

Female political representation and social spending

Second year master's thesis

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August 27, 2018

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Abstract

This thesis investigates whether the share of female legislative representation on a national level has an impact on public expenditure on social issues such as health care, education and elderly care. Using panel data primarily from the Comparative Welfare States dataset I perform a within-country analysis over time using both OLS and IV estimations. I use two instruments, laws on gender quota and average female political representation in neighboring countries. The data includes 22 OECD countries followed between 1980 and 2011. The economic literature on the role of a politician's gender in policymaking is still somewhat in its infancy and has largely been empirical. Assuming that the preferences of women and men differ, the gender of a political representative matters only if policy commitment is not complete. This implies that the politician can sidestep from the preferences of its constituent group and also take personal preferences into account. As the number of female representatives increases, this group gains bargaining power. Implemented policies will reflect this change in bargaining power and become more in favor of women's preferences. I find some evidence of female political representation having a positive impact on social public spending. The findings are however not robust using the OLS technique, only the IV technique. Therefore, I consider my findings to be inconclusive.

Keywords: social spending, female political representation, OECD, OLS, IV

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1 Introduction

Gender equality is increasingly discussed and seen as imperative to development in both high- and low-income countries. Debates regarding quotas in business boards have gained a lot of attention in media as well as from political leaders in world leading countries. Women's access to employment and the pay gap between men and women has for a long period of time been widely discussed in policy, media and the society at large. Gender equality is now seen as imperative to development throughout the world. The descriptive representation of women in politics is often stressed as important in order for women's interest to be represented, not the least regarding development policies. Even so, in political institutions throughout the world, there tends to be a male bias in representation. Efforts have been, and are increasingly made to increase women's descriptive representation in political spheres, on local, national and international levels (Rai, 2014). Empirical studies on women's suffrage around the world show that preferences differ between men and women. The latter group tends to prefer more public spending, especially regarding social issues such as health care, education, and elderly care (Abrams and Settle, 1999, Lott and Kenny, 1999). If preferences differ between men and women, does this affect decision making in legislatures as the descriptive representation of women increases? Using data on 22 OECD countries between the years of 1980 to 2011, this thesis aims to investigate whether the gender of politicians has an impact on public social spending.

Existing research on women's political representation and its effect on policy making is mainly focused on the effect on female leadership or female labor participation. The research on the effect of female political representation on public spending is not as vast. I estimate the effect of female political representation on social spending both overall and disaggregated on specific areas; education, health care, daycare, family policy and elderly care.

The research question of the thesis is *Does female political representation affect public spending within social policy?*

Building on a theoretical framework of a principal-agent type, I perform a panel data analysis using both OLS and IV estimation methods. Assuming that preferences of men and women differ, the gender of the politician matters if she can sidestep from complete policy commitment

and take her personal preferences into account. The empirical analysis is performed on data from the Comparative Welfare States Dataset (CWS) covering 22 OECD countries between 1980 and 2011. By using data on a large number of countries, rather than performing a case study, I enable general inference on the issue. In the IV estimations, the instruments I use are laws on gender quotas and the average female political representation in neighboring countries. I use country fixed effects in the estimations in order to account for any unobserved characteristics on a country level. I perform estimations both including and without including time fixed effects. I do so since time fixed effects pose a trade-off between accounting for unobserved shocks such as world recessions and capturing the effect I want to estimate.

The empirical results in this thesis are inconclusive. I find some evidence of female political representation affecting public social spending positively both in OLS and in IV estimations. However, when adding time fixed effects, the significance level disappears in the OLS estimates. This suggests that the OLS technique is sensitive to estimating this type of relationship. Therefore, I do not consider the results to be robust. Even so, the IV regressions provide some positive and significant estimates also when including time fixed effects.

Existing research on the effects of female political representation provides evidence of a positive impact of female political representation on social policy at large (Pande, 2003, Paxton et al, 2010, Gerrity and co-authors, 2007). There are some studies specifically investigating the effect on social spending. Using OLS, Seok Park (2017) finds evidence of female political representation having a positive effect on social spending in OECD countries. Analysing 12 capitalist economies between the years of 1980 and 1999, Bolzendahl and Brooks (2007) also provides evidence of female political representation having a positive impact on social spending. Svaleryd (2007) shows that female political representation has a positive impact on social spending on a local level in Sweden. According to Kotsadam and Nerman (2012) the common estimation technique OLS gives biased estimates. They argue that female political representation is endogenous to public policy, and that estimation techniques such as instrumental variable (IV) analysis is preferable. Estimating the effect of gender quotas in national legislatures in Latin America, they cannot find any evidence of this having an effect on public spending.

The effect of women's political representation has to my knowledge previously not been performed with a combination of a basis in economic theory, this data set and with the

methodology I present. Existing research uses pre-dominantly OLS in order to estimate the effect of female political participation on social spending. By using both OLS and IV analysis I provide results robust for potential biasedness, for instance simultaneity and endogeneity issues. By using the IV estimation technique, I provide estimates robust for the critique of Kotsadam and Nerman (2012). I use data covering a range of countries with different characteristics. This enables general inference on this issue.

The thesis is outlined as follows; section 2 gives a theoretical background of politician's behavior and preferences. In section 3 I describe previous research. Section 4 describes the data used and section 5 continues with a description of the methodology. Section 6 covers the results and in section 7 I combine theory and results and perform an analysis.

2 Theoretical background

This section presents a model/theory of principal-agent type, explaining how politicians can be incentivized to diverge from the preferences of the constituent group and act according to her personal preferences. Bargaining power explains how increased female legislative representation can have an effect on legislative outcomes. This section also discusses the existence of preferential differences between men and women.

2.1 Actions of the politician

A version of a principal-agent model of repeated elections presented by Ferejohn (1986) illustrates how politicians can be induced to act according to the interests of their constituents or the opposite, to diverge from the preferences of their constituents and instead act according to their personal preferences. The model is based on repeated elections where the desire to retain office and the degree of political competition affect the actions of politicians.

Voters control politicians through repeated elections. Electors assess politicians' performance based on their own well-being which implies that the politician is an agent of the electorate. The electorate imperfectly monitors the actions of the politician; the electors can only observe outcomes, not actual actions. The politician is assumed to desire reelection as well to act according to her personal preferences.

