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Public Expenditures on Family-Specific Benefits, Governance and Child Health Outcomes

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Curriculum Vitae

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7. O. Ozdamar "Good Governance, Parental Benefits and Child Health Outcomes". 2013 Conference of IPSA RC 20 Political Finance and Political Corruption. Paris, France, 9-11 July 2013.

Contents

Curriculum Vitae **iii**

List of Figures **ix**

List of Tables **xi**

Abstract **xiii**

1 Introduction **1**

2 The Relationship Between Public Spending on Parental Leave Benefits and Child Health Outcomes **10**

2.1 Introduction 10
2.2 Overview of Parental Leave Policies across OECD Countries 13
2.3 Economic Theory and The Prior Research on Parental Leave Policies and Child Health 15
2.4 Data Description 20
2.5 Econometric Model and Methods of Analyses 30
2.6 Results 35
2.6.1 Preliminary Results: Relationship Between Public Spending on Parental Benefits and Child Mortality Rates 35
2.6.2 Robustness Check: Female Educational Attainment 44

3 Female Political Representation, Political Responsiveness and Child Health Outcomes **48**

3.1 Introduction 48

3.2 Prior Research and Theory 53
3.2.1 Previous Literature 53
3.2.2 Theory 55
3.3 Data and Empirical Specification 59
3.4 Results 62

4 Does Gender Matter?Female Political Representation and Public Spending on Family Allowances 69
4.1 Introduction 69
4.2 Theoretical Background 72
4.3 Prior Research 77
4.4 Data Description, Econometric Model and Empirical Results 82
4.4.1 The Relationship Between Female Parliamentary Representation and Public Spending on Family Allowances 83
4.4.2 The Relationship Between Female Critical Mass in Parliaments and Public Spending on Family Allowances 89
4.5 Empirical Robustness 96
4.5.1 Does voter turnout matter? 97
4.5.2 Does cabinet composition matters? 99
4.5.3 Does electoral fractionalization matter? 100
4.5.4 Does legislative fractionalization matter? 100
4.5.5 Do constitutional structures matter? 101

5 Conclusions 112

A Parental, Maternity and Child Care Policies in OECD Countries 118
A.1 The Definition of Parental, Maternity and Child Care Policies 118
A.2 Maternity, Parental and Child Leave Schemes in OECD Countries 119

B Data Sources and Definitions for Chapter 1 and Chapter 2 129
B.1 Independent Variables 129
B.2 Dependent Variables 131

C Public Spending on Maternity Leave Benefits and Child Health Outcomes across OECD Countries **133**

C.1 Public Spending on Maternity Leave Benefits and Child Health Outcomes across OECD Countries 133

D Overview of Family Allowances and Other Social Welfare Policies in OECD Countries **139**

References **158**

List of Figures

1 Public Spending on Parental Leave Benefits (as a % of female wages in manufacturing) across OECD Countries (1970-2010) 26

2 Neonatal Mortality Rates across OECD Countries (1970-2010) 28

3 Postneonatal Mortality Rates across OECD Countries (1970-2010) 28

4 Under-Five Mortality Rates across OECD Countries (1970-2010) 29

5 Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Child Health Outcomes . . . 29

6 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Neonatal Mortality Rates 35

7 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Postneonatal Mortality Rates 36

8 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Under-Five Mortality Rates 36

9 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Neonatal Mortality Rates 37

10 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Postneonatal Mortality Rates 37
11 Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Under-Five Mortality Rates 38

12 Relationship between public spending on parental benefits (as a % of female wages in manufacturing) and infant mortality outcomes 51
13 The Relationship Between the Interactive Governance Term and Neonatal Mortality Rates 62
14 The Relationship Between the Interactive Governance Term and Postneonatal Mortality Rates 63
15 The Relationship Between the Interactive Governance Term and Under-Five Mortality Rates 63

16 Percentage Share of Female Parliamentarians and Public Spending on Family Allowances (% of GDP) 88
17 The Fraction of Female Parliamentarians across OECD between 1980-2008 95
18 Public Spending on Family Allowances as a % of GDP across OECD between 1980-2008 96

List of Tables

1 Summary statistics 25
2 Results of the panel unit tests (H_0: Unit root in first difference) 33
3 Results of the panel unit tests (H_0: Unit root in first difference) 34
4 Relationship Between Parental Leave Benefits and Child Health Outcomes 39
5 Relationship Between Parental Leave Benefits and Child Health Outcomes 42
6 Robustness Check: Relationship Between Parental Leave Benefits and Child Health Outcomes 46

7 Summary statistics 60
8 Political Responsiveness: Female Political Participation, Parental Leave Benefits and Neonatal Mortality Outcomes 66
9 Political Responsiveness: Female Political Participation, Parental Leave Benefits and Postneonatal Mortality Outcomes 67
10 Political Responsiveness: Female Political Participation, Parental Leave Benefits and Under-Five Mortality Outcomes 68

11 Summary statistics 84
12 The Percentage Share of Female Parliamentarians and Public Spending on Family Allowances across OECD Countries 104

13 Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances 105
14 Female Political Representation over the 15% Female Critical Mass Threshold and Public Spending on Family Allowances 106
15 Female Political Representation over the 20% Female Critical Mass Threshold and Public Spending on Family Allowances 107
16 Female Political Representation over the 25% Female Critical Mass Threshold and Public Spending on Family Allowances 108
17 Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - First Sample 109
18 Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - Second Sample 110
19 Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - Third Sample 111

20 Summary statistics 135
21 Relationship Between Maternity Leave Benefits and Neonatal Mortality 136
22 The Relationship Between Maternity Leave Benefits and Postneonatal Mortality 137
23 Relationship Between Maternity Leave Benefits and Under-Five Mortality 138

Abstract

Lower child mortality may imply a higher rate of return to education, namely investments in human capital which is the prime engine for the economic growth. As Noble-laureate Amartya Sen convincingly argues that child mortality is an important indicator of economic success since being alive is already a necessary condition for our capabilities and it is helpful in the formulation of the public policy decisions. In other words, it is a good measure to understand how governments are successful and effective in public resource allocation(Sen98). Public spending on family-specific benefits are one of the public social welfare programmes which are implemented with distributional concerns. They are mainly designed to support families for childbearing and childrearing activities (e.g childcare, schooling). The two most important public spending categories amongst family-specific policies are *family allowances* and the *parental leave benefits*. Family allowances and the parental leave benefits are mainly designed for the children's well-being and the quality of life. This dissertation touches on the links between family-specific policies, the governance of public resource allocation and the child health outcomes across OECD countries.

The dissertation is composed of three main chapters.

Chapter 2

Chapter 2 sheds light on the relationship between public spending on parental leave benefits and child health outcomes-proxied with the infant and under-five mortality rates- across OECD countries. Parental leave benefits are

government-funded entitlements which are paid at a rate when parents are entitled to a leave period to care for their newborn or young children. Parental leave benefits are often a set proportion (wage replacement rates) of previous earnings. Replacement rates vary across countries. Similar to some prior literature which focuses on the association between public spending and development outcomes, overall findings explain a surprising result that public spending often does not yield the expected improvements in development outcomes. The main finding of this chapter reveals that there is no evidence for a significant relationship between parental leave benefits and child health outcomes OECD countries.

Chapter 3

The preliminary result on the lack of a relationship between public spending on parental leave benefits and child health outcomes may questionize the efficacy of the public resource allocation amongst social policy areas. Over the last three decades in the OECD area, public spending on parental benefits is one of the programmes with the low level GDP share. The reason behind this lack of a relationship between parental leave benefits and child health outcomes might be the insufficient allocation due to the crowding out effect of traditional social polices (e.g pensions, old-age) on new policies (e.g childcare). The population structure is a key driver of social welfare spending allocation across OECD countries where the big part of the social spending goes to the elderly population. According to the latest statistics of the OECD "Social Expenditures Database" (2009), overall total social welfare spending is estimated as 22% of GDP where spending on old age benefits and pensions are accounted for 11% of GDP. Compared to the old-age benefits and pensions, OECD countries redistribute less amount of their GDP towards family-

specific benefits. The share of the parental leave benefits was only 0.3% of GDP in 2009, while it was as high as 0.14% in 1980(OEC13f). This might be a rational response of vote-seeking politicians, since the population of many OECD countries are getting older, and voters over fifty are those with the greatest propensity to vote. It is the case where Down's(1957) benchmark model of democracy applies. It is characterised by complete policy commitment, policy choices reflect the preferences of the median voter. However, in policy making electorally accountable governments often fail to reflect the interests of the disadvantaged groups of race, gender, class(Pan03). In contrast to Down's Median Voter Theorem, more recent "Citizen Candidate Models" assign a role for the preferences of politicians. Following "Citizen Candidate Models", there is a significant amount of research which has emphasized that preferences of female politicians matter in family-specific policy making which directly reflects women's interests. It is often emphasized in the literature that women are more likely than men to invest in children and favour redistribution and they often give priority to public policies related to their traditional roles as care givers in the family.(Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05). In consideration of the persistent female under-representation and unfavourable reseource allocation towards parental leave benefits, Chapter3 has examined the link between female political representation, parental leave benefits and child health outcomes. The main finding supports the fact that low level of female political participation might be relevant for the insufficient resource allocation towards parental leave benefits.

Chapter 4

The findings of the chapter3 can be interpreted in three ways; a) Once female political representation reaches a cer-

tain threshold in terms of bargaining power in policy-decision making, the interaction of female political representation and parental leave benefits would be significant on child health outcomes. b) However, the irrelevance of the interaction between parental leave benefits and female political representation on child health might not only be driven from the female under-representation in politics. b) Alternatively, the preferences of the woman who have been involved in policy decision could be closer to the preferences of their male collegues or to the interests of parties that they belong into. Therefore, female politicians who had been in the parliaments over forty years, might not really represent the preferences of women's citizens. c) Moreover, they might have even no preferences on a specific resource allocation. In other words, the relevance of female politicians on the lack of a relationship between parental leave benefits and child health outcomes would be consistent with the Median Voter Theorem which assumes that policy decisions only reflect the preferences of the median voters, therefore the gender of the politician does mot matter for policy decision making.

The third chapter, therefore, investigates whether female politicians play a role in policy-making which reflects women's interests. To see the relationship between female political representation and family-specific policies from a broader view, I choose public spending on family allowances as the main field of the interest. Public spending on family allowances is one of the other family-specific social policy which play an important role in helping families for the childcare and child raising as well. Following the previous literature on *critical mass*, I identify four different thresholds which are equal to 15, 20, 25 and 30 per cent of female seats over the total parliamentary seats. Afterwards, I test for the existence of a critical mass threshold across OECD countries in order to examine whether the number of women at a certain threshold

translates into more public spending on family allowances.

Overall findings of the chapter3 may be driven by the fact that the fraction of female parliamentarians in OECD countries have not been sufficient for a possible gender effect in policy-making on family allowances. In other words, women's representation needs to reach a certain critical level to make an impact on the policy decision process. In fact, the fraction of female politicians is above a certain threshold (30%) shows a significantly different allocation of public spending on family allowances. Even though the overall thesis does not aim to support whether all those relationships are causally evident or not, the entire results are robust to using various different indicators for child mortality (neonatal, postneonatal and under-five mortality), to the inclusion of additional covariates and to different econometric specifications.This result suggests that the persistent under-representation of women in OECD parliaments might still be an obstacle for their efficiency in policy decision making on family-specific benefits. The problem of equal opportunities in entering to politics can be one of the reasons for the lowest rate of female participation in politics. By 2013, gender inequality in political participation across OECD countries still exist that there is no country which has reach to equal participation of women and men into politics. Sweden is the only country among OECD countries where male and female parliamentarians have nearly equal representation with 44.7% of female seats in the parliament. Moreover, the percentage share of the female seats are still less than one-third in 23 out of 34 countries across OECD.

Chapter 1

Introduction

Most of the studies in the field of economics focus on the child health and mortality for two main reasons: a) First, child health has long-term impacts on labor productivity b) Second, they are important indicators of the success of the government policies and public spending allocations(Sen98; CM99). Empirical evidence also previously emphasize that public spending often does not yield the expected improvement in child health outcomes and the efficacy of public spending is largely explained by the quality of governance. One of the essential prerequiste of the governance for the effective and fair redistribution is the participation of the citizens from different groups to policy making. Different voices in public policy making leads to a resource allocation concerning the preferences of all citizens irrespective of gender, class and race. Due to the persistent gap between women and men in the political arena, particularly female political participation in policy-making has emerged as a global issue all over the world. Preference differences between men and women identified in numerous setting and (Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05) empirical evidence also suggest that women are more likely than man to favour redistribution and support policies such as spending on child care and other child related expenses.Therefore, female political representation is considered as an important factor in the formulation of policies which rep-

resent women's preferences. This dissertation studies the link between public spending, governance, and child health outcomes where the main outcome of interest is family-specific policies (parental leave policies and public spending on family allowances) which mainly target women and children.

Content of the dissertation

Public spending on parental benefits are the cash payments allocated to families, especially for the mother's use, during the pregnancy or immediately after the birth of the child. Although public spending on parental leave benefits across OECD countries are the policies exactly designed to support families for pediatric health, chapter 2 reveals that there is no evidence for a significant relationship between public spending on parental benefits and child health outcomes. The interpretations on the main results can be done as following: a) First, child health might mostly depend on the parental behaviors (e.g hygiene, nutrition) or unobserved genetical factors. b) Second, evidence might point out a economic failure which is the insufficient resource allocation towards parental leave policy area. Following the related literature(Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05) which emphasize that the preferences of women are more likely to be interested in investing in children, this economic failure might also refer to a political failure where insufficient allocation can be explained by the underrepresentation of women in public-policy making. The basic premise of representative democracy indicates that irrespective of class, gender or race, the equal representation of citizens in politics is essential for formulating the public spending allocation based on their interests because policies by electorally accountable governments often fail to reflect the interests of different groups(Pan03). On the other hand, following "Representative Democracy Model (Citizen Candidate Model)" of (BC97), there is sufficient amount of research has emphasized the importance of female identity and own preferences of politicians in policy-making which directly reflects women's interests and preferences.

Correspondingly, chapter 3 focuses on the link between public spend-

ing on parental benefits, female political representation and child health outcomes. The empirical results presented in the third chapter supports the notion that the interaction of female political representation and public parental benefits over forty years across OECD countries, have not played a significant role on child health outcomes. In other words, female political representation in OECD countries -proxied with the percentage share of female seats in national parliaments- has not been efficient in the decision making of resource allocation towards parental leave policies over the last forty years period. The result on this insignificant relationship might be explained in three ways: a) Due to the persistent female under-representation (OECD-34 average is 19.9% and %26.8 in 2009 and 2012 respectively) over years, the bargaining power of female politicians might have not been enough for being important in decision making on the public spending allocations to parental leave policies. b) Alternatively, the preferences of the female politicians involved in policy-making may be close to those of their male colleagues. c) Lastly, the gender of the politician might not matter in the redistribution decisions of social welfare spending across the OECD area. It is simply what Down(1957)'s Median Voter's Theorem suggest where politicians' preferences and personal characteristics do not matter in public policy choices.

In consideration of the results in chapter 3, chapter 4, therefore, has focused on the role of female politicians on policy-making which reflects women's interests. I choose public spending on family allowances as the main field of investigation in order to see the relationship between female political representation and family-specific policies from a broader view. My preference in this subject has also been influenced by the availability of the dataset on family allowances drawn many countries that have recently joined the OECD to control cross-country heterogeneity. Public spending on family allowances is one of the other family-specific social policy components which play an important role in helping families for the childcare and child raising as well. The estimation results based on different samples and various econometric frameworks show that the number of female parliamentarians has not been significantly relevant on the redistribution towards public family allowances over the forty years

across OECD area. In particular, public spending on family allowances which is associated to women's preferences, such as childcare and child raising, has not benefited from the representation of women in OECD parliaments. Considering this finding, I have tested whether the reason for this insignificance is the persistent under-representation of women in politics. It is possible that when the percentages of elected female politicians exceeds a remarkable value or a critical mass threshold, they would be relevant in policy decision making. Following previous literature on critical mass, I identify four different thresholds equal to 15, 20, 25 and 30 per cent of female seats over the total parliamentary seats. Afterwards I test for the existence of a critical mass threshold across the central parliaments of OECD countries for examining whether the number of women at a certain threshold translates into more public spending on family allowances.

Research questions

To summarize, this dissertation aims at dealing with the following research questions:

1. Is there a relationship between public spending on parental leave benefits and child health outcomes across OECD countries? (Chapter 2)

2. Considering the economic failure in the insufficient allocation of parental leave benefits, does the underrepresentation of women drive this result as a political failure? (Chapter 3)

3. Does female political representation of women matter for the public spending on family allowances? (Chapter 4)

Main results

The empirical evidence related to the previous set of research questions of each chapter is summarized as follows.

