., Jin, S., Nagarajan, H. K., & Singh, S. K. (2022). Addressing declining female labor force participation in india: Does political empowerment make a difference? *Journal of Development Studies*. doi: 10.1080/00220388.2022.2043278
- Dollar, D., Fisman, R., & Gatti, R. (2001). Are women really the “fairer” sex? corruption and women in government. *Journal of Economic Behavior & Organization*, 46(4), 423–429.
- Edlund, L., Haider, L., & Pande, R. (2005). Unmarried parenthood and redistributive politics. *Journal of the European Economic Association*, 3(1), 95–119.
- Edlund, L., & Pande, R. (2002). Why have women become left-wing? the political gender gap and the decline in marriage. *The Quarterly Journal of Economics*, 117(3), 917–961.
- Fafchamps, M., & Shilpi, F. (2011). Education, preferences, and household welfare.
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018).

- Global evidence on economic preferences. *The Quarterly Journal of Economics*, 133(4), 1645–1692.
- Fang, H., Eggleston, K. N., Rizzo, J. A., & Zeckhauser, R. J. (2013). Jobs and kids: female employment and fertility in china. *IZA Journal of Labor & Development*, 2(1), 1–25.
- Flug, K., Spilimbergo, A., & Wachtenheim, E. (1998). Investment in education: do economic volatility and credit constraints matter? *Journal of Development Economics*, 55(2), 465–481.
- Funk, P., & Gathmann, C. (2015). Gender gaps in policy making: Evidence from direct democracy in switzerland. *Economic Policy*, 30(81), 141–181.
- Geys, B., & Sørensen, R. J. (2019, 8). The impact of women above the political glass ceiling: Evidence from a norwegian executive gender quota reform. *Electoral Studies*, 60. doi: 10.1016/j.electstud.2019.102050
- Ghani, S. E., Mani, A., & O’Connell, S. D. (2013). Can political empowerment help economic empowerment? women leaders and female labor force participation in india. *Women Leaders and Female Labor Force Participation in India (October 1, 2013). World Bank Policy Research Working Paper*(6675).
- Glomm, G., & Ravikumar, B. (1992). Public versus private investment in human capital: endogenous growth and income inequality. *Journal of political economy*, 100(4), 818–834.
- Grytten, J., Skau, I., & Sørensen, R. J. (2014). Educated mothers, healthy infants. the impact of a school reform on the birth weight of norwegian infants 1967–2005. *Social Science & Medicine*, 105, 84–92.
- Heath, R., & Jayachandran, S. (2016). *The causes and consequences of increased female education and labor force participation in developing countries* (Tech. Rep.). National Bureau of Economic Research.
- Hessami, Z., & da Fonseca, M. L. (2020, 6). Female political representation and substantive effects on policies: A literature review. *European Journal of Political Economy*, 63. doi: 10.1016/j.ejpoleco.2020.101896
- Horn, D., Kiss, H. J., & Lénárd, T. (2022). Gender differences in preferences of adolescents: evidence from a large-scale classroom experiment. *Journal of Economic Behavior & Organization*, 194, 478–522.
- Jauch, S., & Watzka, S. (2016). Financial development and income inequality: a panel data approach. *Empirical Economics*, 51(1), 291–314.
- Kuznets, S. (1955). American economic association. *The American Economic Review*, 45(1), 1–28.
- Liston-Heyes, C., & Ceton, G. C. (2007). Corporate social performance and politics: Do liberals do more? *Journal of Corporate Citizenship*(25), 95–108.
- Lott, J., & Kenny, L. (1997). *How dramatically did women’s suffrage change the*