The elector assesses her utility after each period. If the utility level is high enough, the elector will vote for the incumbent to retain office. Thus, the politician is incentivized to act according to the preferences of the electorate. The existence of challengers is important in order for the voter to have leverage on the politician. Otherwise, there would be no incentives to act according to the electorate in order to retain office. The politician will act according to the preferences of the electorate if the desire to be reelected is high enough. Furthermore, as the political competition increases the risk of defeat increases, and vice versa with low political competition. With low political competition or desire to be reelected, there is room for the politician to diverge from the preference of the electorate and act according to her own preferences.

Besley and Case (1995) construct a model where the actions of incumbent office holders will be affected by the chances of reelection. If there is a term limit, that is, a limited amount of terms a single politician can hold office, one can expect that the politician will to a greater extent diverge from policy commitment and take her personal preferences into account (Besley and Case, 1995). This theory could be applied to the incentive structures of different electoral systems. In a plurality and majority electoral system, individual politicians are elected into office, whereas in proportional systems a politician is indirectly chosen through party lists. The degree of competition, and thus incentives to act according to the preferences of the electorate rather than personal preferences, for the individual politician could be assumed to be larger in plurality and majority systems than in a proportional system. Politicians within proportional systems could thus be assumed to diverge from policy commitment and take personal preferences into account to a greater extent.

2.2 Women's bargaining power

If politicians would fully commit to previously set policies, the bargaining power of women as an interest group would not matter. If we instead assume incomplete commitment and that politicians can take their personal preferences into account, and also that women have similar preferences as each other but different preferences than men, the bargaining power of women matters. As the fraction of female politicians in legislative assemblies increases, the bargaining power of women as a group with similar preferences will increase (Svaleryd, 2007). In this thesis, I define female political representation as share of women in national legislatures.

2.3 Preferential differences between men and women

Preferential differences between men and women are an empirical issue. Research on the effects of women's suffrage suggests different voting preferences between men and women. When women were given the right to vote public expenditure increased (Clots-Figueras, 2012). A vast amount of research shows that women are more invested in welfare state related issues, such as education and health care, than men (Bolzendahl and Brooks, 2007). Thereto, research on household economy shows that women tend to use their income on food security and in order to care for their children in a larger extent than men. Men on the other hand tend to spend a larger fraction of their income on leisure activities than women (Molyneux, 2008). This implies that women are inclined to care about public expenditure regarding social policy areas, such as childcare and education, in a wider extent than men.

Lott and Kenny (1999) examine the effects of women's suffrage in the United States and conclude that this increased public expenditure. They attribute the difference in preferences to the fact that women tend to have a lower income than men and therefore benefit more from redistributive programs, especially single women. Funk and Gathmann (2006) examine preferential differences between men and women in Switzerland. They too find that women's suffrage increased government spending. Furthermore, they find that the difference in political preferences has increased over time. At the time of suffrage adoption, women and men were equally inclined to support publicly provided health care and welfare services, whereas over the last decades women have become more inclined to support this than men. Abrams and Settle (1999) also find that women's suffrage in Switzerland increased social welfare spending. These results indicate that men and women differ in preferences regarding public expenditure, especially regarding social spending. Even though there is empirical evidence that men and women have different preferences regarding welfare state politics and public spending it is less clear that female politicians consider themselves to be messengers of female "issues" (Bolzendahl and Brooks, 2007).

To summarize the theoretical section, one can expect female political representation to have an impact on public expenditure due to differences in preferences among men and women. An increasing share of female political representation will then increase the bargaining power of women as an interest group, and therefore enable changes in public policy. Thereto, for the gender of the political representative to have a causal effect on public expenditure, it is required that policy commitment is not complete and that the female political representative diverges from the previously set policy commitment. One can furthermore expect that different electoral systems will enable actions according to personal preferences, and that proportional electoral systems will favor this more than majority or plurality electoral systems.

3 Previous research

The literature on female political representation focuses to a large extent on the effects of gender quotas on female political representation and political engagement among women (Paxton et al, 2010, Zetterberg, 2009). There is some research on the effect of female political representation on public policy, both on local and on national levels. Pande (2003) investigates the effect of local political reservation for women in rural India and finds that this has an impact on policy making benefitting this particular group. She finds that a one percentage point increase in political reservation towards certain tribes increases state spending on welfare programs to this group by 0.8 percentage points. Pande also provides empirical evidence suggesting that complete policy commitment can be absent in democracies. This means that politicians sidestep from policies they've committed to, and to some extent act according to their personal preferences (Pande, 2003).

Chattopadhyay and Duflo (2004) present results in line with the findings of Pande. Svaleryd (2007) presents evidence of women's political representation having an impact on public spending on a subnational level in Sweden. Svaleryd estimates the increase in childcare spending relative to elderly care spending. She for instance finds that as female political representation increases by approximately 9 percentage points, the spending on childcare relatively to elderly care increases by 5 percentage points. Caizza (2004) perform a two-stage analysis of women's representation in US state legislative assemblies. She finds that attitudes on gender within political parties influence women's political representation which in turn positively affect the extent of policies beneficial to women.

Looking at research on female political representation on a national level, there are both case-studies and cross-country research. Bolzendahl and Brooks (2007) perform a cross-country time-series analysis on twelve countries similar to those in my sample, for the years 1980-1999. They find evidence for positive impact of female political representation on public spending. According to the findings of Bolzendahl and Brooks, one standard unit change in women's political representation gives approximately one percent increase in welfare state spending effort. They compare this to the effect of the same increase of females in the labor force. They find that an increase in female political representation has a larger effect on welfare state spending than the corresponding change in female labor force participation. Bolzendahl (2009)

presents research with a broader scope, investigating women's presence both in political assemblies and in the labor market in 12 capitalist economies. She finds that increased female participation in both these areas have positive impacts on social spending. Using the same data set as I do in this thesis, Seok Park (2017) finds that increasing women's political representation increases public spending within the areas of education and daycare. He does so by performing an OLS estimation with fixed effects. However, he does not specify whether the fixed effects are both country fixed effects and year fixed effects or only country fixed effects. Specifically, Seok Park finds that a 10 percent increase in female political representation increases daycare spending with 0.12 percentage points, and education spending with 0.5 percentage points.

There are a number of studies focusing on the US Congress. Gerrity and co-authors (2007) investigate the effect of female politicians in the U.S House of Representatives and find that women who replace men in the same district tend to introduce more bills regarding women's issues. They thereto find significant difference in bills regarding women's issues sponsored by men replacing women. A similar study is made by MacDonald and O'Brien (2011) who find that female US representatives tend to promote legislation regarding women's issues more than men. They stress that this effect is more prominent as the number of female representatives increase, suggesting that the bargaining power of women as an interest group is important. Swers (1998) uses OLS analysis to investigate whether female politicians in the US national congress promote women's issue bills in a larger extent. Thereto, she investigates whether gender matters differently depending on party affiliation. She finds a positive relationship between female politicians and women's issue bills, and she also finds evidence of gender mattering more in the Republican party than in the Democratic party.