The first results support the fact that public spending on parental benefits has not been relevant for the decreasing trend of child mortality rates across OECD countries over the forty years. This evidence is robust to performing different estimation techniques (including Arellano-Bond GMM), using different indicators for child mortality rates (neonatal mortality, postneonatal mortality, under-five mortality) and controlling additional covariates. I have also performed a robustness check using female education attainment as a proxy for the maternal education. To begin with (Cal79), many authors have emphasized on the association between mother's education and child health[1]. However, no cross-country parental leave policy literature has dedicated consideration on this issue due to the data unavailability so far. Using a new dataset ("Educational Attainment and Child Mortality Estimates by Country (1970-2009") which is launched in 2010 by IHME at University of Washington, I have evaluated the contribution of female educational attainment to the robustness of the main findings. Main findings remain same but female education has showed positive significancy on child health outcomes with some different estimation methods. The results on the significance of maternal education might indicate that more education helps women make better choices in childbearing and childrearing approaches (e.g hygiene, nutrition). Nevertheless, some caution is necessary in interpreting the results. First, once stationary of the variables are provided by first differentiating the findings do not provide any significant evidence for a positive relationship between maternal education and child health outcomes. On the other hand another caution is necessary for a causal inefficiency of parental leave benefits or causal efficiency of maternal education on child health outcomes. Such an inefficiency might be present but should be

[1](Sch84) posits five possible explanations in his general framework for the analysis of mortality. First, education may increase the productivity of health inputs. Second, it may reduce costs of information about the optimal use of health inputs where educated mothers may be advantageous in searching out such information. Third, education may increase family income. Fourth, education may increase the mother's time costs which would serve to decrease child health. Fifth, education may change preferences for family size and therefore child health.

supported with a strong instrumental variable estimation[2].

Chapter 3

The last interpretation of the previous chapter raises one important question: how efficient is representative democracy in social-policy making across OECD countries? Looking at the trend of social welfare expenditures over the last forty years across OECD countries, the highest share of the old-age benefits compared to family-specific spending is not suprising since the majority of the population are elderly and the population structure is a key driver of social spending, much of it goes to the old-age benefits and pensions. This might be a rational response by politicians across OECD countries where voters over fifty are those with the greatest propensity to vote. According to Down's (1957) benchmark democracy model (Median Voter Theorem), political decisions only reflect the preferences of the median voters, since the majority of rule voting system will determine the prefered outcome of the median voter. However electorally accountable governments often fail to reflect the interests of disadvantaged groups such as women, poor or ethnic minorities(Pan03). On the other hand, following the "Representative Democracy Model" of (Besley and Coate,1997), prior studies have pointed out on the role of female identity of politicians which matters on family-specific policy out-

[2]For IV strategy, related literature on the efficiency of public policies on child health outcomes mainly used "legal origins" as an exogeneous instrument which shows the type of legal system that countries belong into such as common law, German civil law, Scandinavian civil law, French civil law etc. However my first-stage statistics of the 2SLS regressions indicate that "legal origins" is a weak instrument in this context. IV estimators are likely to be biased once weak instruments are used. Secondly, legal origins themselves may affect the related outcomes through channels other than parental leave benefits. (AJ05) also point out few shortcomings in the use of this instrument in terms of framework which violates exclusion restrictions. Considering the existing literature which suggests that Scandinavian origin countries are sharply more interventionist similar to that socialist countries, they may have a greater interest in state expansion with social welfare policies than common law countries. On the other hand, it can be expected that civil law countries, in part because of their commitment to equality, might redistribute more on health to reduce infant mortality among poors(LPLdSSV99). Therefore, using legal origins as IV estimators can be severelly biased and imprecise in this setting. Thus, this paper avoids making causal claims on the efficiency of parental leave policies on child health outcomes.

comes that directly target women and children[3]. It is often emphasized in the literature that women are more likely than men invest in children and they give priority to public policies related to their traditional roles as care givers to children(Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05). On the other hand parental leave policies are launched for supporting families (especially mothers) in childcareing. In other words, the interaction between parental leave benefits and women's political underrepresentation[4], over forty years across OECD countries would be the driving factor for the insignificant relationship between parental leave benefits and child health outcomes. The secondary result of the thesis supports the fact that the female political representation has been relevant for the lack of a relationship between public spending on parental benefits and child health outcomes.

Chapter 4

Considering the last finding in chapter 3, chapter 4 has examined whether the persistent political under-representation over years has been the reason for the irrelevance of female political representation on policy making in favor of family-specific policies. Using public spending on family allowances as a main field of interest, it has showed that the interaction of correspondent public spending and female political representation can have a positive relationship with child health when female parliamentarians reach a given critical mass threshold in terms of bargaining power in policy-decision making and on the redistribution of resources among social welfare policies.

Contribution to the literature

This last section of this introductory chapter aims at stressing the contributions to the economic literature of the current dissertation chapter-by-chapter.

[3]For the detailed information see:Chapter 4.

[4]At the end of the 2000s, the average percentage share of female seats across OECD parliaments has been only 19.9%

Chapter 2

The economic empirical literature of the cross-country relationship between parental leave policies and child health outcomes has focused on the efficacy of parental leave period (as the number of weeks that parents are allowed to leave their job before or after the child birth.). However no cross-country analysis has been performed on the relationship between public spending on parental leave benefits and child health outcomes. The second contribution of the chapter is the use of a recently published data on female educational attainment. Although individual level studies up to now have mostly emphasized on the role of maternal education in reducing child mortality rates, the only dataset of (BL12) based on quinquennial observations has not been enough to control maternal education in such a macro level study related to parental leave policies. This paper controls for maternal education using the recent (2010) annual dataset on female education gathered by IHME (Washington University Institute for Health Metrics and Evaluation).

Chapter 3

The main contribution of chapter 3 is to analyze the role of female political representation on the link between public spending on parental benefits and child health outcomes. In this aspect, there is no any previous study which analyzes the role of any governance component on the relationship between parental leave benefits and child health outcomes. Prior cross-country research has focused on the health care or education expenditures rather than parental leave policies and none of these studies have considered female political representation as a link for the efficacy of the public spending on development outcomes. The governance components that have mostly received dedicated consideration are corruption level and bureaucatic quality rather than participation (or representation). This paper contributes to this strand of literature considering female political representation as a link between parental leave benefits and child health outcomes.

Chapter 4

The contribution to the economic literature of chapter 4 is to use the public spending on family allowances as the main field of interest. Prior research that seeks to understand the relationship between female political representation and public spending has dedicated attention on the other social welfare policy areas such as health and education. On the other hand no comparative study has been tested the research question with different subsamples to deal with the cross-country heterogeneity bias in family allowances and female political representation. There are some traditional OECD countries which are for long at the top of the list of an established rank order of countries according to the fraction of female parliamentarians. Their high level women's political representation role may translate into more spending on female allowances considering women's preferences relative to countries that have recently joined the OECD. This raises doubt about whether traditional OECD countries are driving the positive relationship between women's political representation and public spending on family allowances. I therefore examine the relationship between women's political representation and public spending on family allowances both excluding and including these new OECD countries with different subsamples. On the other hand, to analyze the role of critical mass issue on the relationship between female political participation and family allowances is the first attempt by this paper in the relevant literature. As a common contribution of all chapters ; there has been no study in the related cross country literature which checks the robustness of the results using different econometric frameworks such as Arellano Bond (GMM) or Prais-Winsten (AR(1)) estimation to deal with autocorrelation and contemporaneous correlation.

Chapter 2

The Relationship Between Public Spending on Parental Leave Benefits and Child Health Outcomes

2.1 Introduction

Child mortality rates are the best indicators of overall health status of countries and as Amartya Sen's Capability Approach strongly argues that mortality is an indicator of economic success since being alive is a necessary condition for our capabilities(Sen98). Considering it's importance in social and economic progress, prior studies have attempted to examine the determinants of child health[1]. Cross-country studies of child health especially focus on some determinants associated with the social modern-

[1]In this study, I use child health as a generic term to refer two different types of child mortality rates which are infant mortality and under-5 mortality rates. Infant mortality rate refers to total number of infant deaths under one year of age per 1,000 live births. It has two components as follows; a-neonatal mortality rate (total number of infant deaths under twenty eight days of age per 1,000 live births) and b-postneonatal mortality rate (total number of infant deaths between twenty eight days and one year of age per 1,000 live births). Under-five mortality rate refers to total number of child deaths under five years of age per 1,000 live births(Ruh00b).

ization theory(Lip59), such as economic growth, education and fertility. On the other hand, public health expenditure is another factor that prior research often investigate its relationship with child health outcomes.[2]. However, no previous cross-country evidence has up to this point analyzed the relationship between public spending on parental leave benefits and child mortality rates across OECD countries. Parental leave policies are one of the important economic policies that OECD countries use to support families for their efforts to care for newborns or young children. The components of parental leave policies is twofold; a) duration component: job protected leave as the number of weeks after or before the child birth b) spending component: financial support as cash benefits during the parental leave period. Parental leave benefits are the public financial supports for individuals who are pregnant, have recently given birth, or are caring for a child. Considering this fact, parental leave benefits are more specific in terms of targeting child health than public health expenditures that are undertaken to achieve different health care goals within a society.

The primary aim of this paper, therefore, is to contribute to this strand of the literature by analyzing the relationship between public spending on parental leave benefits and child health outcomes. Although there has been no evidence so far for the spending component of parental leave policies, the child health effect of parental leave duration (as the number of weeks) is analyzed by previous studies and related research have

[2]The motivation behind the number of former studies has been to understand whether public health expenditure in OECD countries is effective on improved child health outcomes. The cross-country empirical evidence on the link between public health expenditures and child health outcomes is so far mixed with positive, negative or insignificant results. For instance, (Leu86) could not obtain any significant relationship between health expenditures and child mortality rates after controlling for income.(HP92) have found a weak relationship between health expenditures and infant mortality rates.Similarly(FP97) have showed that public health expenditure account for less than $\frac{1}{6}$ percent of all variation in infant mortality, while income alone account for 84 percent of the entire variation. The result on the inefficiency of public health expenditure on infant mortality has been repeated by (DW99) as well. Based on a dataset for 117 countries,(KM92) have emphasized on a little contribution of the health resources in health status compared to the other socioeconomic factors.(CP95)'s finding indicates that income is a vital determinant for health outcomes but public health expenditure does not show any significance on child health. In contrast to those studies, (Hoj96), (BR97), (AR93) have reinforced the idea that public health expenditure has a statistically significant effect on child health outcomes.

obtained heterogeneous results[3].

This paper has performed some analyses by expanding the cross-country literature on parental leave policies and child health outcomes in a way as following;

- The database is geographically widened to 22 OECD countries.The period of time has been extended to 2010 to account for the recent developments in parental leave policies which have occurred after 2000[4]

- In contrast to prior research which focus on the parental leave durations and child health outcomes, this paper examines the role of parental leave benefits on child health outcomes.

[3]Based on a cross-country data for 17 OECD countries (WB95) have found a 2% -3% decline in infant mortality rates once parental leave duration increases an extra week.(BHW05) have found considerable associations between a mother's early returns to work and reductions into breastfeeding and immunisations. Using data for 16 OECD countries, from 1969 to 1994,(Ruh00b) has empirically showed the positive effect of an increase in the lenght of parental leave duration on child health outcomes. Similarly, extending (Ruh00b)'s dataset from 1995 to 2000, (Tan05) has found a significant decreases in child mortality rates with increasing weeks in parental leave duration. Overall their results support the fact that longer periods of leave strength the child health outcomes. In contrast, (LS10) have examined the impacts of an enhacement from 12 weeks to 15 weeks in Swedish Parental Leave Scheme and found no impact on the child health outcomes.(Ros11) has analyzed the impacts of unpaid maternity leave policy of the US 1993 Family and Medical Leave Act (FMLA) on child health outcomes. She has found that the maternity leave duration has positive effects on child health outcomes as long as the mother have a family support or a secondary income during the leave duration. However she could not obtain any supportive evidence for the children of low-educated, poor and single working mothers. Analyzing the maternity leave entitlements in Canada,(BM10) has showed that maternity leave duration positively contributes to child development only up to two years of age. In addition to child health outcomes, prior research has focused on the effect of parental leave policies on the other child well-being indicators (e.g educational outcomes) as well. For instance, (DS12) have evaluated the impact of three major expansions (1979, 1986 and 1992) in parental leave scheme of Germany on the long run labor and educational outcomes of children. Apart from the positive contribution of 1992's maternity leave expansion on the high school attendance, they found no evidence for a significant relationship between expansions and the labor market or educational outcomes of children.

[4]Even though there has been no macro level evidence up to now for the spending component of parental leave policies and child health outcomes, the child health effect of the parental leave duration (as the number of weeks) is recently studied by (Tan05) which has extended (Ruh00b)'s paper until 2000 for 18 OECD countries. This paper investigates the relationship between parental leave benefits and child health outcomes across 22 OECD countries from 1970 to 2010.

- In addition to fixed effect methodology, which is the only technique used by the relevant existing cross-country literature, three more empirical strategies (including Arellano-Bond GMM estimator) are used to examine the robustness of results.

- Maternal education has been often considered as one of the determinants of child health in existing studies. Due to the unavailability of an annual dataset before 2009, previous cross-country studies of parental leave policies could not control for the maternal education. For the selection of other control variables, I follow previous literature on parental leave policies and child health outcomes. In addition to previous literature, using a new dataset which is launched in 2010, maternal education will be taken into account to investigate the robustness of results.

This paper is organized as follows: Section (2.2) provides a brief overview of the parental leave policies across OECD countries for which the detailed information has been presented in Appendix-A. Section (2.3) discusses the theoretical background of the relationship between parental leave policies and child health outcomes. Section (2.4) presents the data and variables. Section (2.5) specifies the empirical model and discusses the methods of analyses. Section (2.6) provides the results of empirical estimations and investigates their robustness.

2.2 Overview of Parental Leave Policies across OECD Countries

Governments, to address the challenges faced by parents and their children, often launch leave policies. Such policies are allocated for various lengths of time and paid at different replacement rates across countries[5]. Although these policies vary with respect to their concept and accordingly are called with different names (e.g maternity leave, parental leave, childcare leave), the common aim of the all leave policies are to enhance

[5]Replacement rate is defined as the ratio of parental leave benefits to the parents' earnings.

the child health. The most traditional leave policy is the maternity leave entitlements which has been intended only for women, related to pregnancy, childbirth and the first months of mothership. Women receive a propotion of their salary or an adequate allowance during the maternity leave period. The duration of leave, before and after the child birth, is generally between 14 and 20 weeks across the OECD. Some countries have considerably longer periods of leave such as Ireland (42 weeks), Greece (43 weeks) and the UK (52 weeks) where some weeks are unpaid(Mos10; Ray08). Maternity leave entitlement has a long history in the OECD area. The first maternity leave law was launched in Germany in 1833 and currently most of the OECD countries have statutory maternity leave policies except the United States. The United States is the only country which makes no national provision for a paid leave at the time of pregnancy and childbirth, though the possibility of unpaid leave conditionally exists for mothers[6]. Australia, Iceland, New Zealand, Norway, Portugal and Sweden do not have a maternity leave scheme but provide a paid leave for the woman under a common term of "parental leave entitlement". Apart from those few exceptional countries, since the 1980s, parental leave entitlements has been applied as an extended right taken just after the end of the maternity leave period. Parental leave entitlement is a type of employment guaranteed leave which is available for both fathers and mothers. Childcare leave entitlement is another type of leave given as a supplemantary leave immediately after the parental leave and much less common than parental leave.(Mos10; Ray08; Tan05).

In consideration of their common aim at enhancing child health, they may all play an important role for the child health outcomes. On the other hand, the distinction between these entitlements is often not possible in some countries where there is only one legislative framework for all types of leave. Overall thesis, therefore, uses "*parental leave benefits*" as a generic term which captures total public spending on all type of leave benefits including maternity, parental and childcare leave.

[6]Only five states (California, Hawaii, New Jersey, New York, Rhode Island) provide some payments to parents who are away from work at around the time of the child birth.

2.3 Economic Theory and The Prior Research on Parental Leave Policies and Child Health

In classical economic theory, households maximize utility over some consumption goods which are purchased in the market subject to a budget constraint. Becker (1965, 1994) developed this framework by assuming that households combine time and market goods to consume some basic commodities that directly enter their utility functions. For example, consuming a pizza is not valued only as the costs of buying it; one has to add the value of the time spent while consuming the pizza with her friends. Likewise, the utility of going to the cinema is not merely the price of the cinema tickets, but also the time spent enjoying the movie. Following (Bec65**?**), (**?**) developed the classical household production model where work at home as time use that generates services which have a close substitute in the market, while leisure has only poor market substitutes. (**?**) extended (**?**)'s model where they introduce so-called joint production that they define as housework also partly being leisure. (**?**) continue with the development of a household production model which explicitly deals with the problem of household activities which are partly work, partly leisure activities. Similar with the household production model on a certain consumption good, (RS82) has developed one of the first efficient economic theories on child health production by using; a) main perceptions from the model of "household production and consumption" by (Bec65), b) models on "health production" by (BP67) and (ALS69), and c) models of "demand for health care" by (Gro2b), (Gro82) and (Act75). Model assumes that family does not maximize the child health but the child health is one of the component of its utility and it is assumed to be produced.

This paper uses (**?**)'s idea on partly leisure partly work activities to include parental leave period and parental leave payments into (RS82)'s child health model. It is assumed that the production of the child health in a family requires additional time to spend for childrearing or childbearing activities like a usual work but at the same time it can be enjoyed by both partners in the family while spending time with the child.