- size and scope of government*, university of chicago law school (Tech. Rep.). Working Paper.
- Lott, J. R., & Kenny, L. W. (1999). Did women's suffrage change the size and scope of government? *Journal of Political Economy*, 107, 1163-1198. doi: 10.1086/250093
- Lundberg, S., & Pollak, R. A. (1996). Bargaining and distribution in marriage. *Journal of economic perspectives*, 10(4), 139-158.
- Marconi, G. (2018). Education as a long-term investment: The decisive role of age in the education-growth relationship. *Kyklos*, 71(1), 132-161.
- Marlow, M. L. (2013, 3). Public sector unions and government size. *Applied Economics Letters*, 20, 466-470. doi: 10.1080/13504851.2012.714058
- Miller, G. (2008). Women's suffrage, political responsiveness, and child survival in american history. *The Quarterly Journal of Economics*, 123(3), 1287-1327.
- OECD. (2022a). *Adult education level (indicator)*. doi: 10.1787/36bce3fe-en
- OECD. (2022b). *Collective bargaining coverage*. (data retrieved from OECD.Stat, <https://stats.oecd.org/>)
- OECD. (2022c). *General government spending (indicator)*. doi: 10.1787/a31cbf4d-en
- OECD. (2022d). *Gross domestic product (gdp) (indicator)*. doi: 10.1787/dc2f7aec-en
- OECD. (2022e). *Historical population*. (data retrieved from OECD.Stat, <https://stats.oecd.org/>)
- OECD. (2022f). *Income inequality (indicator)*. doi: 10.1787/459aa7f1-en
- OECD. (2022g). *Inflation (indicator)*. doi: 10.1787/eee82e6e-en
- OECD. (2022h). *Profile of graduates and new entrants: Share of graduates by gender*. (data retrieved from OECD.Stat, <https://stats.oecd.org/>)
- OECD. (2022i). *Trade union dataset*. (data retrieved from OECD.Stat, <https://stats.oecd.org/>)
- Onaran, Ö., Oyvatt, C., & Fotopoulou, E. (2022). Gendering macroeconomic analysis and development policy: a theoretical model. *Feminist Economics*, 1-33.
- Patnaik, A., Venator, J., Wiswall, M., & Zafar, B. (2020). The role of heterogeneous risk preferences, discount rates, and earnings expectations in college major choice. *Journal of Econometrics*. doi: 10.1016/j.jeconom.2020.04.050
- Phipps, S. A., & Burton, P. S. (1998). What's mine is yours? the influence of male and female incomes on patterns of household expenditure. *Economica*, 65(260), 599-613.
- Priyanka, S. (2020, 6). Do female politicians matter for female labor market outcomes? evidence from state legislative elections in india. *Labour Economics*, 64. doi: 10.1016/j.labeco.2020.101822

- Rubalcava, L., Teruel, G., & Thomas, D. (2009, 4). Investments, time preferences, and public transfers paid to women. *Economic Development and Cultural Change*, 57, 507-538. doi: 10.1086/596617
- Sinha, N., Raju, D., & Morrison, A. (2007). Gender equality, poverty and economic growth. *World Bank Policy Research Working Paper*(4349).
- Slegten, C., & Heyndels, B. (2019). Within-party sex gaps in expenditure preferences among flemish local politicians. *Politics and Gender*. doi: 10.1017/S1743923X18000685
- Sondheimer, R. M., & Green, D. P. (2010). Using experiments to estimate the effects of education on voter turnout. *American Journal of Political Science*, 54(1), 174-189.
- Stockemer, D. (2017, 2). Income inequality and women's descriptive representation. *International Journal of Comparative Sociology*, 58, 33-54. doi: 10.1177/0020715217692019
- Svaleryd, H. (2009, 6). Women's representation and public spending. *European Journal of Political Economy*, 25, 186-198. doi: 10.1016/j.ejpoleco.2008.12.004
- Tenn, S. (2005). An alternative measure of relative education to explain voter turnout. *The Journal of Politics*, 67(1), 271-282.
- The World Bank. (2022a). *Labor force participation rate, female (% of female population ages 15+)*. (data retrieved from World Development Indicators, <http://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>)
- The World Bank. (2022b). *Population growth (annual %)*. (data retrieved from World Development Indicators, <https://data.worldbank.org/indicator/SP.POP.GROW>)
- The World Bank. (2022c). *Proportion of seats held by women in national parliaments (%)*. (data retrieved from World Development Indicators, <http://data.worldbank.org/indicator/SG.GEN.PARL.ZS>)
- Thomas, S. (1991). The impact of women on state legislative policies. *The Journal of Politics*, 53(4), 958-976.
- Tridimas, G., & Winer, S. L. (2005, 9). The political economy of government size. *European Journal of Political Economy*, 21, 643-666. doi: 10.1016/j.ejpoleco.2004.11.003
- Turanli, M., Cengiz, D. T., Turanli, R., & Akdal, S. (2015). Effect of female education and labor force ratio on economic development. *Kuram ve Uygulamada Egitim Bilimleri*, 15, 387-396. doi: 10.12738/estp.2015.2.2350
- UN Women. (2021). *Facts and figures: Women's leadership and political participation*.
- UNDP. (2022). *Human development index*. (data retrieved from Human Development Reports,

<https://hdr.undp.org/data-center/human-development-index#/indicies/HDI>)