Kotsadam and Nerman (2012) however present evidence contradicting the results above. They claim that previous research, which most often uses versions of OLS to estimate the effect, is flawed. They claim that change in female political representation is not exogenous to public spending and that OLS therefore produces biased results. Kotsadam and Nerman therefore use IV analysis. Using gender quotas as instruments for female political representation in Latin America, they do not find evidence of this having an impact public spending.

Table 1 gives an overview of the previous research most relevant for this thesis. The vast majority finds a positive impact of women’s political representation on social policies.

Table 1 Core findings in previous research

Author(s)	Years covered	Countries covered	Main findings	Estimation strategy
Svaleryd	1985-1997	Sweden	Positive impact of female political representation on social spending on a local level	OLS, fixed effects (municipality and year)
Bolzendahl and Brooks	1980-1999	12 OECD countries	Positive impact of female political representation on social spending on a national level	GLS (Prais-Winsten)
Seok Park	1960-2011	22 OECD countries	Positive impact of female political representation on social spending on a national level	OLS, fixed effects
Pande	1960-1992	India	Political reservation for women have a positive impact on transfers to this group. Complete policy commitment may be absent in democracy.	OLS, fixed effects (country and year)
Kotsadam and Nerman	1995-2007	18 Latin American countries	Do not find evidence of electoral gender quotas on social policy	IV
Gerrity and co-authors	1994-2002	USA	Female legislators more often than their male counterparts support bills regarding womens issues	OLS

4 Data

I use data from the CWS data set, with coverage for the years 1980 to 2011 (with the exception of a few variables that are covered a shorter period of time). I use data on 22 OECD countries, see appendix 1. The data set consists of various indicators regarding economy, policy, demography and welfare state. It was first constructed as a part of a project called "Comparative Welfare States in the 21st Century" and it is updated continuously. The data set contains data from 1960 to 2014, but the variables used in this thesis are pre-dominantly only available between 1980 and 2011 (Brady et al, 2014). This data set is used in various studies regarding different welfare issues, for instance Bolzendahl and Brooks (2007), Seok Park (2017) and Huber and co-authors (2009). The dependent variable in this thesis is social public spending - in total and disaggregated on different policy areas: health care, daycare, elderly care, family benefits and education. Additional data is collected from the International Institute for Democracy and Electoral Assistance (International IDEA).

The main variable of interest is share of seats in the national parliament held by women after the most recent election. I also construct an interaction variable of share of seats in the national parliament held by women and type of electoral system. This is done on the basis of the theoretical reasoning presented in section 2. The politician is assumed to neglect her own personal preferences if the desire to be reelected is high. Assuming that majority or plurality system, where voters elect individuals directly in contrast to proportional systems where voters are electing party lists, would increase incentives to be reelected. Politician's in these systems should be expected to act according to their own preferences in a lesser extent than a political representative in a proportional system.

In order to separate the preferences of the constituent group and of the politician, I control for demographic patterns such as age and political affiliation. In this way, I control for median voter effect, which says that the political outcome will be in line with the preferences of the median voter. A large age group will thus affect the "position" of the median voter and therefore have an impact on public spending (Svaleryd, 2007). For instance, when explaining effect on spending on elderly care I include share of elderly people in the population and equivalent for children when estimating the effect of childcare spending. Political affiliation is controlled both through including a variable of share of seats in parliament held by a certain political group as

well dummy variables for political majority. The rationale for controlling for political affiliation is similar to that of controlling for age. The bargaining power of a certain political group increases with size and the size of a political group within the parliament will most likely reflect the preferences of the constituent group. Furthermore, I control for unemployment rate, GDP, share of women in labor force, size of population and share of population with higher education. See appendix 2 for a detailed list of control variables used in specific regressions.

Table 1 displays the variables I use in the estimations. As noted by the descriptive statistics there is variation both across countries and over time.

Table 2 Descriptive statistics of variables used in regressions

Variable	Mean	Standard deviation	Min	Max
Social spending	20.97	5.14	9.90	35.68
Eldery care	6.76	2.24	2.56	12.98
Health care	5.72	1.28	0	8.967
Family policy	1.96	1.08	0.15	4.85
Daycare	0.53	0.52	0	2.03
Education	5.27	1.21	1.77	8.74
Female political representation	19.05	11.67	0.4	47.3
Left seat	38.17	15.54	0	68.6
Left majority	0.19	0.39	0	1
Christian seat	11.17	15.02	0	49
Log of total unemployment	6.07	1.71	0.09	9.60
Log of real GDP	12.90	1.43	9.04	16.40
Female labor force	0.62	0.12	0.32	0.96
Log of population	9.60	1.42	5.90	12.65
Log of population under 15 years old	9.73	1.41	4.14	11.02
Log of population over 65 years old	7.66	1.45	3.88	10.63
Tertiary education	19.51	10.73	3.3	53.9
Proportional	0.77	0.42	0	1
Interaction	16.23	13.79	0	47.3
Average female political representation	9.20	5.51	1.24	25.3
Quota	0.08	0.27	0	1

Figure 1 below plots female political representation and social spending. It is evident that there is a positive correlation. For instance, in 1980 female political representation in Greece is 3.3 percent and social spending is 10.3 percent. In the same year, female political representation in Finland is 26 percent and social spending is 18.1 percent. Both these countries do experience increases in both female political representation as well as social spending. By the year of 2009 female political representation in Greece has increased to 16.33 percent and social spending to

23.88 percent. In Finland, the corresponding numbers have increased to 41.5 percent and 29.44 percent respectively.