The general framework for estimating the determinants of child health starts up with a health utility function where representative family gets satisfaction from the health status of child H as much as it gets from other consumption goods X. On the other hand family drives utility from the consumption of their own leisure L and from spending leisure time with the child as well. Therefore, the utIlity function of the representative family can be written as following;

$$U = U(X, H, L, h) \tag{2.1}$$

Model assumes that family does not maximize the child health but the child health is one of the component of family preferences while maximizing its utility. Child Health is assumed as produced by the family and is a function of time spent in childrearing (h).Namely, parental leave period might be considered as partly work and partly leisure. Therefore it takes place both in the family utility function and child health production function. On the other hand child health production is the function of health-related goods and services (M) which are bought by the family or allocated to the family by government (e.g immunization, hospital facilities, medicine, medical insurance). It is important to note that, other factors, which may not have direct but only indirect effects on the child health are not included into child health function. For instance, family income (including earnings, public social welfare allowances and benefits), maternal education, mother's employment can be effective on child health only through parental behaviors. For instance, maternal education may have effect on the child health if it is assumed that more education makes women more aware on parental behaviors (e.g hygiene, nutrition) or if it is presumed that more education may reduce the cost of an information about the optimal use of health inputs where educated mothers may be advantageous. Similarly, mother's employment that increase the mother's time at work would negatively reflect to the child health or would have positive effect on the child health through the additional income that women contributes to family budget. Similarly, family income (including public social welfare cash allowances and benefits) directly increase the amount of the money in the family budget but its effect on the

child health depends whether or not the additional money is used for the child health. Child health production function is described as follows;

$$H = F(M, \mu, h, \xi) \tag{2.2}$$

where F_m, F_μ, F_ξ $F_h \neq 0$.

$$Y = N + wR = P_x X + P_m M + s(wh) \tag{2.3}$$

Y is the total income and P_x; are the prices of consumption goods. P_m are the prices of the goods and services related to child health, R is the time spent at work, w is the wage rate and N represents non-earned income. It is assumed that both partners participate in the labour force. This assumption ensures that we have observation on total family income and parental leave benefits which are allocated by the government during the parental leave period for the family activities in child-rearing.

s is the wage replacement rate. At the same time it can be defined as the the opportunity cost of working or the shadow price of receiving the parental leave benefits[7]. Parents are entitled to receive parental leave benefits at this rate of their earnings. For instance if a mother earns 1000 Euros per month (wh) and if the wage replacement rate is 0.8, the parental leave benefits that mother is entitled to receive is 800 euros per month. $s = 0$ refers to an unpaid leave. Namely s is equal to percentage share of cash parental benefits in total earnings (The cash amount of parental leave benefits ($(s)wh$) = Total earnings (wh) * Wage replacement rate(s). (s) varies across countries and governments determine the level of wage replacement rates by law. For instance, in the United States there is no entitlement for a paid leave,namely $s = 0$ and therefore total parental benefits ($(s)wh$) that parents are entitled to receive during the leave pe-

[7]Following (RS82)'s model,(Ruh00b) developed a simple model where a family maximizes the utility function subject to a budget and child health production function. The utility funtion of the family is composed of the child health (H) and the other consumption goods (X). He includes both public spending on parental leave benefits and parental leave durations to this model considering their possible effect on the child health. He has assumed that parental leave benefits might increase the budgetary amount of a family and the parental leave duration makes parents away from work before or after the child birth

riod is zero.

After the maximization of the family utility function with respect to budget constraint, the first order maximization conditions are will be;

$$U_L = \lambda \tag{2.4}$$

$$U_X = \lambda P_x \tag{2.5}$$

$$U_h + U_H F_h = (1 + \lambda) sw \tag{2.6}$$

$$U_h F_m = \lambda P_m \tag{2.7}$$

The model yields four demand equations for the four different goods in terms of prices and income;

$$X = D_x(P_x, P_m, Y, \mu, sw) \tag{2.8}$$

$$M = D_m(P_x, P_m, Y, \mu, sw) \tag{2.9}$$

$$h = D_l(P_x, P_m, Y, \mu, sw) \tag{2.10}$$

The effects of price changes on the level of child health can be obtained using the first differentiation of the child health production function;

$$dH = F_m dM + F_\mu d\mu + F_h dh \tag{2.11}$$

The effect of the prices on child health might be formulated with the help of (2.11) whilst assuming that $\frac{d\mu}{dP_i} = 0$ where $i = x, y, z$.

$$\frac{dH}{dP_x} = F_m \frac{dM}{dP_x} + F_h \frac{dh}{dP_x} \tag{2.12}$$

$$\frac{dH}{dP_m} = F_m \frac{dM}{dP_m} + F_h \frac{dh}{dP_m} \tag{2.13}$$

$$\frac{dH}{dsw} = F_m \frac{dM}{dsw} + F_h \frac{dh}{dsw} \tag{2.14}$$

Equations suggest that wage replacement rate of the public spending on parental benefits as a percentage of earnings can be relevant for the child health. It is well-known that a rise in any price of a good will reduce the consumption of this good. For instance, an increae in P_x reduce the purchasing amount of X. However some of the above equations can-

not be predicted since the sign of fractions are not known such as $\frac{dM}{dP_x}$. The model thus points out that we cannot do a priori prediction for the relationship between the interactive governance term and child health outcomes. Following section analyze the issues econometrically. As explained above, M may refer various factors related to child health that may have direct effect on the child health such as immunization, hospital care used for the child, medical insurance, medical technology. They might be bought by the family or allocated by the government. These variables are controlled with total health expenditures, insurance coverage and medical technology in the econometric frameworks which take place in the following section. On the other hand, following the previous parental leave-child health literature and considering the fact that they may have effect on the child health through different channels, variables such as female employment and income are controlled as well even though they do not appear in the child health function of the theoretical model due to their indirect effect and for the simplicity in explanations. Moreover country-variant and country-invariant specific characteristics controlled with country fixed effects and country specific time trends for the ommitted bias problem due to other unobservables. In addition to ommited bias problem, the other source of the endogeneity might be reverse causation but it is important to note that this study does not aim to answer whether there is a causal correlation rather than a simple relationship.

Previous cross-country research has only focused on the effect of the leave duration component of the parental leave policies. This study contributes to this strand of the literature by analyzing the relationship between public spending on parental leave benefits and child health outcomes. Even though (Ruh00b) has included parental leave benefits in his model, he has not analyzed the relationship between parental leave benefits and child health outcomes. He only has focused on the effect of the parental leave duration (as number of weeks) on child health outcomes. Similarly, the economic model of (SLDD92) has remarked the importance of parental leave durations for the child health. This paper contributes to this strand of literature analyzing the relationship between parental leave

benefits and child health outcomes.

2.4 Data Description

The dataset[8] covers 22 OECD countries between 1970 and 2010, and includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States. The measure of public spending on parental leave benefits comes from (GB11), "Comparative Maternity, Parental, and Childcare Leave and Benefits Database" (1960-2010) which has data availability for only above-mentioned countries. Parental leave benefits are the cash payments which are paid during the parental leave duration. They are paid at a replacement rate of earnings. Thus, the replacement rate is equal to a ratio that is the percentage share of parental leave benefits in total earnings. The overall analyses in chapter2 and chapter3 use "Comparative Maternity, Parental, and Childcare Leave and Benefits Database" (1960-2010) which define parental leave benefits as a percentage of earnings, namely as replacement rates.

Following three measures are the main dependent variables of the investigation;

- The natural log of neonatal mortality rate : Total number of infant deaths under twenty eight days of age per 1,000 live births
- The natural log of postneonatal mortality rate : Total number of infant deaths between twenty eight days and one year of age per 1,000 live births
- The natural log of under-five mortality rate: Total number of child deaths under five years of age per 1,000 live births

The data on child mortality rates come from (IHM10b),"Infant and Child Mortality Estimates by Country (1970-2010)". The neonatal and

[8]For more information see: Appendix-B.

postneonatal mortality rates are the primary concerns of the paper due to their occurance at the most important period of the parental leave. ILO Convention (No. 183 and Recommendation No. 191 (2000)) on maternity protection recommends that a woman should be entitled to a time of maternity leave of at least 14 weeks. Almost all OECD countries have ratified the minimum duration of 14 weeks (which is the period includes both neonatal and postneonatal deaths) of paid leave as recommended by the International Labour Organisation (ILO). Since it is not an obligatory law and just a recommendation, the duration of the leave varies across countries. On the one hand, there are country schemes where parents are entitled to less than 14 weeks of leave. For instance, the United States has no legislation for a national paid leave, but it can be received as a unpaid leave for 12 weeks of duration. On the other hand, many countries grant leave entitlements that exceed this 14-weeks of period where parents are entitled to a leave of one year or even longer. For instance German families are allowed to receive 14 months of parental leave. In addition to neonatal and postneonatal mortality rates, I therefore also consider under-five mortality rates as the other main regressand, since it captures child deaths over one year of age as well.

Control variables is selected following existing literature on the parental leave policies and child health outcomes[9]. The first control variable, total health expenditures as a percentage of GDP, is obtained from (OEC13c), "Health Data: Health Expenditure and Financing". It is assumed to be negatively related with child mortality rates, because public or private investment on health care services might yield better child health outcomes[10]. However, the prior literature for the efficiency of health expenditures on child health outcomes have conflicting results(Hoj96; BR97; AR93; Leu86; HP92; FP97; CP95; DW99; KM92; RS08).

Furthermore, the data on real GDP per capita at constant prices in

[9]I especially follow (Ruh00b)'s study who has done the first most detailed work on parental leave policies and child health outcomes.

[10]Former research has preferred to control for only public health expenditures. This study considers the possible impact of private health care expenditures as well and use total health care expenditures as percentage of GDP.

2005 USD are collected from (HSA12), Penn World Table 7.1. It is assumed that a higher GDP might allow a country to allocate more money to health care services to invest child health outcomes. Similar to health expenditures, the results of prior research on the relationship between income and the child health is heterogeneous for industrialized countries. Some studies reveal a positive association (e.g.(Ett96)) while others obtain no effect (e.g. (Dul95)). (Ruh00a) even shows that child health might be negatively affected by short-lasting improvements in economic conditions. The econometric model also includes fertility rates (children per women aged 15 to 49 years old) by assuming that an increasing number of infant births might cause an increase in infant deaths by reducing available time and energy to invest in each individual offspring and increasing their likelihood of dying. (RW88) and (FSSJ92) suggest that fertility rates and infant deaths are positively correlated. The data on fertility rates is collected from (OEC13b), "OECD Health Data: Demographic References". Furthermore health insurance coverage has been used as an essential control variable which is assumed to be positively related with the child health. Unfortunately, there is no enough available data for the medical technology[11] which starts from the early period (1970) of analyses to use in such a cross-country setting. A number of other proxies of medical technology that have been mostly considered in the single-country literature are the surgical procedures and the number of specific medical equipments(BW98; Wei95). However cross-country data for those variables is incomplete for most of the countries. Although, the most of the observations are missing, (Ruh00b) proxied medical technology with dialysis patients per 100,000 population using extrapolation method. However this method should be preferred for the short-time span missing data and it is questionable how much this variable grows at a constant rate or it linearly changes. Some other papers have controlled the change in medical technology by adding country specific time trends(DM05), since medical technology is a time-variant variable. Prox-

[11]Medical technology is one of the important determinants which is assumed positively contributes to infant and child health in the previous literature. Advances in medical technology might reduce dramatically the risk of the mortality of the ill newborns and it is extolled for saving lives and improving health status of children.

ying medical technology with country specific time trends is the strategy that I have followed for the empirical estimations as well[12].The data on the share of the population with health insurance coverage is collected from (OEC13e), " Health Data: Social Protection". Additionally, overall analyses include female employment to population ratio and the data is collected from (OEC13a)"Employment and Labour Markets: Key Tables from OECD". Previous studies which focus on the effect of female employment on the child health have controversial results. One side of the literature claims that child health is affected by the employment of their mothers which might be positive due to additional earnings that the mother contributes to household income. On the other hand, the effect of female employment might be negative because of the time that she spends in the labor market might be more than the time that she spends at home for childbearing and childrearing[13].

I have also performed a robustness check using female educational attainment for 15-44 year old as an additional covariate. Beginning with (Cal79), many authors have emphasized on the assosciation between maternal education and child health.(Sch84) posits five possible explanations for the role of maternal education on the child health status. First, education may increase the productivity of health inputs. Second, it may reduce the cost of an information about the optimal use of health inputs where educated mothers may be advantageous in searching out such information. Third, education may increase family income. Fourth, education may increase the mother's time at work which would reflect to the child health negatively. Fifth, maternal education may change prefer-

[12]Following prior literature, all variables proxied for medical technology so far has highly incomplete data for a cross-country study on parental policies.The only variable is the "life expectancy" with complete data which (DR05) previously used as a proxy for medical technology. Once I replicated results using the life expectancy as the proxy for medical technology, overall results remain unchanged and the life expectancy shows highly negative significant coefficient as expected. However it is questionable whether it is a good proxy for medical technology in this setting. The life expectancy at birth might not reflect medical technological progress in general, since it is the exact inverse of the mortality rate at birth. The reason behind the negative significance of the variable might be the negative correlation between mortality rates at birth and the deaths at birth but not the advances in medical technology.

[13]For more information, see (BI03; Sta87; LEZ98; Eng93; BHW05; GWPB05).

ences on the birth control for the family size and therefore child health. Up to 2010, the only cross country dataset for female educational attainment was "A New Data Set of Educational Attainment in the World, 19502010"(BL12).Considering the fact that this dataset consists of quinquennial observations rather than annual observations, it has not been suitable for the parental leave literature due to the insufficient data of other variables for an estimation using a quinquennial dataset. The earliest data for parental leave policies start up in 1970 and most of the control variables are complete only for few number of countries before 1975 and even before 1980s. In 2010 (IHM10a) has published an annual dataset called as "Educational Attainment and Child Mortality Estimates by Country (1970-2009)" which includes annual observations for female educational attainment. This study, therefore, provides the most detailed investigation in cross-country settings to date of the relationship between parental leave policies and child health which includes maternal education as a control variable for the robustness of results.

Table 1: Summary statistics

	(1)	(2)	(3)
SAMPLES			
PANEL A1: Parental Leave Benefits and Child Health Outcomes (without controls)			
	Mean	**Std. Dev.**	**N**
The natural log of neonatal mortality rate	1.698	0.577	902
The natural log of postneonatal mortality rate	1.012	0.582	902
The natural log of under-5 mortality rate	2.21	0.561	902
Public spending on parental leave benefits	0.793	0.498	902
PANEL A2: Parental Leave Benefits and Child Health Outcomes (with controls)			
The natural log of neonatal mortality rate	1.533	0.484	540
The natural log of postneonatal mortality rate	0.854	0.495	540
The natural log of under-5 mortality rate	2.051	0.473	540
Public spending on parental leave benefits	0.843	0.46	540
The share of population with health insurance coverage	97.721	7.362	540
Total health expenditures as a percentage of GDP	8.040	1.486	539
Log(GDP per capita)	10.174	0.303	540
The female employment (aged between 15-64)/population ratio	0.581	0.109	539
The fertility rate (children per women aged 15 to 49 years old)	1.704	0.291	540
PANEL B: Robustnes Check Using Female Educational Attainment Aged Between 15-44			
	Mean	**Std. Dev.**	**N**
The natural log of neonatal mortality rate	1.554	0.474	525
The natural log of postneonatal mortality rate	0.873	0.487	525
The natural log of under-5 mortality rate	2.071	0.464	525
Public spending on parental leave benefits	0.84	0.462	525
The share of population with health insurance coverage	97.66	7.457	525
Total health expenditures as a percentage of GDP	7.974	1.446	524
Log(GDP per capita)	10.165	0.301	525
The female employment (aged between 15-64)/population ratio	0.579	0.109	524
The fertility rate (children per women aged 15 to 49 years old)	1.702	0.292	525
Female educational attainment aged between 15-44	10.559	2.047	525

Columns (1) of each sample show mean values which are the average values of observations with standard deviations represented in Columns (2). "N" stands for the number of observations in samples. The first sample at Panel (A1) used for the estimations which do not include any control variable. It is a balanced yearly panel data for 22 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States.) between 1970 and 2010. However, estimations with additional control variables are done using the sample which is represented at Panel (A2). This sample covers only 15 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Japan, the Netherlands, Norway, Portugal, Sweden, Switzerland, the United Kingdom) through the period from 1975 to 2010, due to the incomplete observations for some countries and years. The third sample at Panel B is used for the robustness check which has controlled female educational attainment aged between 15-44 as a proxy for maternal education. Since the data for female educational attainment ends in 2009, this sample covers only the period until 2009.