- Van den Broeck, G., & Maertens, M. (2015). Female employment reduces fertility in rural senegal. *PloS one*, 10(3), e0122086.
- Wang, L. W., Wang, S. T., & Huang, C. C. (2008, 5). Preterm infants of educated mothers have better outcome. *Acta Paediatrica, International Journal of Paediatrics*, 97, 568-573. doi: 10.1111/j.1651-2227.2008.00738.x
- Wang, T. (2021). The effect of female education on child mortality: evidence from indonesia. *Applied Economics*, 53, 3207-3222. doi: 10.1080/00036846.2021.1877253
- Yang, J., & Qiu, M. (2016, 2). The impact of education on income inequality and intergenerational mobility. *China Economic Review*, 37, 110-125. doi: 10.1016/j.chieco.2015.12.009

Appendix A

Country ID	Country	Code
1	AUSTRALIA	AUS
2	AUSTRIA	AUT
3	BELGIUM	BEL
4	CANADA	CAN
5	CHILE	CHL
6	COLOMBIA	COL
7	COSTA RICA	CRI
8	CZECHIA	CZE
9	DENMARK	DNK
10	ESTONIA	EST
11	FINLAND	FIN
12	FRANCE	FRA
13	GERMANY	DEU
14	GREECE	GRC
15	HUNGARY	HUN
16	ICELAND	ISL
17	IRELAND	IRL
18	ISRAEL	ISR
19	ITALY	ITA
20	JAPAN	JPN
21	KOREA	KOR
22	LATVIA	LVA
23	LITHUANIA	LTU
24	LUXEMBOURG	LUX
25	MEXICO	MEX
26	NETHERLANDS	NLD
27	NEW ZEALAND	NZL
28	NORWAY	NOR
29	POLAND	POL
30	PORTUGAL	PRT
31	SLOVAK REPUBLIC	SVK
32	SLOVENIA	SVN
33	SPAIN	ESP
34	SWEDEN	SWE
35	SWITZERLAND	CHE
36	TURKEY	TUR
37	UNITED KINGDOM	GBR
38	UNITED STATES	USA

Appendix B

Variable Name	Description	Years Included	Source
Share of Government Spending on Education in GDP	Government expenditure on education as a percentage of GDP	1995 - 2019	OECD Database
Share of Government Spending on Health in GDP	Government expenditure on health as a percentage of GDP	1995 - 2019	OECD Database
Share of Government Spending on Environmental Protection in GDP	Government expenditure on environmental protection as a percentage of GDP	1995 - 2019	OECD Database
Share of Total Government Spending in GDP	Total government expenditure as a percentage of GDP	1995 - 2019	OECD Database
The Gini Index	The Gini Index takes values between 0 and 1 where 0 represents perfect income equality and 1 represents perfect income inequality	2004 - 2019	OECD Database
Female Labor Force Participation Rate	Ratio of females in the labor force to the all females in the working age populaiton as a percentage	1990 - 2020	World Bank Database
Female Graduate Share	Share of female bachelor's degree graduates among all bachelor's degree graduates	2013 - 2019	OECD Database
Female Parliamentarian Share	Share of seats held by females in the parliament	1997 - 2020	World Bank Database
Female Tertiary Education Share	Share of females who at least completed tertiary level education out of all females in 24-65 years old population	1981 - 2020	OECD Database
GDP per capita	Gross Domestic Product per capita	1960 - 2021	OECD Database
GDP per capita Squared	Squared values of GDP per capita	1960 - 2021	OECD Database
Bargaining Power	Percentage of employees with right to bargain	2000 - 2019	OECD Database
Unionization Density	Share of net union members out of all employees	2000 - 2020	OECD Database
HDI	Human Development Index takes values between 0 and 1 where more developed countries have values closer to 1 in contrast with values closer to 0 belonging to less developed countries	1990 - 2019	UN Database
Youth Share	Percentage of the population aged between 5 - 24 out of all population	2005 - 2020	OECD Database
Elderly Share	Percentage of the population aged 65 and above out of all population	1950 - 2020	OECD Database
Population Growth Rate	Annual populaiton growth rate	1961 - 2020	World Bank Database
Ex-Communist Ideology	Countries coming from the communist background took the value of 1 and the others took the value of 0	1950 - 2021	
Inflation	Annual inflation rate computed through Consumer Price Index	1998 - 2021	OECD Database

Appendix C

List of countries with an ex-communist ideological history:

CZECHIA	ESTONIA	HUNGARY	LITHUANIA
LATVIA	POLAND	SLOVAK REPUBLIC	SLOVENIA