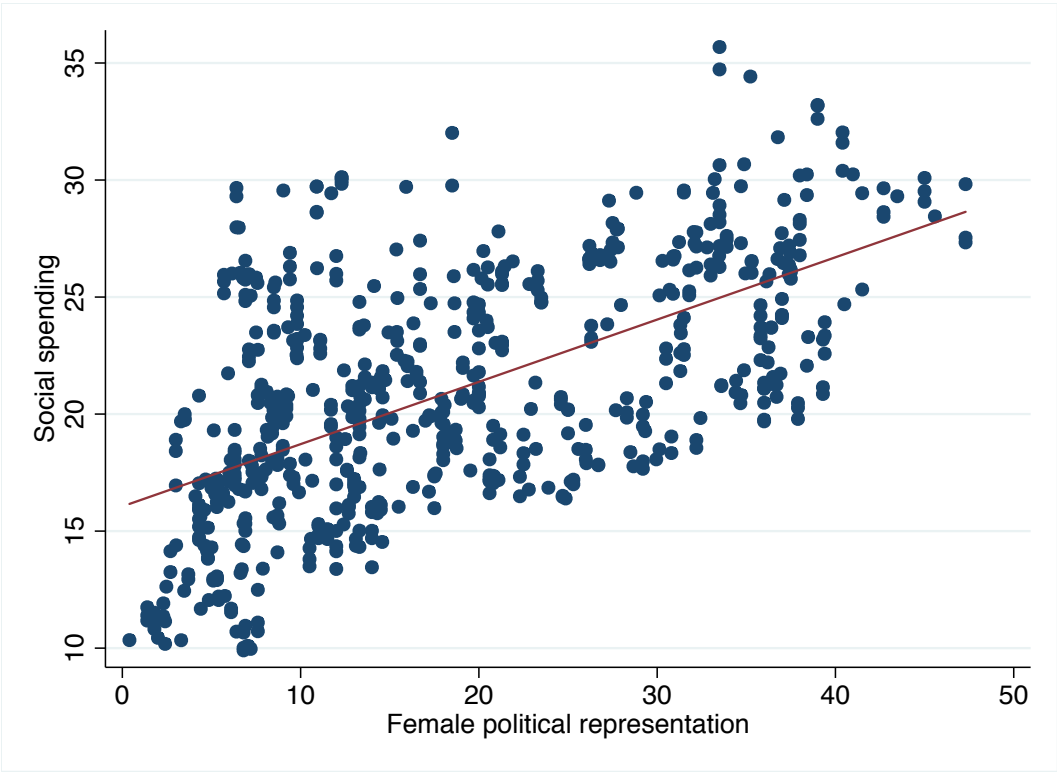


Figure 1 Plot of female political representation against social spending

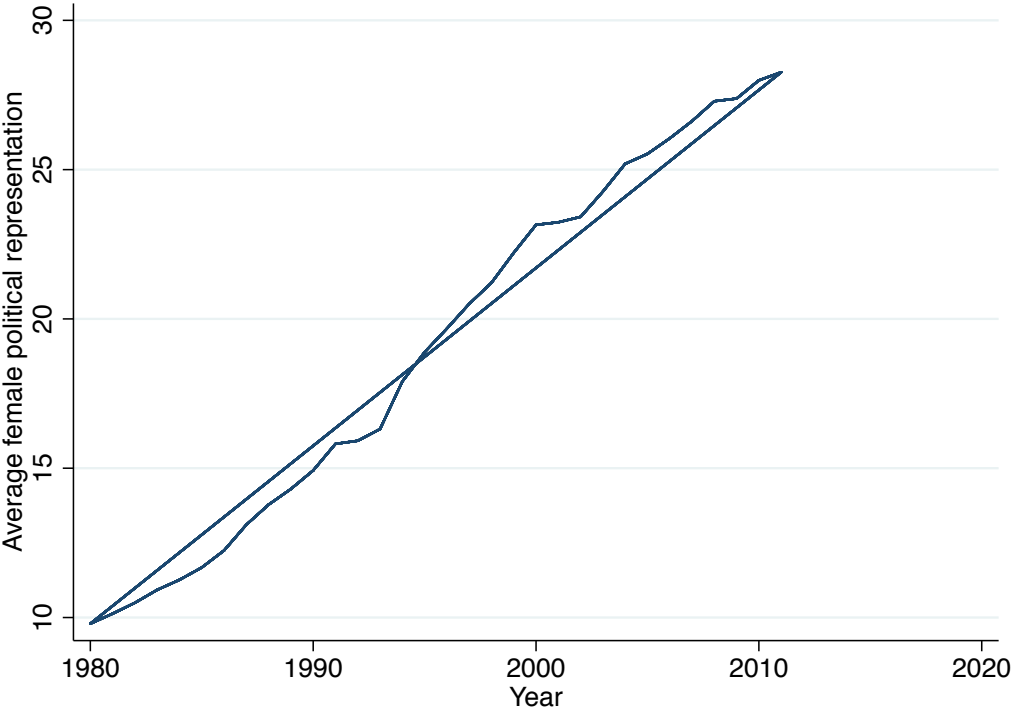


Figure 2 Overall female political representation

Figure 2 shows the development of female political representation over years of all countries in the sample. Since I use fixed effects specifications I will estimate change within countries over time. Thus, it is imperative that there is variation over time in this variable. This is confirmed by figure 2. Worth noting is that there is some difference across countries both in levels and in the development over time. For instance, female political representation in Sweden is 27.8 percent in 1980, and 47.3 percent in 2011, while in Japan it is 2 percent in 1980 and 9.77 percent in 2011.

5 Method

I conduct two types of regression analysis, OLS and IV estimation. By using two types of estimation techniques, I control for different types of caveats related to each technique. In this section I start by describing the OLS regressions and then continue to describe potential problems of this method. Thereafter, I outline the IV estimations, describe strengths and potential caveats of this method.

5.1 Ordinary least squares (OLS)

In order to estimate the effect of female political representation on public spending I perform ordinary least squares (OLS) regressions using panel data. I take use of fixed effects on country level, which eliminates country specific changes that have an effect on public spending. I include time fixed effects to control for events common to all countries, such as a world recession. However, using time fixed effects is somewhat complicated since this possibly also can capture variation due to the variable of interest. In section 7 I further discuss the implications of this. Controlling for demographic composition on a country level eliminates the effects on public spending due to demographic changes. Through other covariates such as GDP I control for Wagner's law, that is, as a country grow richer public spending tend to increase.

By using fixed effects, I obtain a so-called within estimator which, as the name suggests, produces estimates of variations within countries over time, rather than estimations of variations between countries (Angrist and Pischke, 2009). A caveat of using a within-estimator is that you lose possibly useful information that could be drawn from comparing countries. If there is not much variation over time in explanatory variables, but more variation across countries, you might lose valuable variation that could explain the question at hand. An effect of this is larger standard errors, since the precision of the estimates is reduced. Thus, this poses a trade-off between precision and biasedness (Allison, 2009). However, since it highly plausible that there are underlying country-specific characteristics affecting both female political representation and social spending, it seems inevitable to use country fixed effects to avoid biased results. In order to deal with heteroscedasticity, I use clustered standard errors in the OLS estimation where I cluster on country assuming that standard errors are correlated within but not between countries.