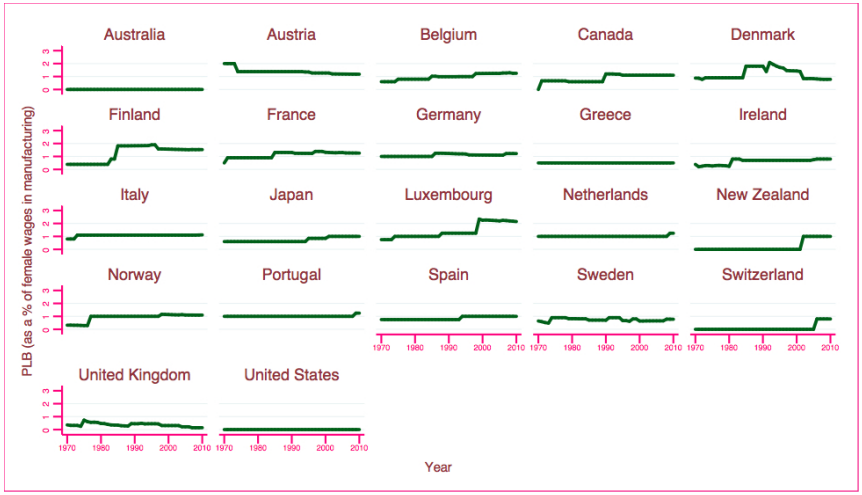


Figure 1: Public Spending on Parental Leave Benefits (as a % of female wages in manufacturing) across OECD Countries (1970-2010)

Panel (A1) in Table (1) compares a number of descriptive statistics of a complete data set for the public spending on parental benefits and child mortality outcomes from 1970 to 2010. The average public spending on parental leave benefits (as a percentage of female wages in manufacturing) is 0.79 with 0.498 standard deviation. Figure (1) shows the yearly variations in parental leave benefits from 1970 to 2010 for each country. The changes for each country are not frequent and of small magnitude in general, except Luxembourg and Belgium (Figure (1)). Austria and the United Kingdom are the countries which have followed a decreasing trend since the middle of the 1970s. The Netherlands, Italy, Greece and Portugal have almost have not undertaken any changes in replacement rates over years. Parental leave benefits in Sweden, Finland, Denmark have been decreased starting with the mid-1990s. One of the possible reasons of this decreasing trend might be the global recession which largely had effect on the financial systems of Nordic countries at the beginning of 1990s. Following this global recession, Nordic countries were forced into making deep budget cuts in social welfare

spending (e.g replacement rates were cut, services were cut and qualifying conditions for benefits were increased). The degree of the reduction in social welfare spending were smaller in Norway(EA96) compared to Denmark, Finland and Sweden. For instance, Sweden made major cutbacks in family-specific benefits in general and in parental leave benefits in particular. The benefit level was reduced from 90 percent to 75 percent during this period(FD10; LTP12). Both the benefits and the length of the parental leave were cut in Finland in the mid-1990s as well(LTP12). In the early 90s, social welfare spending became very costly after a decrease in GDP in Finland. In 1994, therefore, a number of reforms were introduced for some reductions in social welfare spending(Par96). France and Germany also have witnessed the decrease in parental leave benefits from mid-1990s to the late 1990s. During the recession of the early 1990s, GDP contracted for about two quarters in Germany and France as well(fEA09). Especially compared to the other countries, the Belgian reaction to crisis is defined as continuity and non-reaction. Indeed, the Belgian welfare expenditures did not decrease very much during the first half of the 1990s and parental leave benefits had even an increasing trend(SKvH11). The recent spending allocations to parental leave policies (even after the economic of 2007-2008) were comparatively much higher in countries since the character of these two economic crises (early 1990s and 2007-2008) have been different from each other. After the 2007-2008 crisis, up to now there have not been cuts in family benefits with the idea of a social support for the future generations.

On the other hand, all countries across the OECD have followed a decreasing trend in child mortality outcomes (Figure 2-4) from 1970 to 2010. In 2010, the minimum and the maximum values of under five mortality rate was 6.68 per 1,000 births in the United States and 2.68 per 1,000 births in Sweden where the United States is the only country which has no paid parental leave scheme for long time and Sweden's parental leave benefits are currently the most generous in the world even after the recession period in mid-1990s. Moreover, Figure (5) depicts an increase in average parental leave benefits and a decrease in average child mortality rates. However these explanations do not particularly enough to

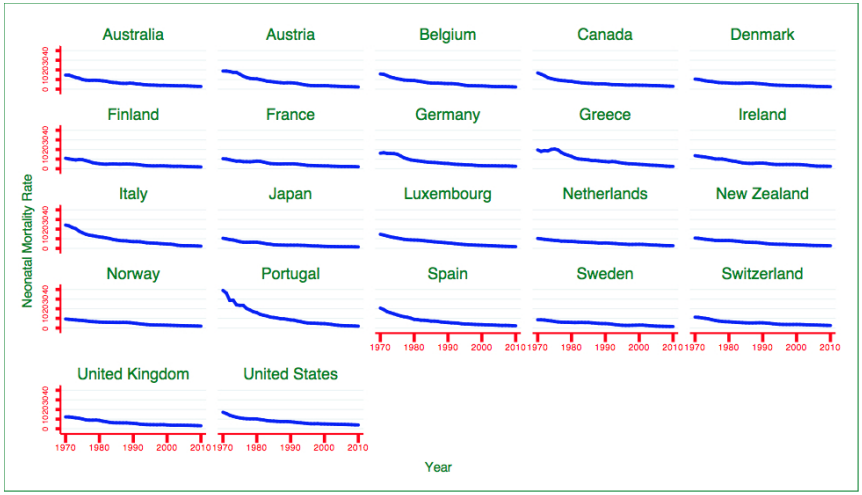


Figure 2: Neonatal Mortality Rates across OECD Countries (1970-2010)

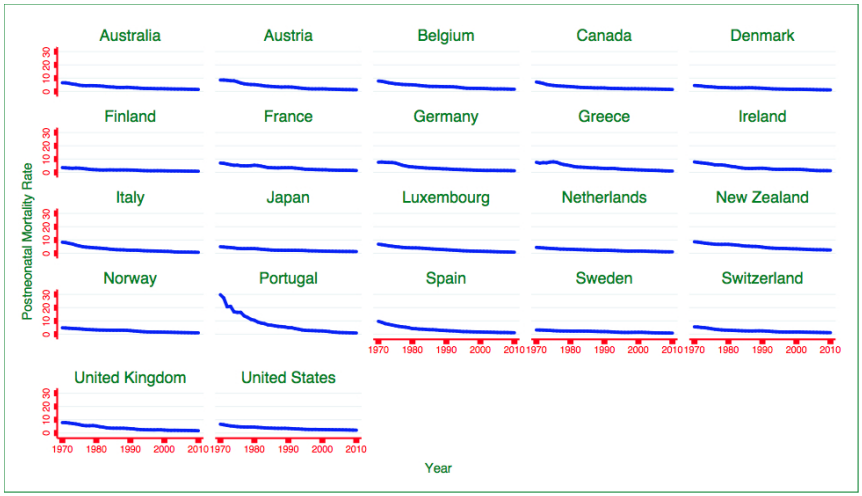


Figure 3: Postneonatal Mortality Rates across OECD Countries (1970-2010)

make predictions for a positive relationship between parental leave benefits and child health outcomes. Other country specific factors and the

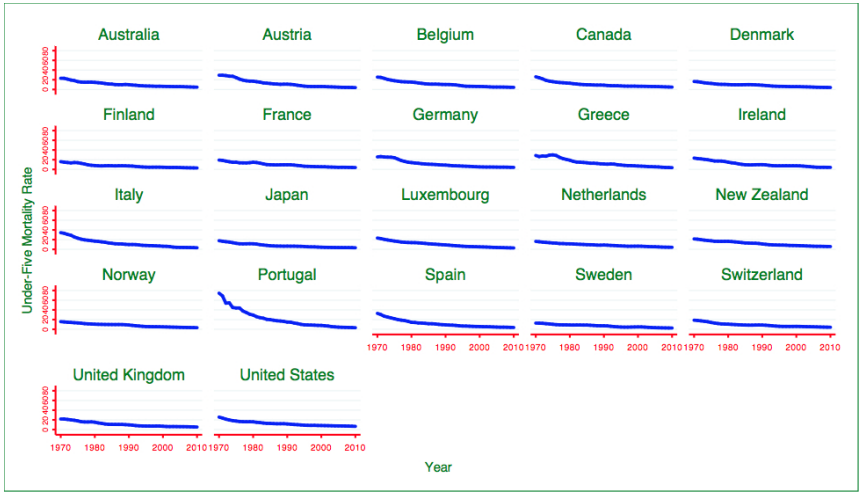


Figure 4: Under-Five Mortality Rates across OECD Countries (1970-2010)

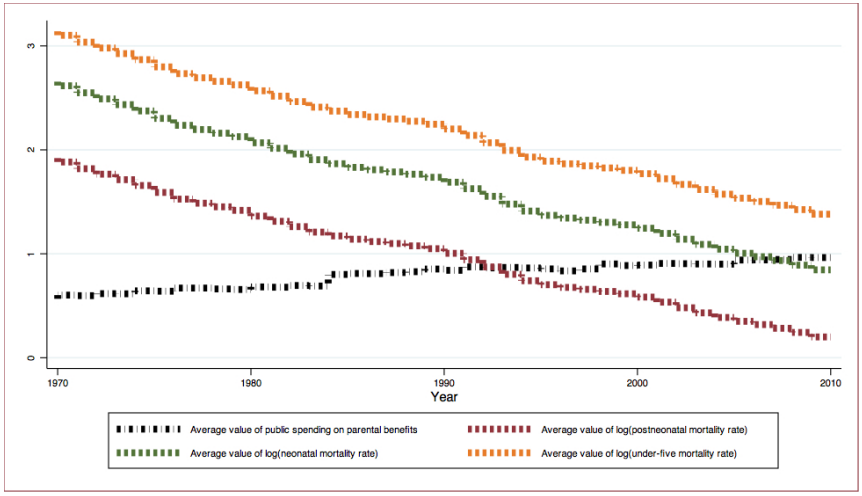


Figure 5: Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Child Health Outcomes

determinants of child mortality rates should be controlled to examine the

precise relationship. Seeing that descriptive statistics and diagrammatic demonstrations lead to do mixed presumptions on the relationship between parental leave benefits and child health outcomes, the following section, therefore, investigates issues econometrically.

2.5 Econometric Model and Methods of Analyses

The panel data model has the following semilogarithmic framework to analyze the relationship between parental leave benefits and child health outcomes[14];

$$lnc_{it} = \alpha L_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{2.15}$$

where the dependent variable lnc_{it} denotes the natural log of child mortality rates of country i in period t. The main independent variable of interest L_{it} is the public spending on parental leave benefits as a percentage of female wages in manufacturing. Due to the data unavailability in other units, in the econometric estimations parental leave benefits is used as a percentage of female wages in manufacturing. All other potential control variables are included in $\mathbf{x}_{it}$. Moreover, γ_i denotes a full set of country dummies and μ_t denotes a full set of year dummies. υ_{it} is an error term, capturing all other omitted factors, with $E(\upsilon_{it}) = 0$ for all i and t. Model is initially estimated using Pooled-OLS estimation method which excludes country dummies, γ_i. As it is well-known, strict exogeneity assumption is one of the crucial necessity for the unbiased and consistent estimates under OLS specification. Strict exogeneity assumes that idiosyncratic error term (υ_{it}) is uncorrelated with the individual specific effects. Since the pooled regression model neglects the heterogeneity

[14]In the balanced panel data setting twenty-two countries are observed yearly over a forty-year time period. This is the base sample which is used for the estimations that exclude control variables (For the detailed information see: Table (1) - Panel (A1)). All econometric estimations which include control variables have been done based on a sample that covers fifteen countries from 1975 to 2010 due to the data unavailability of some controls for some countries and years (For the detailed information see: Table (1) - Panel (A2)).

across individuals and assumes that all individuals have a unique effect, pooled-OLS estimator will be biased and inconsistent. But the fixed effect estimator will be consistent since it allows for the heterogeneity among individuals by assuming each one to have its own specific effect. As an alternative to pooled-OLS framework, I therefore used the fixed effect estimation technique to control for the country specific time invariant characteristics. Moreover, I also include country-specific time trends for the country-specific time-variant omitted factors.

To further take into account mean reverting dynamics (e.g the tendency of the mortality indicator to return to some equilibrium value for the country), the lagged dependent variable, $lnc_{i,t-1}$, is also added on the right hand side of the regression equation. Due to the unavailable data of parental leave benefits for developing countries, estimation samples mainly cover advanced economies where child mortality rates are really low compare to developing countries. It is mainly because of the advantage in medical technologies, facilities, high number of health personnel and the improved living standards. Therefore to control mean reverting dynamics which might occur as turning to some equilibrium value in mortality rates, estimations include lagged dependent variables. On the other hand the lagged value of the regressand is useful to further capture the past occurances in child mortality as well. It is important to note that the relationship between public spending on parental benefits and child mortality in a population may not be static and depend in part on the past level of child mortality.

$$lnc_{it} = \delta lnc_{it-1} + \alpha L_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{2.16}$$

However, In the context of dynamic estimation, the common fixed-effect estimator might be biased in a panel with short time dimension which is the often the case for macro-level studies (Nic81). On the other hand, time-invariant fixed effects characteristics may be correlated with the explanatory variables. To deal with these problems, instead of fixed effect technique in dynamic panel data setting, I use the generalized method of moments estimator (GMM) developed by Manuel Arellano

and Stephen R. Bond (1991)(AB91). It estimates the parameters of the system by specifying the model in first differences on both sides of the equation (2) which drops out the time invariant factors and country-specific unobservables.

Time series-cross sectional data (TCSE) are special cases of "panel data" where the number of units are less than number of time period in the sample. In TCSE setting, therefore, It is unlikely that cross-sectional panel errors will meet the assumption of sphericality. The estimations will be wrong if the errors show any of panel heteroskedasticity, contemporaneous correlation and serially correlated errors. To control for them, I additionally apply PCSE (panel corrected standard errors) technique following (BK95; BK96). However the PCSE method only corrects for the problems of contemporaneous correlation and panel heteroskedasticity. Following the convention in the literature, I focus on the autoregressive processes of order 1 (AR(1)) which indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Furthermore, in order to test for stationarity of the time series, I initially apply a battery of panel unit root tests on each econometric model. As a general model residuals of the each econometric model give mixed results. Therefore I have after applied the same unit root tests on each variable used in the respective models. Due to their statistical power, the panel unit root tests are more advantageous than their univariate counterparts even though the tests to a panel loose power in small samples. As is common in the macro literature, however, I carefully apply the battery of respective tests. First, I test whether the time series are cross-section independent. I apply (Fre95), (Fri37) and (Pes04)'s test statistics using STATA 12 (see (DHS06)). The test statistics show mixed findings on whether cross-section dependence does exist or not. Therefore, I apply both panel unit root tests that take into account cross-section dependence and Pesaran's. Moreover, I apply Pesarans second generation panel unit root test that does take into account cross-section dependence. Table 2 and Table 3 present the results of panel unit root tests on the relevant series of the natural log of neonatal mortality rate, the natural log of postneonatal mortality rate, the natural log of under-5 mortality

rate, public spending on parental leave benefits, natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates, female employment to population ratios and female educational attainment. I applied the Levin, Lin and Chu(LLJC02), Im-Pesaran-Shin(IPS03) and Fisher tests referring to (MW99) and (Cho01) tests. Since the stationary of variables are obtained after taking the first differences, all econometric specifications are reestimated using the first differences of the variables. Next section discusses the results in details.

Table 2: Results of the panel unit tests (H_0: Unit root in first difference)

	(1)	(2)	(3)
Variables			
Public Spending on Parental Leave Benefits			
	Stat	**Prob**	**Obs.**
Levin, Lin and Chu t*	-5.5164	0.0000	858
Im-Pesaran-Shin W-stat	-5.6472	0.0000	858
ADF-Fisher Chi-square	308.2776	0.0000	858
PP-Fisher Chi-square	652.7650	0.0000	858
Pesaran	-3.697	0.0000	858
The natural log of neonatal mortality rate			
Levin, Lin and Chu t*	-8.5015	0.0000	858
Im-Pesaran-Shin W-stat	-8.6102	0.0000	858
ADF-Fisher Chi-square	175.3960	0.0000	858
PP-Fisher Chi-square	211.5277	0.0000	858
Pesaran	-6.885	0.0000	858
The natural log of postneonatal mortality rate			
Levin, Lin and Chu t*	-8.3744	0.0000	858
Im-Pesaran-Shin W-stat	-8.4093	0.0000	858
ADF-Fisher Chi-square	173.4732	0.0000	858
PP-Fisher Chi-square	214.4262	0.0000	858
Pesaran	-6.869	0.0000	858
The natural log of under-five mortality rate			
Levin, Lin and Chu t*	-8.6438	0.0000	858
Im-Pesaran-Shin W-stat	-8.7250	0.0000	858
ADF-Fisher Chi-square	178.2262	0.0000	858
PP-Fisher Chi-square	209.7569	0.0000	858
Pesaran	-6.869	0.0000	858

Columns (1) of each sample show unit root test statistics with p-values represented in Columns (2). "Obs" stands for the number of observations in the sample. The sample that is used to obtain the test results is a balanced yearly panel data for 22 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States.) between 1970 and 2009. Levin, Lin and Chu t*, Im-Pesaran-Shin W-stat, ADF-Fisher Chi-square, PP-Fisher Chi-square stand for Levin-Lin-Chu unit-root test, Im-Pesaran-Shin unit-root test, Fisher-type unit-root test based on augmented Dickey-Fuller tests, Fisher-type unit-root test based on Phillips-Perron tests. The results of the tests were obtained including one lag of the variable and a deterministic trend. The inferences do not change at all when more lags are included.