The general fixed effects OLS specification looks as follows:

$$spending_{it} = \beta_0 + \beta_1 FP_{it} + \beta_2 X_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where $spending_{it}$ denotes a particular type of social spending, FP_{it} denotes the variable of interest; representation of women in national parliaments. X_{it} represents a vector of controls, α_i denotes country specific effects and λ_t denotes year specific effects. The residual is denoted by ε_{it} .

OLS with lag

There is reason to believe that there exists some sort of time lag in the relationship between female political representation and social spending. This is because the political process requires a certain amount of time. Furthermore, there is a time lag between a policy decision and actually implementing what has been decided. Therefore, I also estimate the OLS equations using time lags on female political representation. I perform two sets of time lag regressions; lagged one year and lagged two years. The specification is similar as in (1), with the difference that female political representation is lagged one and two periods respectively, FP_{it-n} .

$$spending_{it} = \beta_0 + \beta_1 FP_{it-n} + \beta_2 X_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (2)$$

OLS with an interaction variable

$$spending_{it} = \beta_0 + \beta_1 FP_{it} * prop_i + \beta_2 FP_{it} + \beta_3 prop_i + \beta_4 X_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

The interaction specification is similar to (1), with a few exceptions. The interaction variable is constructed from the original female political representation variable FP_{it} and a dummy variable, $prop_{it}$, which takes the value 1 if country i has a proportional electoral system. Electoral system is constant over time, therefore I cannot include country fixed effects, since the within-country variation is zero in the $prop_{it}$ variable. Therefore, I use a random effects model, including year dummies to account for time fixed effects.

4.2 Instrumental variable (IV) analysis

There is a possible issue of simultaneity bias, that is, not only is it possible that female political representation affects social spending but social spending also might affect female political representation. In addition to the OLS analyses, I therefore perform two sets of IV regressions using the average of female parliamentarians of nearby countries and laws on political gender quotas as instruments. IV analysis is a common strategy in order to deal with issues of simultaneity bias (Angrist and Pischke, 2009).

There is a possibility that the causality runs in the opposite direction than is suggested by me. It is reasonable to think that a relatively wealthy country also has more women in the labor force or in political positions. However, this would be an effect of the previously mentioned Wagner's law, which is controlled for by including GDP covariates. Furthermore, if increased social spending increases female political representation, this should have a significant time lag. If increased social spending for instance increases access to education for girls and women and therefore increases their tendency to run for office, this would not happen in the same year as they attain education. Rather, one could expect a time lag of at least ten years. Therefore, public spending should not affect female political representation simultaneously as female political representation affects public spending.

If there are simultaneity issues, the explanatory variable female political representation will be correlated with the error term. The zero-conditional mean assumption, $E[u|x] = 0$ is then not fulfilled. If this is the case, OLS does not measure a causal effect but only correlations. This can be solved using instrumental variable analysis. The instrument replaces the endogenous explanatory variable and should fulfill some conditions in order to give causal estimates. First and foremost, the instrument should be correlated with the endogenous variable. This is indicated by a F-statistic above 10 and is usually referred to as a strong first stage. Furthermore, the exclusion restriction needs to hold. That is, the only way the instrument z affects the outcome y , is through the endogenous explanatory variable x . The instrument should also be uncorrelated with any other determinants of y . The exclusion restriction cannot be tested, it is a so called identifying assumption. The fact that the only direct correlation runs through the endogenous explanatory variable enables the instrument to be left out of the main outcome equation without causing omitted variable bias (Angrist and Pischke, 2009). If these conditions

are fulfilled, the problem with possibly biased results from OLS estimations is solved using IV estimation. I perform the analysis by using two-stage-least squares (2SLS) regressions.

I use two different instruments, law on gender quotas in parliaments and a calculated average of female political representation in nearby countries. I construct the average variable from the same variable used in the OLS regressions, for a detailed specification, see appendix 3. I construct the quota variable as a dummy where the value one is assigned if there is a law regulating party nomination lists on a national level at time t , otherwise the value is set to zero. Political gender quota has previously been used as instruments for estimating the effect of women in politics on public spending by for instance Kotsadam and Nerman (2012). The instrument, quota laws, correlates with the endogenous explanatory variable female political representation rate, which in turn affects public spending. It should be noted that it can be discussed whether or not laws on gender quotas are not affected by public spending in the same spirit as the original variable female political representation, I discuss this further in section 7.

Regarding the second instrument, assuming that countries in the vicinity of each other share some cultural and historical traits, there are possible spillover effects of political developments between countries. For instance, when more women engage in politics in Sweden, this encourages similar developments in Norway. Thereto, political representation in one country cannot have a direct effect on public spending in another country, it has to run through the endogenous variable, which then fulfills the exclusion restriction.

The specifications are as follows;

$$spending_{it} = \beta_0 + \beta_1 FP_{it} + \beta_2 X_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (4)$$

Where the first stage becomes;

$$FP_{it} = \gamma_0 + \gamma_1 z_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (5)$$

FP_{it} once again denotes female political representation. z_{it} denotes the instrument, that is, quota or average female representation. It is not possible to include cluster robust standard errors in the IV analysis, which is the reason to why those are normal standard errors. This could be a potential error source in the IV estimations.

6 Results

I start by presenting the results from the OLS estimates, without and including time-lags and with interaction variable. Thereafter the IV results are presented, one instrument at a time.

6.1 OLS results

Table 3a OLS with country fixed effect

Outcome:	(1) Social spending	(2) Elderly	(3) Health	(4) Family	(5) Daycare	(6) Education
FP	0.111* (0.0564)	-0.00113 (0.0178)	0.0223 (0.0200)	-0.00923 (0.0130)	0.0109** (0.00446)	0.0731** (0.0266)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.455	0.620	0.466	0.392	0.538	0.253
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Table 3a OLS including country and time fixed effects

Outcome:	(1) Social spending	(2) Elderly	(3) Health	(4) Family	(5) Daycare	(6) Education
FP	0.00514 (0.0626)	-0.0279 (0.0266)	-0.0121 (0.0183)	0.00202 (0.0127)	0.00546 (0.00747)	0.0527 (0.0356)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.552	0.661	0.558	0.453	0.582	0.308
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Tables 3a and 3b show estimates of OLS without and with time fixed effects. Country fixed effects are used in all regressions. In table 2a the estimates on overall social spending (1), daycare spending (5) and education (6) come out positive and significant. As shown in column

(1), overall social spending is significant at the ten percent level. The result implies that as female political representation increases by one percentage unit overall social spending increases by 0.11 units. The estimate on daycare spending is significant at the five percent level and indicates that as female political representation increases by one percentage unit, daycare spending increases by 0.01 units. The education estimate is significant at the one percent level, and suggests that as female political representation increases by one percentage point, spending on education increases by 0.07 units. As shown in table 3b all significance is lost when including time fixed effects. Some of these estimates come out negative which suggests that the time fixed effect dummies might absorb some variation that I actually want to estimate. I discuss this further in section 7.

One should note that, due to limitations in available data, the disaggregated variables do not perfectly correspond to the general public spending variable. Therefore, one cannot derive the change in column (1) in the other columns, in respective tables.

Table 4a OLS with one-year lag and country fixed effects

Outcome:	(1) Social spending	(2) Elderly	(3) Health	(4) Family	(5) Daycare	(6) Education
FP lag	0.100* (0.0550)	-0.000487 (0.0174)	0.0205 (0.0191)	-0.00843 (0.0127)	0.0111** (0.00418)	0.0704*** (0.0241)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.450	0.620	0.465	0.391	0.541	0.265
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Table 4b OLS with one-year lag including country and time fixed effects

VARIABLES	(1) Social spending	(2) Elderly	(3) Health	(4) Family	(5) Daycare	(6) Education
FP lag	-0.0128 (0.0623)	-0.0282 (0.0265)	-0.0169 (0.0185)	0.00278 (0.0126)	0.00354 (0.00807)	0.0627* (0.0334)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.552	0.662	0.559	0.453	0.597	0.344
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Tables 4a and 4b show OLS estimates using a one-year lag on the variable of interest, female political representation. As in table 3a, the estimates on overall spending (1), daycare (5) and educational spending (6) come out positive and significant. This implies that increased female political representation has a positive impact on overall social spending and regarding daycare and education. However, once again the significance on all estimates except on education (6) is lost when adding time fixed effects, as shown in table 4b. Due to data limitations, the number of observations regarding education is small. Furthermore, the significance level is weak at the ten percent level, so I am hesitant to draw any conclusions from this estimate. Once again, some estimates come out negative. This indicates that the time fixed effects absorb some of the effect I want to estimate.

Table 5a OLS with two-year lag and country fixed effects

Outcome:	Social spending	Elderly	Health	Family	Daycare	Education
FP lag 2	0.0886 (0.0528)	-0.00106 (0.0174)	0.0196 (0.0189)	-0.00847 (0.0124)	0.0107** (0.00411)	0.0740*** (0.0236)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.444	0.620	0.464	0.391	0.538	0.272
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Table 5b OLS with two-year lag including time and country fixed effects

VARIABLES	(1) Social spending	(2) Elderly	(3) Health	(4) Family	(5) Daycare	(6) Education
FP lag2	-0.0296 (0.0613)	-0.0292 (0.0263)	-0.0188 (0.0208)	0.00226 (0.0127)	0.00271 (0.00822)	0.0687* (0.0357)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	665	651	585	115
R-squared	0.553	0.662	0.560	0.453	0.596	0.343
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

The OLS results with a two-year lag are displayed in tables 5a and 5b. In table 5a, the estimates on daycare and education is significant at the five and one percent level, respectively. The significance is lost on the daycare estimate when including time fixed effects.

Table 6 Random effects OLS with interaction variable, including time fixed effects

Outcome:	Social spending	Elderly	Health	Family	Daycare	Education
Interaction	-0.0990 (0.0744)	-0.0450 (0.0315)	-0.0252 (0.0241)	-0.0375** (0.0178)	-0.00643 (0.0117)	0.0550** (0.0279)
Proportional	2.741 (3.814)	0.141 (1.366)	0.283 (0.851)	0.596 (0.655)	0.206 (0.227)	-1.296*** (0.481)
FP	0.120* (0.0717)	0.00958 (0.0340)	0.0162 (0.0205)	0.0417** (0.0177)	0.0103 (0.0108)	0.0173 (0.0244)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No	No	No
Observations	651	651	665	651	585	115
Number of id	22	22	22	22	22	22

Robust standard errors in parentheses

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

Table 6 displays estimates from the OLS random effects estimation, including controls and time fixed effects. The estimates are virtually insignificant, with the exception of the estimates on family policy spending, which surprisingly is negative, significant at the five percent level, and the estimate on education spending. I also run the random effects OLS without time fixed effects. In these regressions, the interaction variable estimates mostly become insignificant but

the female political representation variable estimates come out positive and significant. The latter variable denotes the effect of female political representation when the electoral system is not proportional.

Since I cannot run regressions with country fixed effects due to the electoral system variable, I also perform fixed effects OLS regressions for the two groups of electoral systems (where the number of countries with proportional system are 17 and not proportional are 5) separately. They show similar results as the random effects estimations. Thus, I cannot provide evidence to the suggestion that politicians in proportional electoral systems to a larger extent can take their personal preferences into account.

6.2 IV results

In this section I present results from the IV estimations. Tables 7a and 7b show estimates using the quota variable, a dummy for whether there is a law at time t controlling party list nominations on a national level, as an instrument. The quota law should be correlated to female political representation in national legislative assemblies. If there is an effect on social spending, this should run through the variable of interest, female political representation. Tables 8a and 8b show IV estimates using average female political representation in neighboring countries as an instrument. This instrument works through the possible cultural spillover effects among countries in each other's vicinity.

Table 7a IV 2SLS, instrument: quota including country fixed effects

IV 2SLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
FP (quota)	0.307*** (0.0451)	0.475*** (0.0984)	0.164*** (0.0518)	0.151*** (0.0382)	-0.0102 (0.0157)	0.0618*** (0.0114)	0.548 (2.991)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	651	665	651	585	115
Number of idn	22	22	22	22	22	22	22
R-squared	0.0676	0.1309	0.3379	0.1881	0.3917	0.0828	0.2178

Standard errors in parentheses

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

Table 7b IV 2SLS, instrument: quota, including country and time fixed effects

IV 2SLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
FP (quota)	0.681** (0.323)	1.059* (0.605)	0.341 (0.221)	0.311 (0.233)	0.0167 (0.0558)	0.331 (0.332)	0.000916 (0.179)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	651	665	651	585	115
R-squared	0.3529	0.1582	0.0001	0.0041	0.4433	0.1473	0.2707
Number of id	22	22	22	22	22	22	22

Standard errors in parentheses

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

Table 7a and 7b display IV estimates using the quota-variable as instrument, without and including time fixed effects respectively. First stage estimates are shown in appendix 4, tables A4.1 and A4.2. All first stage estimates show strong F-statistics, which indicates that the quota variable serves as a strong instrument. In table 6a all estimates are positive and significant at the one percent level except for the estimates on family (5) and educational (7) spending which are insignificant.