Table 3: Results of the panel unit tests (H_0: Unit root in first difference)

	(1)	(2)	(3)
Variables			
Public Spending on Parental Leave Benefits			
	Stat	**Prob**	**Obs.**
Levin, Lin and Chu t*	-12.5793	0.0000	510
Im-Pesaran-Shin W-stat	-12.7024	0.0000	510
ADF-Fisher Chi-square	183.7354	0.0000	510
PP-Fisher Chi-square	314.0271	0.0000	510
Pesaran	-3.697	0.0000	510
The natural log of neonatal mortality rate			
Levin, Lin and Chu t*	-7.2293	0.0000	510
Im-Pesaran-Shin W-stat	-6.2492	0.0000	510
ADF-Fisher Chi-square	105.0487	0.0000	510
PP-Fisher Chi-square	94.5432	0.0000	510
Pesaran	-4.703	0.0000	510
The natural log of postneonatal mortality rate			
Levin, Lin and Chu t*	-7.0611	0.0000	510
Im-Pesaran-Shin W-stat	-6.1136	0.0000	510
ADF-Fisher Chi-square	104.0328	0.0000	510
PP-Fisher Chi-square	93.9381	0.0000	510
Pesaran	-4.831	0.0000	510
The natural log of under-five mortality rate			
Levin, Lin and Chu t*	-7.2745	0.0000	510
Im-Pesaran-Shin W-stat	-6.2392	0.0000	510
ADF-Fisher Chi-square	105.3462	0.0000	510
PP-Fisher Chi-square	93.6705	0.0000	510
Pesaran	-4.714	0.0000	510
Total health expenditures as a percentage of GDP			
Levin, Lin and Chu t*	-4.5784	0.0000	510
Im-Pesaran-Shin W-stat	-7.2299	0.0000	510
ADF-Fisher Chi-square	139.6671	0.0000	510
PP-Fisher Chi-square	169.1518	0.0000	510
Pesaran	-6.880	0.0000	510
Log(GDP per capita)			
Levin, Lin and Chu t*	-3.0518	0.0000	510
Im-Pesaran-Shin W-stat	-3.3624	0.0004	510
ADF-Fisher Chi-square	63.2640	0.0004	510
PP-Fisher Chi-square	104.5326	0.0000	510
Pesaran	-3.739	0.0000	510
The share of population with health insurance coverage			
Levin, Lin and Chu t*	-2.6096	0.0000	510
Im-Pesaran-Shin W-stat	-2.9194	0.0000	510
ADF-Fisher Chi-square	71.4241	0.0000	510
PP-Fisher Chi-square	174.8365	0.0000	510
Pesaran	- 6.345	0.0000	510
The female employment (aged between 15-64)/population ratio			
Levin, Lin and Chu t*	-5.8277	0.0000	510
Im-Pesaran-Shin W-stat	-5.9276	0.0000	510
ADF-Fisher Chi-square	101.9198	0.0000	510
PP-Fisher Chi-square	185.1633	0.0000	510
Pesaran	-4.090	0.0000	510
The fertility rate (children per women aged 15 to 49 years old)			
Levin, Lin and Chu t*	-6.1590	0.0000	510
Im-Pesaran-Shin W-stat	-9.0830	0.0000	510
ADF-Fisher Chi-square	168.0014	0.0000	510
PP-Fisher Chi-square	480.4985	0.0000	510
Pesaran	-8.067	0.0000	510
Female educational attainment aged between 15-44 years old			
Levin, Lin and Chu t*	-8.6717	0.0000	510
Im-Pesaran-Shin W-stat	-10.2613	0.0000	510
ADF-Fisher Chi-square	191.4414	0.0000	510
PP-Fisher Chi-square	437.0476	0.0000	510
Pesaran	-7.487	0.0000	510

Columns (1) of each sample show unit root test statistics with p-values represented in Columns (2). "Obs" stands for the number of observations in the sample. The sample that is used to obtain the test results is a balanced yearly panel data for 15 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Japan, the Netherlands, Norway, Portugal, Sweden, Switzerland, the United Kingdom) through the period from 1975 to 2009. Levin, Lin and Chu t*, Im-Pesaran-Shin W-stat, ADF-Fisher Chi-square, PP-Fisher Chi-square stand for Levin-Lin-Chu unit-root test, Im-Pesaran-Shin unit-root test, Fisher-type unit-root test based on augmented Dickey-Fuller tests, Fisher-type unit-root test based on Phillips-Perron tests. The results of the tests were obtained including one lag of the variable and a deterministic trend. The inferences do not change at all when more lags are included.

2.6 Results

2.6.1 Preliminary Results: Relationship Between Public Spending on Parental Benefits and Child Mortality Rates

Figure 6: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Neonatal Mortality Rates

Figures (6-8) graphically show the simple scatter plots between public spending on parental leave benefits (% of female wages in the manufacturing sector) and the log of child mortality outcomes in a sample of 22 OECD countries from 1970 to 2010. The vertical axis of each figure represents the natural log of mortality rates for neonatal, postneonatal and under-five deaths respectively. Public spending on parental leave benefits (as a % of female wages in the manufacturing sector) is shown along the horizontal axis. The figures reveal an ambigious negative association between public spending on parental leave benefits and child mortality rates.Alternatively, Figures (9-11) demonstrate the relevant assocation in average terms. Values for variables are averaged by country from 1970 to 2010. Evidence in the figures shows almost a lack of relationship since semilogarithmic regression lines are nearly flat.

I further investigate these benchmark results econometrically. Table 4 presents the relevant estimates for the all child mortality outcomes.

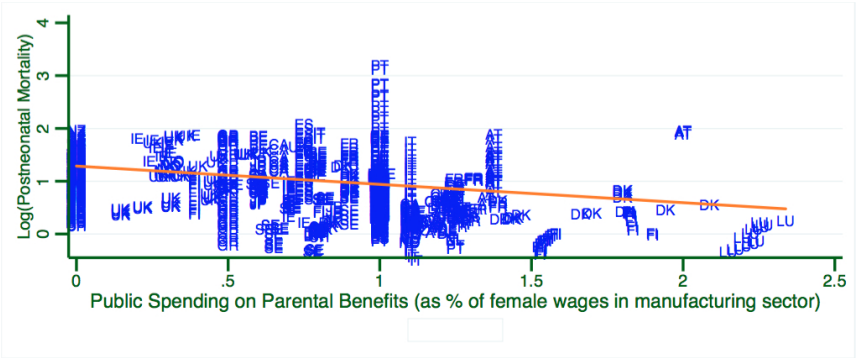


Figure 7: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Postneonatal Mortality Rates

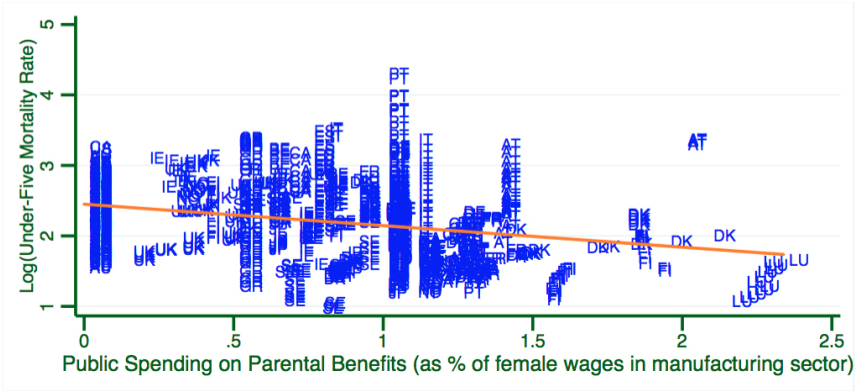


Figure 8: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Under-Five Mortality Rates

The estimation results on the relationship between public spending on parental leave benefits (PLB) and neonatal mortality rates are shown in Panel(A) without including any control variable. The econometric frameworks at Panel(B) and Panel(C) replicate the same estimations to investigate the relevant relationship for postneonatal mortality rates. Columns (1) of each panel show the pooled OLS estimation results. The coefficient estimates of public spending on PLB is negatively significant for all

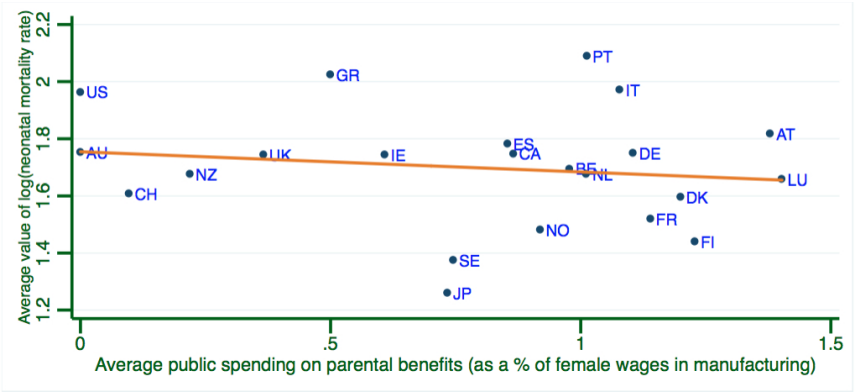


Figure 9: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Neonatal Mortality Rates

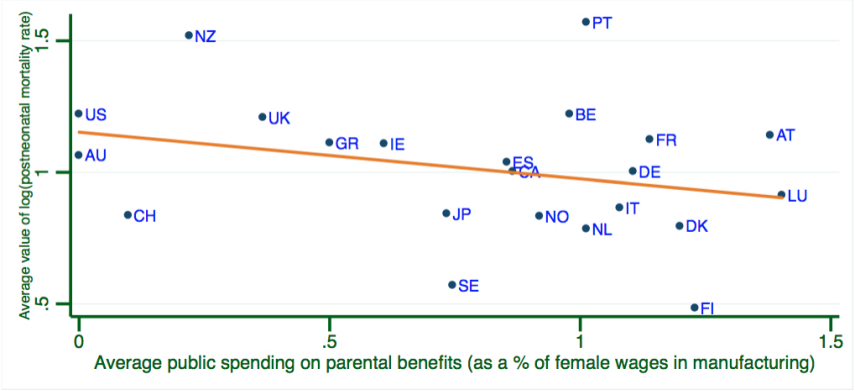


Figure 10: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Postneonatal Mortality Rates

mortality rates. However, the pooled-OLS estimation technique looks at the cross-sectional association rather than at the *within variation*. Hence, country specific omitted factors and potential long-run determinants can be reasons of making incorrect inferences. Thus, to control for country specific characteristics and potential long-run determinants of both parental leave benefits and child mortality rates, the following columns of

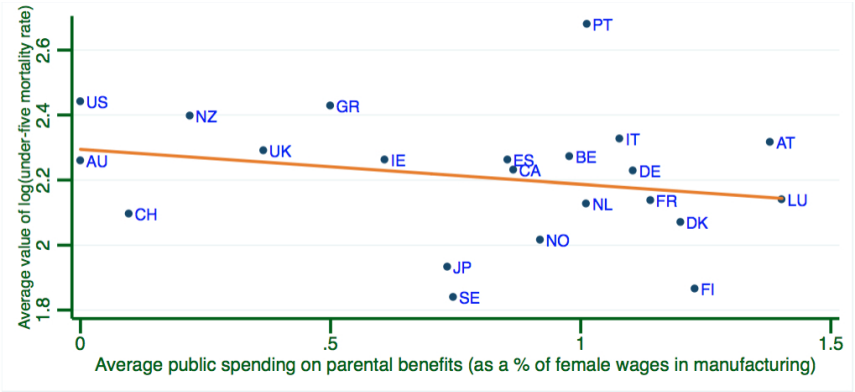


Figure 11: Relationship Between Public Spending on Parental Benefits (as a % of female wages in manufacturing) and Under-Five Mortality Rates

each panel add country fixed effects. Namely, Columns (2) simply replicate the pooled OLS estimations in Columns(1) by additionally including only country fixed effects. The negative cross-sectional relationship between public spending on PLB and mortality rates disappeares when the country fixed effects are included. Columns (2) of each panel include also country specific times trends to capture the impact of time-variant characteristics (e.g medical technology). The first econometric model itself, which is represented with equation (1), is static and does not include lagged dependent variable. Using the second specification which includes the lagged dependent variable Arellano Bond GMM method used as an additional framework to Pooled-OLS and FE estimations. Relevant results are represented in Columns(3) and the estimation results are robust to FE estimates[15].

[15]In accordance with the large sample properties of the Arellano-Bond GMM method, GMM estimator might be severely biased and imprecise in panel data with a small number of cross-sectional units. I therefore replicate the results with Brunos (2005a, 2005b) bias corrected least squares dummy variable estimator as well. Using (AH82), (BB00) or (AB91) as the initial estimators, the results remain unchanged. Bootstrapping standard errors are common practices in the application of bias corrected least squares dummy variable estimator.Following (BCMM07), I initially undertake 50 repetitions of the procedure to bootstrap the estimated standard errors. The coefficient estimate of public spending on parental benefits is always insignificant even with more repetitions such as 100, 200 or 500.

Table 4: Relationship Between Parental Leave Benefits and Child Health Outcomes

	PANEL A			PANEL B			PANEL C		
	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Public Spending on PLB	-0.0390**	0.0131	0.0054	-0.1160***	0.0087	0.0059	-0.0663***	0.0114	0.0064
	(0.0152)	(0.0300)	(0.0056)	(0.0202)	(0.0284)	(0.0049)	(0.0153)	(0.0295)	(0.0052)
Lag(Log Neonatal M.)			0.8579***						
			(0.0161)						
Lag(Log Postneonatal M.)						0.8509***			
						(0.0226)			
Lag(Log Under-Five M.)									0.8575***
									(0.0181)
R-Square	0.8173	0.9839		0.7335	0.9847		0.8195	0.9841	
Number of Cases	880	880	814	880	880	814	880	880	814
	PANEL D			PANEL E			PANEL F		
	FE	AB	PCSE	FE	AB	PCSE	FE	AB	PCSE
Public Spending on PLB	0.0361	0.0128	0.0019	0.0328	0.0106	0.0023	0.0354	0.0126	0.0024
	(0.0285)	(0.0140)	(0.0101)	(0.0253)	(0.0129)	(0.0089)	(0.0271)	(0.0135)	(0.0096)
Lag(Log Neonatal M.)		0.8401***	0.7722***						
		(0.0181)	(0.0363)						
Lag(Log Postneonatal M.)					0.8427***	0.7593***			
					(0.0174)	(0.0359)			
Lag(Log Under-Five M.)								0.8418***	0.7682***
								(0.0179)	(0.0359)
Health Care Coverage	-0.0010	-0.0007	-0.0006	-0.0013	-0.0006	-0.0007	-0.0011	-0.0007	-0.0007
	(0.0010)	(0.0004)	(0.0005)	(0.0009)	(0.0005)	(0.0005)	(0.0009)	(0.0005)	(0.0005)
Total health expenditures	-0.0228	-0.0041	-0.0044	-0.0210	-0.0045	-0.0043	-0.0220	-0.0042	-0.0044
	(0.0132)	(0.0039)	(0.0040)	(0.0130)	(0.0038)	(0.0039)	(0.0130)	(0.0037)	(0.0039)
Log(GDP)	-0.0573	-0.0798**	-0.0191	-0.0146	-0.0646*	-0.0219	-0.0359	-0.0722**	-0.0196
	(0.2263)	(0.0347)	(0.0517)	(0.2117)	(0.0378)	(0.0493)	(0.2167)	(0.0341)	(0.0500)
Female Employment Rate	1.0805*	0.1672*	0.2337**	0.9147*	0.1471	0.2069**	1.0146*	0.1654*	0.2215**
	(0.5641)	(0.1006)	(0.0965)	(0.5015)	(0.0896)	(0.0887)	(0.5318)	(0.0951)	(0.0922)
Fertility Rate	0.0171	0.0655***	0.0207	0.0106	0.0510***	0.0105	0.0138	0.0598***	0.0166
	(0.0355)	(0.0212)	(0.0178)	(0.0343)	(0.0183)	(0.0172)	(0.0345)	(0.0198)	(0.0172)
R-Square	0.9812		0.9942	0.9827		0.9943	0.9817		0.9950
Number of Cases	525	480	525	525	480	525	525	480	525

Panel A, Panel B and Panel C represent results on the relationship between public spending on parental benefits and child mortality rates without controlling any covariates. In Panel A the dependent variable is logarithm of neonatal mortality rate. Panel B and Panel C use the logarithm of postneonatal and under-five mortality rates as dependent variables. Pooled cross-sectional OLS estimation results are represented in columns 1 of each panel. Fixed effects OLS estimates are shown in columns 2 with country dummies. Columns 3 uses GMM of Manuel Arellano and Stephen R. Bond (1991) which is instrumented for the log of child mortality rates using a double lag. Estimations are done based on a sample which is a yearly balanced panel which covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2009 where public spending on parental leave as a percent of female wages in manufacturing is the main regressor. Panel D, Panel E and Panel F investigate the relationship between public spending on parental benefits and child mortality rates with additional covariates such as natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. The first columns of each panel replicate fixed effect estimations with additional control variables. Columns 2 show Arellano-Bond GMM estimation results. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns 3 which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Estimations which include control variables use a sample covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2009. All regressions at all panels include year dummies. Except Pooled OLS specifications, they all include country dummies and country specific time trends as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB is the abbreviation for Parental Leave Benefits.

The specifications in Panel (E-F) in Table 4 analyze the relationship between public spending on parental benefits and child mortality rates with including additional sets of controls such as the natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios.[16].The first columns of Panel E-F are the fixed effect estimations with set of controls. Columns 3 show coefficient estimates of GMM framework. Furthermore, to control for contemporaneous correlation and panel heteroskedasticity, I estimate Panel-corrected standard errors (PCSE) in Columns (4). I focus on autoregressive processes of order 1 (AR(1)) indicating on the existence of a serial correlation and allowing Prais-Winsten regression for the correction of serial correlation[17]. It is important to note that all standard errors are fully robust against arbitrary heteroskedasticity as well. The inclusion of the basic control variables has a noticeable effect on the size of the parental leave coefficient estimates but none of the coefficients is still significant at any conventional level. Namely, previous results are robust to using additional covariates as well.

The absence of a significant relationship between public spending on parental leave benefits and child mortality indicators is also not driven by large standard errors. This basic finding is also robust to using the first differences of the variables for the stationary concern. Table(5) represent the results using the first differences of the variables which are simply the replication of same estimation techniques in Table (4). Results remain unchanged.

[16]However, both fertility rate and female employment rate may be endogenous. Reverse causality might occure since parental leave benefits, not only for the child health but also are often provided with the goal of improving the labor market opportunities of women as well. Similarly higher infant mortality rates imply, ceteris paribus, that more births are needed to achieve a target family size with increasing fertility rate (Ruh00b). Reflecting these concerns, I have replicated results without controlling for those two covariates as well. Although the relevant estimates were not represented here, excluding these variables does not change the main results.

[17]The Wooldridge test I applied implies the existence of arbitrary serial correlation, null hyphothesis of no serial correlation is strongly rejected (Woo02). As an alternative to Prais-Winsten regression estimation, clustering standard errors at the country level fot the serial correlation problem does not change the results.

Turning to control variables, female employment ratio is positively significant in all regressions irrespective of which econometric framework is used and which mortality indicator is the main outcome of interest. The positive coefficient of female employment rate may indicate that working mothers have less time to invest in childrearing and childbearing activities. The coefficient estimates of fertility rates and log of per capita GDP have expected signs and significant with the use of GMM technique (Columns (2) of Panels(D-F) in Table 4).

Table 5: Relationship Between Parental Leave Benefits and Child Health Outcomes

	PANEL A			PANEL B			PANEL C		
	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ΔPublic Spending on PLB	-0.0037	-0.0040	0.0040	-0.0044	-0.0052	0.0011	-0.0042	-0.0046	-0.0056
	(0.0099)	(0.0091)	(0.0052)	(0.0096)	(0.0084)	(0.0045)	(0.0097)	(0.0088)	(0.0054)
ΔLag(Log Neonatal M.)			0.3755***						
			(0.0815)						
ΔLag(Log Postneonatal M.)						0.3264***			
						(0.1051)			
ΔLag(Log Under-Five M.)									0.3441***
									(0.0893)
R-Square	0.1771	0.2236		0.1629	0.2139		0.1756	0.2230	
Number of Cases	858	858	792	858	858	792	858	858	792
	PANEL D			PANEL E			PANEL F		
	FE	AB	PCSE	FE	AB	PCSE	FE	AB	PCSE
ΔPublic Spending on PLB	0.0155	0.0006	0.0047	0.0134	0.0035	0.0056	0.0148	0.0019	0.0050
	(0.0119)	(0.0083)	(0.0109)	(0.0104)	(0.0064)	(0.0098)	(0.0111)	(0.0072)	(0.0103)
ΔHealth Care Coverage	-0.0001	0.0004	0.0003	-0.0003	0.0003	0.0002	-0.0002	0.0004	0.0003
	(0.0005)	(0.0003)	(0.0006)	(0.0005)	(0.0004)	(0.0007)	(0.0005)	(0.0003)	(0.0006)
ΔTotal health expenditures	0.0026	0.0024	0.0028	0.0029	0.0027	0.0034	0.0026	0.0022	0.0028
	(0.0060)	(0.0061)	(0.0050)	(0.0052)	(0.0058)	(0.0051)	(0.0056)	(0.0060)	(0.0050)
ΔLog(GDP)	-0.2239**	-0.2274***	-0.2009**	-0.2275**	-0.2236***	-0.1985**	-0.2250**	-0.2267***	-0.2012***
	(0.0816)	(0.0608)	(0.0785)	(0.0856)	(0.0571)	(0.0788)	(0.0829)	(0.0562)	(0.0772)
ΔFemale Employment Rate	0.2059	0.0893	0.1167	0.1786	0.0798	0.1222	0.1939	0.0787	0.1128
	(0.1494)	(0.0981)	(0.1224)	(0.1392)	(0.0981)	(0.1216)	(0.1407)	(0.0904)	(0.1198)
ΔFertility Rate	0.0818**	0.0593**	0.0666***	0.0893**	0.0672**	0.0769***	0.0836**	0.0611**	0.0694***
	(0.0319)	(0.0271)	(0.0215)	(0.0324)	(0.0266)	(0.0202)	(0.0320)	(0.0269)	(0.0206)
ΔLag(Log Neonatal M.)		0.4836***	0.3490***						
		(0.0537)	(0.0544)						
ΔLag(Log Postneonatal M.)					0.4482***	0.2904***			
					(0.0633)	(0.0556)			
ΔLag(Log Under-Five M.)								0.4767***	0.3321***
								(0.0583)	(0.0541)
R-Square	0.3491		0.4594	0.3645		0.4675	0.3584		0.4617
Number of Cases	510	465	510	510	465	510	510	465	510

This table replicates the same estimation techniques of Table 4 by first differentiating all variables against non-stationary. Panel A, Panel B and Panel C represent results on the relationship between public spending on parental benefits and child mortality rates without controlling any covariates. In Panel A, the dependent variable is the logarithm of neonatal mortality rate. Panel B and Panel C use the logarithm of postneonatal and under-five mortality rates as dependent variables. Pooled cross-sectional OLS estimation results are represented in columns 1 of each panel. Fixed effects OLS estimates are shown in columns 2 with country dummies. Columns 3 uses GMM of Manuel Arellano and Stephen R. Bond (1991) which is instrumented for the log of child mortality rates using a double lag. Estimations are done based on a sample which is a yearly balanced panel which covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2009 where public spending on parental leave as a percent of female wages in manufacturing is the main regressor. Panel D, Panel E and Panel F investigate the relationship between public spending on parental benefits and child mortality rates with additional covariates such as natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. The first columns of each panel replicate fixed effect estimations with additional control variables. Columns 2 show Arellano-Bond GMM estimation results. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns 3 which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Estimations which include control variables use a sample covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2009. All regressions at all panels include year dummies. Except Pooled OLS specifications, they all include country dummies and country specific time trends as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB is the abbreviation for Parental Leave Benefits.

The preliminary finding of the paper on no evidence for a significant relationship between public spending on parental leave benefits and child mortality rates has not changed with the analysis which take into account the first differences of the variables[18]. Overall, my results in Table 5 support two basic hypotheses: (1) GDP per capita is positively related with the low level of child mortality; and (2) the relationship between fertility rate and child mortality is positive. Moreover, overall results poses two important questions:

(1) Is there a long-run causal relationship between public spending on parental leave benefits and child mortality rates? It is important to emphasize that this paper does not directly address the causation. A complication might arise in assessing the direction of the causality. The measurement for parental leave benefits may be endogenous and the causality might run from existing child mortality rates to the generosity of the welfare state in parental leave benefits. That is, the welfare state may expand parental policies to compensate for an increase in child mortality rates and provide more services within families. To allow for a causal interpretation of the estimation results, an instrumental variable (IV) strategy should be identified. For an IV strategy, the related literature on the efficiency of public policies on development outcomes mainly used ”legal origins” as an exogeneous instrument which refers to the legal system that countries belong into such as common law, German civil law, Scandinavian civil law, French civil law etc. However, legal origins themselves may affect the related outcomes through channels other than parental leave benefits.(AJ05) also point out few shortcomings in the use of this instruments which violates exclusion restrictions. Considering the existing literature which suggests that Scandinavian origin

[18]In addition to the investigation of parental leave benefits and child health outcomes, I examine this relationship between maternity leave benefits and child outcomes as well. As it is explained in the section (2.2), “parental leave benefits” is a generic term which captures the total amount of payments that are provided from all types of leave schemes which parents are entitled to receive. These are maternity leave entitlements, parental leave entitlements and child care leave entitlements. Among those entitlements, the most traditional one is the maternity leave entitlements which provide benefits only to mothers. To examine whether maternity leave benefits alone are relevant for the child health outcomes, I have solely analyzed the relationship between maternity leave benefits and child mortality rates as well.The relevant results are represented in Appendix-C.

countries are sharply more interventionist similar to that socialist countries, they may have a greater interest in state expansion with social welfare policies than common law countries. On the other hand, it can be expected that civil law countries, in part because of their commitment to equality, might redistribute more on health to reduce infant mortality among poors(LPLdSSV99).(Sen98) also strongly argues that infant mortality statistics are important indicators in the formulation of economic policy decisions over a large field covering distributional concerns over the class, gender and race. Therefore, using legal origins as IV estimators can be severelly biased and imprecise in this setting. Thus, this paper avoids making causal claims on the efficiency of parental leave policies on child health outcomes. The next section further interprets the relevant results. (2) What would be the other omitted factors influencing child health outcomes? To test the validity of my results, I subject each of these key regressions to one robustness test and the results are reported in Table 6. Female educational attainment aged between 15-44, which is the proxy for the maternal education, is considered as an additional covariate for the robustness check.

2.6.2 Robustness Check: Female Educational Attainment

According to the World Economic Forum's "The Global Gender Gap Report"(2012), the lower but persistent gender gap in educational attainment exists for most of the countries in the world. However, OECD countries have almost a gender equal pattern in educational attainment. The ratio of female to male educational attainment increased from around 57.7% in 1950 to 80.3% in 1990 and to 85.9% in 2010. Previous studies suggest that promoting female attainment to education positively contributes to children's physical and developmental well-being. Recent studies have emphasized that higher educated women tend to have smaller families, because of the increased employment opportunities and better knowledge about contraception. Namely, less children in a family improves the chances of child survival. More education also might help women to make better decisions about several health factors such as basic hy-

giene, nutrition and immunization. One of the important theories that lies behind these conclusions is the "Social Modernization Theory" (Lip59) which has emphasized that maternal education may reduce child mortality rates. The relationship between maternal education and child mortality has been previously confirmed in many single-country studies. However, due to the unavailability of yearly data, cross-country research on parental leave policies(Ruh00b; Tan05) have thus far not considered it, as an important determinant of child health. Using a new dataset ("Educational Attainment and Child Mortality Estimates by Country (1970-2009") which is published in 2010 by the Institute for Health Metrics and Evaluation (IHME) of Washington University, this will be the first study that investigates the role of maternal education in the cross-country parental leave and child health literature. Maternal education is proxied with female educational attainment aged between 15-44.

Table 6 represent the results of robustness check estimations with female educational attainment. Relevant results for neonatal, postneonatal and under-five mortality rates are shown in Panel A-C respectively using the original variables. Panel D-F represent the robustness check results using the first differentiation of the variables.

Table 6: Robustness Check: Relationship Between Parental Leave Benefits and Child Health Outcomes

	PANEL A			PANEL B			PANEL C		
	FE	AB	PCSE	FE	AB	PCSE	FE	AB	PCSE
Public Spending on PLB	0.0456	0.0159	0.0036	0.0431	0.0128	0.0040	0.0451	0.0154	0.0040
	(0.0299)	(0.0144)	(0.0100)	(0.0269)	(0.0132)	(0.0088)	(0.0286)	(0.0138)	(0.0094)
Female Education	-0.0097*	-0.0023**	-0.0018	-0.0104*	-0.0018**	-0.0018	-0.0098*	-0.0020**	-0.0017
	(0.0054)	(0.0009)	(0.0013)	(0.0056)	(0.0009)	(0.0012)	(0.0054)	(0.0009)	(0.0012)
Lag(Log Neonatal M.)		0.8301***	0.7672***						
		(0.0171)	(0.0364)						
Lag(Log Postneonatal M.)					0.8330***	0.7523***			
					(0.0168)	(0.0361)			
Lag(Log Under-Five M.)								0.8321***	0.7627***
								(0.0169)	(0.0361)
Health Care Coverage	-0.0006	-0.0006	-0.0006	-0.0009	-0.0006	-0.0006	-0.0007	-0.0006	-0.0006
	(0.0010)	(0.0004)	(0.0005)	(0.0010)	(0.0005)	(0.0005)	(0.0010)	(0.0004)	(0.0005)
Total health expenditures	-0.0219	-0.0039	-0.0043	-0.0200	-0.0043	-0.0042	-0.0211	-0.0042	-0.0043
	(0.0145)	(0.0039)	(0.0040)	(0.0143)	(0.0039)	(0.0039)	(0.0143)	(0.0038)	(0.0039)
Log(GDP)	-0.0860	-0.0759**	-0.0149	-0.0162	-0.0621*	-0.0182	-0.0651	-0.0692**	-0.0157
	(0.2163)	(0.0321)	(0.0511)	(0.1994)	(0.0357)	(0.0488)	(0.2061)	(0.0319)	(0.0494)
Female Employment Rate	1.1661*	0.1880**	0.2514***	1.0063*	0.1660*	0.2253**	1.1012*	0.1832**	0.2388***
	(0.5739)	(0.0925)	(0.0964)	(0.5094)	(0.0862)	(0.0890)	(0.5408)	(0.0880)	(0.0924)
Fertility Rate	0.0065	0.0591***	0.0171	0.0146	0.0456**	0.0067	0.0101	0.0541***	0.0130
	(0.0442)	(0.0200)	(0.0181)	(0.0442)	(0.0184)	(0.0176)	(0.0435)	(0.0191)	(0.0176)
R-Square	0.9820		0.9943	0.9837		0.9943	0.9825		0.9951
Number of Cases	525	480	525	525	480	525	525	480	525
	PANEL D			PANEL E			PANEL F		
	FE	AB	PCSE	FE	AB	PCSE	FE	AB	PCSE
ΔPublic Spending on PLB	0.0158	-0.0001	0.0048	0.0138	0.0028	0.0058	0.0151	0.0013	0.0051
	(0.0118)	(0.0082)	(0.0109)	(0.0102)	(0.0063)	(0.0098)	(0.0110)	(0.0072)	(0.0103)
ΔFemale Education	-0.0008	-0.0004	-0.0003	-0.0011	-0.0003	-0.0004	-0.0008	-0.0003	-0.0002
	(0.0013)	(0.0009)	(0.0015)	(0.0011)	(0.0008)	(0.0014)	(0.0012)	(0.0008)	(0.0015)
ΔLag(Log Neonatal M.)		0.4831***	0.3498***						
		(0.0537)	(0.0544)						
ΔLag(Log Postneonatal M.)					0.4478***	0.2910***			
					(0.0630)	(0.0557)			
ΔLag(Log Under-Five M.)								0.4765***	0.3329***
								(0.0581)	(0.0541)
ΔHealth Care Coverage	-0.0001	0.0004	0.0003	-0.0002	0.0003	0.0002	-0.0001	0.0004	0.0003
	(0.0005)	(0.0003)	(0.0006)	(0.0005)	(0.0003)	(0.0007)	(0.0005)	(0.0003)	(0.0006)
ΔTotal health expenditures	0.0028	0.0024	0.0028	0.0031	0.0027	0.0035	0.0028	0.0022	0.0029
	(0.0060)	(0.0060)	(0.0050)	(0.0052)	(0.0058)	(0.0051)	(0.0056)	(0.0060)	(0.0050)
ΔLog(GDP)	-0.2240**	-0.2269***	-0.2010**	-0.2276**	-0.2239***	-0.1987**	-0.2251**	-0.2267***	-0.2014***
	(0.0822)	(0.0606)	(0.0785)	(0.0861)	(0.0568)	(0.0788)	(0.0834)	(0.0561)	(0.0772)
ΔFemale Employment Rate	0.2075	0.0926	0.1173	0.1807	0.0804	0.1230	0.1954	0.0800	0.1133
	(0.1485)	(0.0975)	(0.1224)	(0.1387)	(0.0981)	(0.1216)	(0.1399)	(0.0901)	(0.1198)
ΔFertility Rate	0.0829**	0.0603**	0.0670***	0.0907**	0.0678***	0.0773***	0.0846**	0.0617**	0.0697***
	(0.0315)	(0.0262)	(0.0216)	(0.0319)	(0.0260)	(0.0203)	(0.0316)	(0.0263)	(0.0207)
R-Square	0.3495		0.4601	0.3652		0.4682	0.3588		0.4623
Number of Cases	510	465	510	510	465	510	510	465	510

This table replicates the same estimation techniques of Table 4 by first differentiating all variables against non-stationary. Panel A, Panel B and Panel C represent results on the relationship between public spending on parental benefits and child mortality rates without controlling any covariates. In Panel A, the dependent variable is the logarithm of neonatal mortality rate. Panel B and Panel C use the logarithm of postneonatal and under-five mortality rates as dependent variables. Pooled cross-sectional OLS estimation results are represented in columns 1 of each panel. Fixed effects OLS estimates are shown in columns 2 with country dummies. Columns 3 uses GMM of Manuel Arellano and Stephen R. Bond (1991) which is instrumented for the log of child mortality rates using a double lag. Estimations are done based on a sample which is a yearly balanced panel which covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2009 where public spending on parental leave as a percent of female wages in manufacturing is the main regressor. Panel D, Panel E and Panel F investigate the relationship between public spending on parental benefits and child mortality rates with additional covariates such as natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. The first columns of each panel replicate fixed effect estimations with additional control variables. Columns 2 show Arellano-Bond GMM estimation results. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns 3 which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Estimations which include control variables use a sample covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2009. All regressions at all panels include year dummies. Except Pooled OLS specifications, they all include country dummies and country specific time trends as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB is the abbreviation for Parental Leave Benefits.

The econometric frameworks in Panels A-C of Tables 6 control female educational attainment with other controls to investigate the relationship between public spending on PLB and child health outcomes. The main dependent variable of interest in Panel A, Panel B and Panel C are the natural log of neonatal mortality, postneonatal mortality and under-five mortality rates respectively. Panel D-F replicate same estimations using the first differences of all variables to take into account the stationary issue. Columns (1) of each panel show the fixed effect estimation results. The coefficient of parental leave benefits is insignificant with fixed effect estimation technique. Arellano Bond estimates in columns (2) also support the insignificance of the parental leave benefits in decreasing the child mortality rates. The last column of each panel represents the Prais-Winsten regression estimates. Results remain unchanged on the insignificancy of parental leave benefits. On the contrary, the coefficient of female educational attainment itself is expectedly negative with FE and GMM specifications for all mortality rates. However, it has turned to be insignificant with PCSE (AR(1)) estimation which controls potential serial and contemporaneous correlation. Moreover estimations using the first differences of the variables do not support this previous finding as well. Positive coefficients of fertility rates and negative coefficients of GDP per capita is robust to estimations with different techniques similarly to the previous findings shown in Table 5. To sum up, using female educational attainment, which is the proxy for maternal education, the robustness check estimations show that female educational attainment also do not affect the lack of a relationship between public spending on parental leave benefits and child health outcomes.