Adding time fixed effects weakens the significance level for overall social spending and removes the significance level from elderly care spending (3), health care spending (4) and daycare spending (6). The estimate on social spending including control variables (2) is positive and significant at the ten percent level. Once again, one should note that, due to limitations in available data, the disaggregated variables do not perfectly correspond to the general public spending variable. Therefore, one cannot derive the change in column (1) and (2) in the other columns.

Table 8a IV 2SLS, instrument: average female political representation including country fixed effects

IV 2SLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
FP (avg FP)	0.291*** (0.0179)	0.430*** (0.0433)	0.119*** (0.0203)	0.119*** (0.0155)	-0.00815 (0.00749)	0.0151*** (0.00343)	0.203*** (0.0568)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	651	665	651	585	115
Number of id	22	22	22	22	22	22	22
R-squared	0.0981	0.2063	0.4716	0.3068	0.3917	0.5325	0.1011

Standard errors in parentheses

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

Table 8b IV 2SLS, instrument: average female political representation, including country and time fixed effects

IV 2SLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
FP (avg FP)	1.740** (0.674)	0.841*** (0.182)	0.191*** (0.0571)	0.150*** (0.0490)	0.0254 (0.0213)	-0.0406* (0.0220)	0.372 (0.242)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	651	651	665	651	585	115
R-squared	0.3180	0.1547	0.3364	0.2998	0.4290	0.2951	0.2331
Number of id	22	22	22	22	22	22	22

Standard errors in parentheses

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

Tables 8a and 8b show IV estimates when using average of female political representation in neighboring countries as the instrument. First stage estimates are shown in appendix 4, tables A4.3 and A4.4. All first stage estimates show strong F-statistics, which indicates that average female political representation serves as a strong instrument. Thus, there is some sort of correlation of female political representation between geographically close countries. In table 5a all estimates are positive and strongly significant at the one percent level, except for family policy spending which come out insignificant. When adding time fixed effects, as shown in table 8b, the significance vanishes from the estimates of family (5) and educational (7) spending. The significance level is weakened on the estimates of overall social spending without controls (1) and daycare (6) to the five percent significance level and ten percent significance level respectively. These IV estimates indicate that female political representation have a positive impact on overall social spending and spending within elderly care and health care.

7 Discussion

In this thesis, I aim to estimate the effect of female political representation on social public spending. I do so by using panel data on 22 OECD countries. I use both OLS and IV estimation, which provides estimates robust for different types of estimation issues. I obtain both significant and insignificant results. I therefore cannot say that my results are robust in finding that female political representation does affect social spending.

The OLS estimates without using time fixed effects indicate a significant relationship, in line with the IV estimates that do contain time fixed effects. However, when adding time fixed effects to the OLS regressions, virtually all estimates come out insignificant. Using time fixed effects brings a tradeoff between controlling for unobserved time effects, such as a world recession, and possibly absorbing actual variation due to the variable of interest. In order to obtain causal estimates, the regressors need to be strictly exogenous. Without using time fixed effects, this requires the error term that varies over time, ε_{it} , to be uncorrelated to the explanatory variables in the regression. This assumption is called the strict exogeneity assumption (Angrist and Pischke, 2009). If there is some sort of shock, say a world recession, this assumption fails. Since the data used in this thesis covers a significant amount of time, one can assume that the exogeneity assumption is not fulfilled. Therefore, the use of time fixed effects seems reasonable. However, using time fixed effect can also absorb the actual variation that is intended to be estimated. Since the countries in the sample are similar, all OECD countries, it is reasonable that the same trend, increased female political participation, is present in all countries. If this is the case, at least some of this variation could then be absorbed by the time fixed effects. This could be an explanation to why the significance disappears from my OLS estimations when adding time fixed effects.

The IV estimates come out significant and positive for several outcome variables, both when using quota and average female political representation in neighboring countries as instruments. These estimates are, in contrast to the OLS estimates, robust to including time fixed effects. The IV estimates when using the quota variable as instrument is somewhat weak to including time fixed effects. The results using the average female political representation variable imply that female political representation positively affects social public spending. The IV regressions fail to find a significant relationship between female political representation and spending regarding family policy and education for both instruments. Using the average variable, IV

estimation on these outcome variables becomes insignificant when adding time fixed effects. One should note, that the standard errors are not cluster robust. Therefore, these results should be interpreted with caution. In order for the IV method to give causal estimates, the exclusion restrictions must be fulfilled. As discussed in section 5, this restriction cannot be tested. Thus, one has to rely on intuition and logics in order to determine whether an instrument is proper or not. One could discuss whether a law on gender quota is directly correlated to public spending and therefore violates the exclusion restriction. It could be the case that as countries develop and grow richer, and increases their public spending in accordance with Wagner's law, they too start to implement development policies regarding equality, such as minimum wage laws or laws on gender quotas.

Going back to the theory presented in section 2, the failure to provide robust results might be due to the fact that the gender in itself does not have an impact on the actions of a politician. Of course, my results do not provide evidence of this, they simply cannot provide robust evidence of the gender actually having an impact. As discussed, there are some caveats with the OLS technique. The fact that I fail to find any significant results using OLS but do find some significant results using IV might indicate that OLS is not an appropriate method to estimate the effect of female political representation on social spending. Another possible explanation for the positive correlation between social spending and female political representation illustrated by figure 1 in section 4 is that the correlation is due to variables that are controlled for in the regressions. It could be reflections of the constituent groups' or a symptom of Wagner's law. These are all controlled for, and this might be a reason to the inconclusive results. Even if a politician's gender matter for what preferences they have, it might be the case that they are not free to let their personal preferences affect their behavior. It is likely that they are in fact very controlled by what the party line is, and vote accordingly. It could be interesting for future research to look into the gender composition in the party leaderships within respective parliaments to see if the gender composition in these groups matter. The representatives in the leaderships presumably have more power over what the party lines should contain. Thus, any personal preferences affecting actions may have a leverage effect in a party leadership, since they would then affect the actions of several representatives.

The regressions using the interaction between female political representation and political electoral system do not provide robust support for the theoretical reasoning of politicians in proportional electoral systems to have bigger possibilities to act according to their personal

preferences. This could partly be due to the data limitations. There was quite little variation in the sample regarding this, most countries had similar electoral systems, which poses a problem to identifying an effect.

Since there is not a vast amount of previous research investigating this question, it is hard to give a nuanced comparison of how my results relate to those of previous studies. Since I fail to find robust significant OLS results, my results are not in line with Seok Park (2017) who does conclude that there is a significant relationship between female political representation and social spending. Interestingly, we use the same data set, which would intuitively generate the same OLS results. However, this publication is not presented with a basis in economic theory, and I suspect that the different results might be due to my inclusion of time-fixed effects. Pande (2003), Chattopadhyay and Duflo (2004) and Svaleryd (2007) all find significant positive effects of female political representation on public policy, but these have a vastly different sample than I do. Bolzendahl and Brooks (2007), who do find effect of female political representation on public spending, also use OLS estimation, but with a slightly different sample which might explain the different results. However, my significant IV estimations support these previous results in concluding that female political representation have a positive impact on public policy.

In summary, I obtain inconclusive results regarding the impact of female political representation on social public spending. The OLS estimates become insignificant when adding time fixed effects, but the IV estimates show mostly positive and significant results, even when including time fixed effects. The inconclusiveness motivates further research on the area.

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Appendix 1

Table A1.1 Countries in sample

Country code	Country
AUL	Australia
AUS	Austria
BEL	Belgium
CAN	Canada
DEN	Denmark
FIN	Finland
FRA	France
FRG	Germany
GRE	Greece
IRE	Ireland
ITA	Italy
JPN	Japan
LUX	Luxembourg
NET	Netherlands
NZL	New Zealand
NOR	Norway
POR	Portugal
SPA	Spain
SWE	Sweden
SWZ	Switzerland
UKM	United Kingdom
USA	United States

Appendix 2

Table A2.1 Control variables used in respective regression

Social spending
Share of seats occupied by left-wing parties
Majority of seats occupied by left-wing parties
Share of seats occupied by christian parties
Log of total unemployment
Log of real GDP
Log of female labor force
Log of population
Elderly
Log of population over 65 years old
Family
Log of population under 15 years old
Daycare
Log of population under 15 years old
Education
Share of population with tertiary education

Appendix 3

Table A3.1 Average female political representation variable

Country code	Country	Neighbor 1	Neighbor 2	Neighbor 3	Neighbor 4
AUL	Australia	NZL	JPN		
AUS	Austria	FRG	SWZ	ITA	
BEL	Belgium	NET	FRG	FRA	LUX
CAN	Canada	USA	JPN		
DEN	Denmark	SWE	NOR	FRG	
FIN	Finland	SWE	NOR	DEN	
FRA	France	FRG	BEL	SWZ	ITA
FRG	Germany	NET	DEN	AUS	FRA
GRE	Greece	ITA	AUS	SWZ	
IRE	Ireland	UKM	FRA		
ITA	Italy	FRA	GRE	SWZ	AUS
JPN	Japan	AUS	NZL		
LUX	Luxembourg	BEL	FRA	FRG	NET
NET	Netherlands	BEL	FRG	DEN	
NZL	New Zealand	AUS	JPN		
NOR	Norway	SWE	DEN	FIN	
POR	Portugal	SPA	FRA	ITA	
SPA	Spain	ITA	POR	FRA	
SWE	Sweden	NOR	FIN	DEN	
SWZ	Switzerland	AUS	FRA	FRG	
UKM	United Kingdom	IRE	FRA	NET	
USA	United States	CAN	JPN		

Appendix 4

Table A4.1 IV first stage, instrument: quota, including country fixed effects

First stage	(1)	(2)	(3)	(4)	(5)	(6)	(7)
In regression with outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
Quota	12.0822*** (1.4493)	5.5803*** (0.8946)	4.2618*** (0.8521)	5.3144*** (0.9007)	5.2819*** (0.8701)	5.1738*** (0.8819)	0.4114 (2.4345)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	69.49	168.70	179.49	176.25	163.28	139.60	28.28
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	651	651	651	665	651	585	115
Number of groups	22	22	22	22	22	22	22
R-squared	0.0996	0.6849	0.7226	0.6895	0.7033	0.6940	0.7731

Standard errors in parentheses

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

Table A4.2 IV first stage, instrument: quota, including country and time fixed effects

First stage	(1)	(2)	(3)	(4)	(5)	(6)	(7)
In regression with outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
Quota	2.361*** (0.8385)	1.4938** (0.7523)	1.4735* (0.7522)	1.2663* (0.7618)	1.5372** (0.7509)	0.7422 (0.7407)	-2.4940 (2.1212)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	56.28	66.15	64.55	67.76	64.86	61.70	27.06
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	651	651	651	665	651	585	115
Number of groups	22	22	22	22	22	22	22
R-squared	0.7448	0.8096	0.8101	0.8098	0.8108	0.8212	0.8490

Standard errors in parentheses

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

Table A4.3 IV first stage, instrument: average female political representation, including country fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
In regression with outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
Avg FP	2.157*** (0.0688)	1.4329*** (0.0926)	1.2256*** (0.0981)	1.5796*** (0.081027)	1.4265*** (0.0935)	1.3305*** (0.0980)	0.9726*** (0.2314)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	981.56	243.60	229.99	251.77	221.96	190.78	36.05
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	651	651	651	665	651	585	115
Number of groups	22	22	22	22	22	22	22
R-squared	0.6098	0.7583	0.7695	0.7603	0.7631	0.7561	0.8318

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4.4 IV first stage, instrument: average female representation including country and time fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
In regression with outcome:	Social spending	Social spending	Elderly	Health	Family	Daycare	Education
Avg FP	0.3393*** (0.1224)	0.6475*** (0.1137)	0.6402*** (0.2240)	0.6396*** (0.1147)	0.6325*** (0.1141)	0.3794 (0.1238)	(0.4495) (0.2893)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	56.25	70.06	68.27	71.66	68.43	62.90	27.48
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	651	651	651	665	651	585	115
Number of groups	22	22	22	22	22	22	22
R-squared	0.7446	0.8183	0.8186	0.8182	0.8190	0.8240	0.8510

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1