Chapter 3

Female Political Representation, Political Responsiveness and Child Health Outcomes

3.1 Introduction

As discussed in the previous chapter, (RS82) established a theoretical model which shows that some economic factors such as health related goods and services play an important role for the determination of the child health. There is sufficient amount of research on the economic determinants of child health and most of them mainly focused on the role of public health expenditures. The contradicting findings among alternate studies have endorsed the fact that public health expenditures often does not produce expected improvements in child health outcomes. Therefore Chapter 2 has provided an evidence for this strand of literature that likewise the public expenditures on health, public spending on parental benefits may also be irrelevant on the child health outcomes[1].

[1]Public spending on parental leave benefits are social welfare payments for the use of parents during the pregnancy period. Although, both public health expenditures and the

The previous literature explains the reasons why public health expenditures are not always efficient in reducing child mortality in the following two ways:

- a) The crowding out effect of private sector allocation.
- b) The inefficiency of governance in public reseource allocation (e.g corruption)

The nature of public health expenditures allows both for the crowding out effect of private sector allocation and the inefficiency of governance (or political institutions) in health-service delivery. In contrast to public health expenditures, public spending on parental leave benefits are distributed solely by the government. There is, therefore, no channel for the private provision of parental leave benefits. Namely, the presence of the private sector's crowding out effect on parental leave benefits is an impossible case for explaining the insignificant relationship between public spending on parental leave benefits and child health outcomes. The existing studies on the relationship between the inefficiency of governance in resource allocation and child health outcomes has mainly focused on the bribes that corrupt politicians might levy on the high technology medical equipment, or advanced hospital facilities since they are produced by a limited number of suppliers.(Mau98) argues that large bribes will be available on items on which the degree of competition is low. On the contrary, he has emphasized that welfare transfers (e.g old-age pensions, parental leave benefits, individual transfers such as the salaries of doctors) are policies where corrupt politicians may find limited or almost no room. On the other hand, most of the OECD countries, especially advanced economies, already have well-functioning anti-corruption measures and transparent legal frameworks to ensure bureaucratic quality. Thus, it is difficult to explain the insignificant relationship between parental leave benefits and child health outcomes through corruption, bribes etc.

spending on parental benefits are the policies which implemented in part for the well-being of children, they are different category of social welfare policies. Public health expenditures cover all governmental spending related to any kind of health facilities and do not capture parental leave benefits

What would be the reason for the insignificant relationship between parental leave benefits on child health outcomes over 40 years across OECD countries? Although, the private sector crowding out effect does not explain the insignificance of parental leave benefits on child health outcomes, the reason behind it might be an insufficient allocation due to the crowding out effect of traditional social polices (e.g old-age benefits) on new policies such as parental benefits. Most of the social spending goes to the elderly population over forty years across countries. Although the recent economic crisis (2007/08) has made an increase on family-specific spending (includes parental leave benefits) with an idea to support future generations, social spending on the elderly amounted to 11% of GDP which is exactly half of the overall social welfare spending (22% of GDP) in 2009. 7% of the total is the share of public health expenditures and the remaining 4% of total social spending is shared by unemployment, housing, spending on active labor market programmes and spending on families.

Even though the inefficiency of governance in resorce allocation through corruption is almost impossible for the case of parental leave benefits, the inefficacy of governance should not be examined only from an economic perspective. The inefficiency in resource allocation through corruption is mostly related to uselessness of financial resources in a good way . Inefficacy in political institutions or governance might be analyzed from a political perspective as well. As (Ace06) argues since "democracy is a regime more beneficial to the majority of the populace, it will result in policies that are relatively more favorable to the majority". However he also mentions that democracy does not always correspond to some ideal of political equality. At this point, we can look at the role of the representative democracy for the possible political equality in governance of public resources. A body of theoretical literature argue that different groups by gender, race and ethnicity should be represented by members of those groups for better political institutions(Gui94; Lij12). In other words, public policy making should have more voices in itself because policies which made by*even electorally accountable governments* often fail to reflect the interests of some groups(Pan03). For instance, over the last

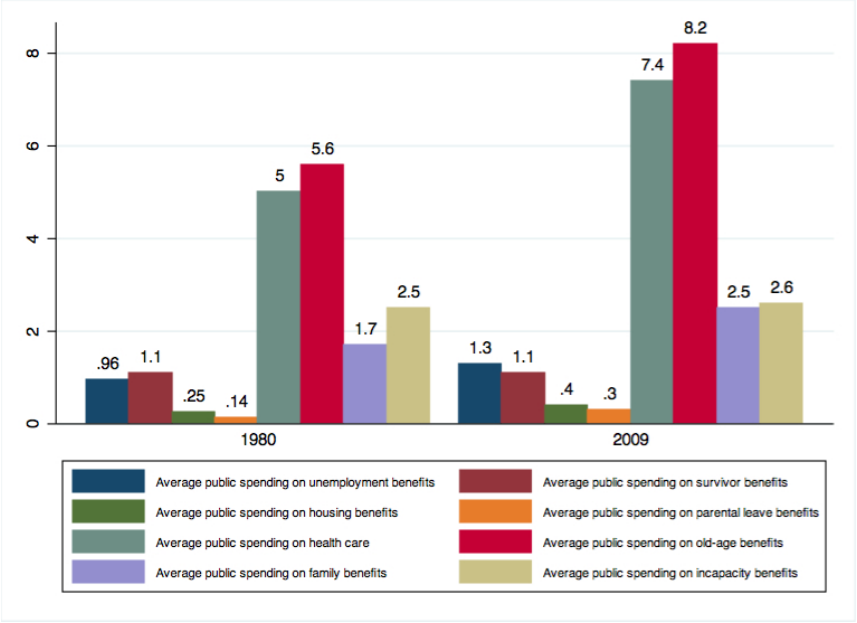


Figure 12: Relationship between public spending on parental benefits (as a % of female wages in manufacturing) and infant mortality outcomes

ten years, scholars have engaged in theoretical and empirical discussions on female representation in politics and ask whether there is a link between an increasing number of female politicians and allocation of public reseources to women's policy preferences which especially concern childcare and child raising(Phi95; You02). Public spending on parental leave benefits are allocated to support families, especially to mothers, for their efforts to care for newborns or young children. Moreover, considering their role on female labour market outcomes, parental leave policies are the preliminary social welfare policies which certainly reflects women's interests.

On the other hand Citizen Candidate Model of Besley and Coate (1997) assumes that identity or preferences of politician may matter for different policy outcomes. Following Citizen Candidate Models, there is sufficient amount of research which has emphasized the effect of fe-

male politicians on family-focused policy outcomes which directly target women and children[2]. To sum up, the role of women's representation in a representative body and the individual preferences of female politicians are both emphasized as important factors in policy-decision making which might reflect women's preferences and interests (e.g child health, maternal health).[3].

Public expenditures on parental leave benefits in OECD countries directly target young women and children. Parental leave benefits are allocated to support families (especially mothers before and after the childbirth) for their efforts to care for infants or young children. Moreover, if we also consider their role on female labour market outcomes, parental leave policies are the preliminary social welfare policies which certainly reflects women's interests.

Despite constituting half of the world's population, in most countries the number of women are proportionally less in positions of power and decision-making and they are still underrepresented in the representative bodies (e.g national parliaments) of even most advanced nations. By 2013, gender inequality in political participation across OECD countries is still persisted and there is currently no country which has reached the ideal of equal participation amongst women and men in politics. Sweden is the only country among OECD countries where male and female parliamentarians have nearly equal representation with 44.7% female seats in the parliament and the average percentage share of female seats across OECD parliaments is still less than one-third in many OECD countries. According to latest statistics of IPU (2012) "Women in National Parliaments Database"[4], there are only 9 countries over 34 countries where the percentage share of female seats are more than one-third of the entire seats in OECD. In the rest, the number of women account for less than one quarter or even one-fifth of the

[2]For the related literature, see: Chapter4.

[3]The empirical studies also often emphasize on the preference differences between sexes. Their common argument has been that women are more likely than man invest in children and favour redistribution, they give priority to public policies related to their traditional roles as care givers in the family and society(Tho90; BC00; Duf03; CD98; EP02; CD04**?**)

[4]http://www.ipu.org/wmn-e/world.htm

entire parliament. For instance, by 2013, the percentage share of female parliamentarians in some of the advanced nations across OECD are as follows; the United states (17.8%), the United Kingdom (22.5%), Japan(8.1%), Canada(24.7%), Greece(21%), France(26.9%), Italy(31.4%), Germany (32.9%). Only 10 years ago, by 2003, these numbers were much more lower as; for the United states (14.3%), the United Kingdom (17.9%), Japan(7.1%), Canada(20.6%), Greece(8.7%), France(12.2%), Italy(11.5%), Germany (32.2%).

Correspondingly, chapter3 investigates the link between parental leave benefits, female political representation and child health outcomes. More specifically, I seek to assess whether the persistent underrepresentation of women in parliaments has played a role for the inefficacy of parental leave benefits on child health outcomes over the forty years across OECD countries. The paper organized as follows: Section (3.2) discusses the small theoretical contribution where I aim to modify the model of(RS82) with the interactive governance term -measured as the interaction of female political representation and parental leave benefits- Section (3.3) presents the data and specifies the empirical model. Section (3.4) provides the results of empirical estimations and investigates their robustness.

3.2 Prior Research and Theory

3.2.1 Previous Literature

A number of past studies have examined the relationship between public spending and child development outcomes (e.g public health expenditures-child mortality rates, public education spending-child educational attainment). Even though some studies have pointed out statistically significant positive relationship between public spending and child development outcomes[5], there are also diverging findings which emphasize on the inefficacy of political institutions or governance in policy-making that cause an insignificant relationship between public spending

[5]For the related literature see: Chapter 3.

and development outcomes.

The inadequacy of the governance[6] in policy making and reseource allocation is studied in two dimensions: political and economic. For instance corruption within government, where high government officials are likely to demand illegal payments (e.g bribes), is more accounted for the economic dimension of governance[7].On the other hand, participation

[6]In UNDP Governance for Sustainable Human Development Report, 1997, the core characteristics of Good Governance are described as follows;

- "Participation: Irrespective of class, race and gender,all citizens should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.
- Transparency: Transperancy is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.
- Accountability:Decision-makers in government, the private sector and civil society organizations are accountable to the public, as well as to institutional stakeholders. This accountability differs depending on the organization and whether the decision is internal or external to an organization.
- Equity: All men and women have opportunities to improve or maintain their well-being.
- Effectivenes&Efficiency : Process and institutions produce results that meet needs while making the best use of public reseources.
- Responsiveness: Institutions and process try to serve all stakeholders.
- Strategic Vision: Leaders and public have a broad a long-term perspective on good governance and human development, along with a sense of what is needed for such development, along with a sense of what is needed for such development. There is also an understanding of the historical, cultural and social complexities in which that perspective is grounded.
- Rule of Law: Legal frameworks should be fair and enforced impartially, particularly the laws on human rights."

(UNDP, 1997).

[7](Han86) is one of the first economists who emphasize on the inefficiency of educational expenditures in the US context, showing it empirically that greater expenditures per student do not result in parallel gains in educational achievement.(FHP98) have focused on the weak links between public health spending and the health status. They have mentioned that the institutional capacity is an indispensable component for the efficiacy of public health services in improving health status of people. (GVT02) have indicated that countries have high level of corruption, have higher infant mortality rates. Moreover (KKZL00) and (KKM04) show that government ineffectiveness have a strong direct negative impact on infant mortality. Similarly,(RS08), using the corruption index as an indicator of the governance, has found that public health and educational spending often does not yield the expected improvements in development outcomes such as child mortality and educational attainment.

in politics or the political representation of disadvantaged groups constitutes of the political dimension of governance.There are several studies which have been focused on the role of female political representation on public social expenditures[8]. However studies on the link between female political representation, public spending and child development outcomes are limited with single-country studies. Using quasi-experimental election outcomes (CF11) have found that higher female political representation leads higher primary educational attainment in India.(BCF11) have indicated that one standard deviation increase in women's political representation results in a 1.5 percentage point reduction in neonatal mortality.

This study contributes to this strand of literature by examining the link between female political representation, public spending on parental benefits and child health outcomes.

3.2.2 Theory

The represented model in the previous chapter has showed that child health function may change with the amount of parental leave benefits which is determined with s wage replacement rates. In Chapter 1, Equation(3.1) has obtained after a family utility maximization (3.2) subject to budget constraint (3.4) and with a given child health production function(3.3).

$$\frac{dH}{dsw} = F_m \frac{dM}{dsw} + F_h \frac{dh}{dsw} \tag{3.1}$$

$$U = U(X, H, L, h) \tag{3.2}$$

$$H = F(M, \mu, h, \xi) \tag{3.3}$$

[8]For the related literature see: Chapter 4.

where F_m, F_μ, F_ξ $F_h \neq 0$.

$$Y = N + wR = P_x X + P_m M + s(wh) \tag{3.4}$$

(s) varies across countries and governments determine the level of wage replacement rates by law. For instance, in the United States there is no entitlement for a paid leave,namely $s = 0$ and total parental benefits ($(s)wh$) that parents are entitled to receive during the leave period is zero. It is possible that if the parental leave is unpaid or paid at a low replacement rate parents would prefer to work instead of receiving the leave (Ros11). Following (SLDD92), (Lei05) has emphasized on the woman's time allocation between labor market and home for the maximization of family's utility. Considering the limited resources and therefore the opportunity cost occured between time spent in one activity and the other, she indicates that women maximize the utility of the family by weighing the costs and benefits of being at work and not. Both(Ruh00b) and (Lei05) have showed the positive impact of parent's time away from work on the child health outcomes unless the benefits paid during the leave period has an increasing impact on household income.(Tan05) has also obtained similar cross-country findings which show that weeks of unpaid parental leave do not have a significant effect on child health since the leave has been provided without any payment. As children of poor, single and low-educated working mothers are a key vulnerable population that was not reached by the US parental scheme. These mothers are often forced to work immediately after childbirth, and their newborn children are then placed in low-quality childcare. Even in the OECD area, there have been large disparities between different social welfare areas with respect to amount of social welfare spending allocation. Most of the social welfare spending goes to the elderly population over forty years due to the fact that population across the OECD is getting older. Although the recent economic crisis (2007/08) has made an increase on family-specific spending (includes parental leave benefits) with an idea to support future generations, social spending on the elderly amounted to 11% of GDP which is exactly half of the overall social welfare spending (22% of GDP)

in 2009. 7% is the share of public health expenditures in overall social spending and the remaining 4% of GDP share is divided among seven different categories which includes unemployment, housing, spending on active labor market programmes and spending on families. In 2009, the public spending on parental leave benefits was only 0.3%. As previously explained, one of the prerequisites of an effective and fair public resource allocation is the well-functioning representative democracy or having an equal voice in policy making, since even electorally accountable governments often fail to reflect the interests of disadvantaged groups such as women, poor or ethnic minorities(Pan03).

Parental leave benefits are the policies which target especially mothers for their efforts to care newborns and they are important policies for the female labour market outcomes as well. Considering this fact, parental leave policies are the preliminary social welfare policies which certainly reflects women's interests. Therefore one can assume that the underrepresentation of women in politics would be a factor for this inefffective redistribution over forty years and the reason for the insignificant relationship between parental leave payments and child health outcomes. Following the previous literature which often claim that female political representation is positively significant in policy decision making that reflects women's interests, the female political representation as a governance indicator may have role in determining the amount of parental leave benefits or level of the wage replacement rates that are allocated or determined by governments. Thus, budget constraint of the family (3.4) can be rewritten as following;

$$Y = N + wR = P_x X + P_m M + \alpha s(wh) \tag{3.5}$$

It is assumed that both partners participate in the labour force. This assumption ensures that woman contributes to household income as well.

The interactive term αs represents the interaction of female political representation and parental leave benefits as percent of parents' earnings. As explained in preceding lines, it is, at the same time, the shadow price of receiving the leave or opportunity cost of working.

The first order maximization conditions of the model in the previous chapter can be rewritten as following;

$$U_L = \lambda \tag{3.6}$$

$$U_X = \lambda P_x \tag{3.7}$$

$$U_h + U_H F_h = (1+\lambda)\alpha sw \tag{3.8}$$

$$U_h F_m = \lambda P_m \tag{3.9}$$

The model yields four demand equations for the four different goods in terms of prices and income;

$$X = D_x(P_x, P_m, Y, \mu, \alpha sw) \tag{3.10}$$

$$M = D_m(P_x, P_m, Y, \mu, \alpha sw) \tag{3.11}$$

$$h = D_l(P_x, P_m, Y, \mu, \alpha sw) \tag{3.12}$$

The effects of price changes on the level of child health can be obtained using the first differentiation of the child health production function;

$$dH = F_m dM + F_\mu d\mu + F_h dh \tag{3.13}$$

The effect of the prices on child health might be formulated with the help of (2.11) whilst assuming that $\frac{d\mu}{dP_i} = 0$ where $i = x, y, z$.

$$\frac{dH}{dP_x} = F_m \frac{dM}{dP_x} + F_h \frac{dh}{dP_x} \tag{3.14}$$

$$\frac{dH}{dP_m} = F_m \frac{dM}{dP_m} + F_h \frac{dh}{dP_m} \tag{3.15}$$

$$\frac{dH}{d\alpha sw} = F_m \frac{dM}{d\alpha sw} + F_h \frac{dh}{d\alpha sw} \tag{3.16}$$

Equations suggest that the interaction of governance and public spending on parental benefits as a percentage of earnings can be relevant for the child health.

3.3 Data and Empirical Specification

Table-7 provides the descriptive statistics for the key variables of interest. To examine the link between public spending on female political representation, public spending on parental benefits and child health outcomes, overall analyses have been done based on two different samples.The first sample shown in Panel A is used to analyze the role of the female political representation for the efficacy of parental benefits on child health outcomes without including any control variables. It covers 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States) from 1974 to 2010. Using the same econometric frameworks, the estimations which include control variables are done based on a sample that is shown in Panel B. It is a yearly balanced panel dataset which covers 14 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Ireland, Japan, Netherlands, Norway, Portugal , Sweden, Switzerland, the United Kingdom) from 1975 to 2010.

The model has the following framework to analyze the link between public spending on parental benefits, female political representation and child health outcomes.

$$lnc_{it} = \alpha g_{it} + \sigma w_{it} + \varphi L_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{3.17}$$

$$lnc_{it} = \delta lnc_{it-1} + \alpha g_{it} + \sigma w_{it} + \varphi L_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{3.18}$$

where the dependent variable lnc_{it} denote the natural log of child mortality rates. The data on mortality rates is from(IHM10b),"Infant and Child Mortality Estimates by Country (1970-2010)" which covers neonatal, postneonatal and under-5 mortality estimates.

L_{it} is the public spending on parental leave benefits as a percentage of female wages in manufacturing. w_{it} represents the female political repre-

Table 7: Summary statistics

	(1)	(2)	(3)
SAMPLES			
PANEL A: Female Political Participation, Parental Leave Benefits and Child Mortality (without controls)			
	Mean	**Std. Dev.**	**N**
Percentage share of Female Parliamentarians	0.172	0.118	777
Public spending on Parental Leave Benefits as a percentage of female wages in manufacturing	0.8	0.504	777
Female Political P.*Public Spending on Parental Benefits as a percent of female wages in manufacturing	0.158	0.166	777
The natural log of postneonatal mortality rate	0.923	0.523	777
The natural log of neonatal mortality rate	1.601	0.513	777
The natural log of under-5 mortality rate	2.117	0.497	777
PANEL C: Female Political Participation, Parental Leave Benefits and Child Mortality (with controls)			
Percentage share of Female Parliamentarians	0.823	0.47	504
Public spending on Parental Leave Benefits as a percent of female wages in manufacturing	0.198	0.126	504
Female Political P.*Public Spending on Parental Benefits as a percent of female wages in manufacturing	0.187	0.178	504
The natural log of postneonatal mortality rate	0.853	0.495	504
The natural log of neonatal mortality rate	1.528	0.483	504
The natural log of under-5 mortality rate	2.049	0.472	504
The share of population with health insurance coverage	97.911	7.496	504
Total Health Expenditures as a percent of GDP	7.932	1.45	504
Log(GDP per capita)	10.173	0.31	504
The female employment (aged between 15-64)/population ratio	0.584	0.111	503
The fertility rate (children per women aged 15 to 49 years old)	1.726	0.288	504

Column (1) of each sample show the mean values of observations with standard deviations represented in Columns (2). "N" stands for the number of observations in each sample. The first sample in Panel A, is a balanced panel data with one-year interval which include 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1974 to 2010. However, estimations which are done including control variables use a smaller sample (due to the data unavailability) which covers 14 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Ireland, Japan, the Netherlands, Norway, Portugal , Sweden, Switzerland, the United Kingdom) from 1975 to 2010.

sentation variable which is measured with the percentage share of female parliamentarians in national parliaments across OECD. The main independent variable of interest is the interactive governance variable g_{it}. It is the interaction of public spending on parental leave benefits (L_{it}) and the female political representation (w_{it}). In order to capture the direct and the indirect effects of the female political representation on child health outcomes, the variable w_{it} enters into the model both as an independent variable and interacted with the spending on parental benefits (g_{it}=w_{it}*L_{it}).

The data on the percentage share of female parliamentarians in national parliaments across the OECD is mainly from(IPU95), "Women in Parliaments: 1945-1995" and the series after 1995 is collected from the website of IPU (Inter-Parliamentary Union). All potential control variables are included in $\mathbf{x}_{it}$. Moreover, γ_i denote a full set of country dummies and μ_t denote a full set of year dummies. υ_{it} is an error term, capturing all other omitted factors, with $E(\upsilon_{it}) = 0$ for all i and t.

Similar to the previous chapter, the data for public spending on parental leave benefits as a percentage of female wages in manufacturing sector comes from (GB11),"Comparative Maternity, Parental, and Childcare Leave and Benefits Database" (1960-2010). The data on total health expenditures as a percentage of GDP is directly obtained from (OEC13c), "Health Data: Health Expenditure and Financing". It is assumed to be positively related with child health outcomes because government allocation or private investment on medical and health care facilities might be related to improved child health outcomes. Furthermore, the data on real GDP per capita at constant prices in 2005 USD are collected from (HSA12), Penn World Table 7.1. The inclusion of income is a necessary control for its possible effects on health which works through a variety of indirect channels (e.g., better nutrition, better housing, better sanitation). The transformation of the income variable to log is useful to capture the non-linearity. The data on fertility rates come from (OEC13b), "OECD Health Data: Demographic references". Furthermore the health insurance coverage has been used as an essential control variables which are assumed to be positively related with the child health.The data on the share of population with health insurance coverage are col-

lected from (OEC13e), " Health Data: Social Protection" and data for life expactancy is from (OEC13d), "Health Data: Health Status". Finally, the data on female employment to population ratio are collected from (OEC13a)"Employment and Labour Markets: Key Tables from OECD".[9]

3.4 Results

Before presenting the econometric evidence, it is instructive to consider some simple scatter plots of the data that contain the interaction variable of parental leave benefits and the female political representation (interactive governance term) across OECD countries. Figure 13-15 plot the interaction of public spending on parental leave benefits and the female political representation versus child mortality outcomes. The scatter plots are drawn based on a sample which covers 21 OECD countries for the period from 1974 to 2010. All figures reveal a negative association between the interactive governance term and child mortality rates.

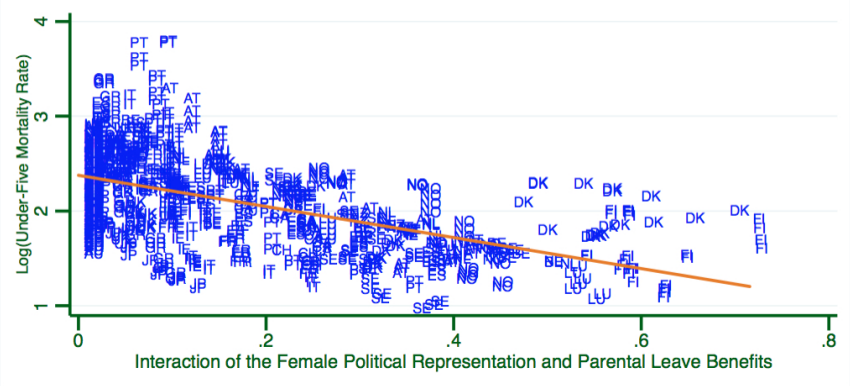


Figure 13: The Relationship Between the Interactive Governance Term and Neonatal Mortality Rates

To examine the relationship in a more robust fashion, I proceed issues econometrically. In the first chapter, I have examined the relation-

[9]For the detailed information on the literature which is followed for the selection of variables: see Chapter 2

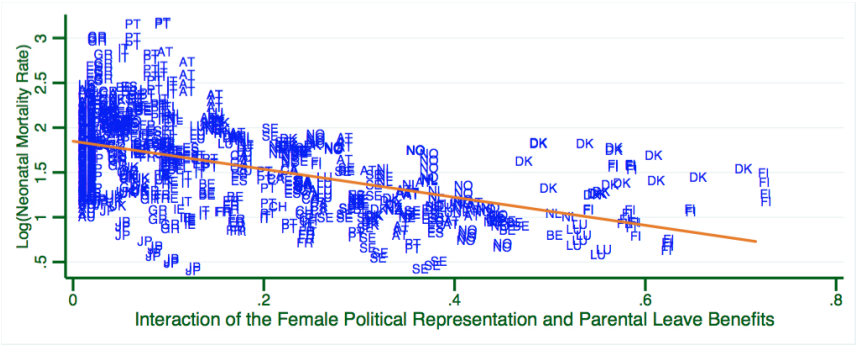


Figure 14: The Relationship Between the Interactive Governance Term and Postneonatal Mortality Rates

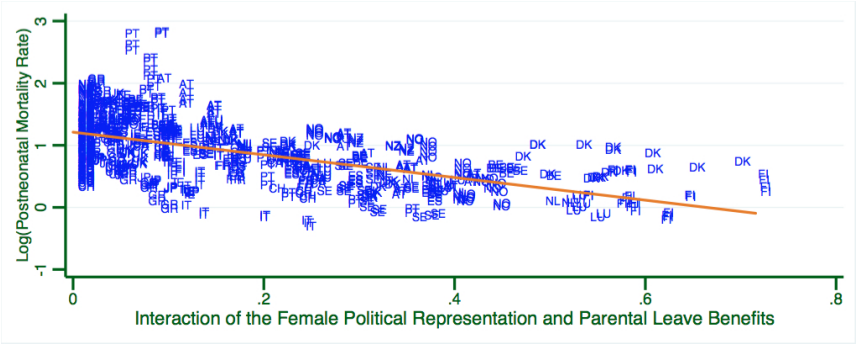


Figure 15: The Relationship Between the Interactive Governance Term and Under-Five Mortality Rates

ship between public spending on parental benefits itself and child health outcomes. Based on the evidence that there is no empirical relationship between public spending on parental leave benefits and child health outcomes, in line with equation (1) and equation (2), I test this relationship between the interactive governance term (the interaction of parental leave benefits and the female political representation) and child health outcomes.

Equation (3.17) is a standard fixed-effects panel data model. Countries are indexed by i, time is defined in terms of annual periods, by t.

γ_i denote time-invariant country-specific effects. First of all, I run regressions using the method of Pooled-OLS without controlling country dummies (γ_i) which allow the persistence of country-specific effects over time. Columns (1) in Panels A of Table(8-10) represent the Pooled-OLS estimates where the main regressands are neonatal, postneonatal and under-five mortality rates respectively. Pooled-OLS results indicate that the interaction variable of the female political representation and public spending on parental benefits has an highly high significant coefficient of 0.32217, 0.67713 and 0.45208 and public spending on parental benefits itself is insignificant. Columns (2) of Panel A, alternatively control for the time-invariant omitted factors. However, once country-specific time trends and country fixed-effects are included to the model interactive governance term turns to be insignificant and this result is robust to using any other estimation techniques. Alternatively, using equation (3.18), Columns (3) of Panel A represent the GMM framework estimates where the coefficient of the interactive governance term remain insignificant. The Wooldridge test has strongly rejected the null hyphothesis of no serial correlation. Following the existing cross-country parental leave and child health literature(Ruh00b; Tan05) remaining columns of Table (8-10) add the natural log of GPD per capita, the share of the population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and the female employment to population ratios as additional controls. In addition to fixed effect estimates in columns(4) of Panel B, columns (5) uses GMM and columns (6) report PCSE-AR(1) estimates where Prais-Winsten regression controls for the serial correlation.The evidence on the lack of a relationship between the interactive governance term and the child health outcomes is robust using additional controls as well.

Turning to control variables, health insurance coverage have negatively significant coefficient estimates under the fixed effect estimations (Columns 4) of Panel B in Table 8-10. The female employment ratio, GDP per capita and fertility rate have also significant coefficient estimates in some econometric frameworks but all methods are not support this result. Similar to results in the previous chapter, total public health expenditures

(as a percent of GDP) are not significant irrespective of any econometric framework.

The econometric methods in Panel C and D of each table uses first difference of the variables as their non-stationary represented in the second chapter with panel unitroot tests. The first difference of Log(GDP) per capita and fertility rates are significant in all estimations. Overall results that the female political representation has been relevant for the lack of a relationship between public spending on parental benefits and child health outcomes over the thirty years in OECD area.

Table 8: Political Responsiveness: Female Political Participation, Parental Leave Benefits and Neonatal Mortality Outcomes

	PANEL A			PANEL B		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
FPR*Public Spending on PLB	-0.32217**	0.22008	-0.00116	0.12661	0.02278	0.03898
	(0.12964)	(0.23187)	(0.05611)	(0.27604)	(0.11664)	(0.07951)
FPR	-0.41087***	-0.03385	0.03808	-0.00492	0.00475	-0.00876
	(0.15403)	(0.35108)	(0.07320)	(0.07119)	(0.03711)	(0.02269)
Public Spending on PLB	0.01972	-0.05295	0.00582	-0.07048	0.06664	-0.04143
	(0.03205)	(0.06979)	(0.01862)	(0.37527)	(0.13412)	(0.09230)
Lag(Log Neonatal M.)			0.84559***		0.84072***	0.75276***
			(0.01323)		(0.01744)	(0.03736)
Health Care Coverage				-0.00146*	-0.00067*	-0.00069
				(0.00076)	(0.00041)	(0.00048)
Total Health Exp.(%GDP)				-0.01959	-0.00317	-0.00324
				(0.01262)	(0.00370)	(0.00392)
Log(GDP)				-0.00481	-0.08345*	-0.03540
				(0.22238)	(0.05058)	(0.05113)
Female Employment Ratio				0.90349	0.12461	0.20433**
				(0.53021)	(0.11934)	(0.09901)
Fertility Rate				0.00891	0.06227**	0.01420
				(0.03133)	(0.02472)	(0.01840)
R-Square	0.81483	0.98332		0.98304		0.99446
Number of Cases	777	777	714	503	462	503
	PANEL C			PANEL D		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
ΔFPR*Public Spending on PLB	0.05312	0.13780**	0.07018	0.14869	0.08968	0.08493
	(0.06557)	(0.05480)	(0.05828)	(0.10295)	(0.08868)	(0.08941)
ΔFPR	-0.01118	-0.03090**	-0.02286	-0.31820***	-0.20711*	-0.22513**
	(0.01689)	(0.01424)	(0.01675)	(0.10325)	(0.10689)	(0.10227)
ΔPublic Spending on PLB	-0.10020	-0.19149***	-0.11206	-0.02348	-0.02356	-0.01882
	(0.08580)	(0.06596)	(0.08713)	(0.02047)	(0.02574)	(0.02437)
ΔLag(Log Neonatal M.)			0.42020***		0.46790***	0.34843***
			(0.05760)		(0.05557)	(0.05519)
ΔHealth Care Coverage				-0.00023	0.00034	0.00024
				(0.00056)	(0.00031)	(0.00060)
ΔTotal Health Exp.(%GDP)				0.00271	0.00453	0.00456
				(0.00552)	(0.00558)	(0.00503)
ΔLog(GDP)				-0.22373***	-0.22516***	-0.21257***
				(0.06212)	(0.05475)	(0.07684)
ΔFemale Employment Ratio				0.23208	0.11000	0.13467
				(0.15691)	(0.10610)	(0.12095)
ΔFertility Rate				0.08501**	0.05266*	0.06458***
				(0.03252)	(0.02715)	(0.02246)
R-Square	0.20460	0.25172		0.36461		0.47284
Number of Cases	756	756	693	489	448	489

Panel A-B represent some results on the link between parental leave benefits, female political representation and neonatal mortality rates without differentiating any variable to take into account stationary. The econometric frameworks in Panel A do not include any control variable. The dependent variable of interest is the logarithm of neonatal mortality rate which refers to the total number of infant deaths under twenty-eight days of age per 1,000 live births. The interaction between the percentage share of female parliamentarians and the public spending on parental leave benefits (as a percent of female wages in manufacturing) is the main regressor of interest. Pooled-OLS estimation result is presented in Column (1) of Panel A. Column (2) of Panel A show the fixed effect estimates with country dummies. The GMM estimate of Manuel Arellano and Stephen R. Bond (1991) is represented in column(3) of Panel A and is instrumented for log(under-five mortality) by using a double lag. Econometric specifications in Panel B investigate the relavant relationship including additional controls such as the natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. Column (1) of Panel B is the fixed effect estimation with country dummies. Column (2) shows the Arellano-Bond GMM estimation result which is instrumented for log(under-five mortality) by using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in column (3) which include the autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Panel C-D replicate same estimations on the link between parental leave benefits, female political representation and neonatal mortality rates with differentiating variables to take into account stationary. Except Pooled-OLS estimation in columns 1 all estimation techniques of Panel A-D include country specific time trends as well. All regressions include year dummies. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. Estimations without controls are done based on a sample which is a yearly balanced panel covers 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States) from 1974 to 2010. Estimations with controls are done based on a sample which is a yearly balanced panel covers 14 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Ireland, Japan, Netherlands, Norway, Portugal , Sweden, Switzerland, United Kingdom) from 1975 to 2010.One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB and FPR are the abbrevations for Female Political Representation and Parental Leave Benefits respectively.

Table 9: Political Responsiveness: Female Political Participation, Parental Leave Benefits and Postneonatal Mortality Outcomes

	PANEL A			PANEL B		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
FPR*Public Spending on PLB	-0.67713***	0.23071	0.01347	0.09486	0.04282	0.03356
	(0.17854)	(0.24069)	(0.05523)	(0.26288)	(0.10932)	(0.07395)
FPR	-0.55051***	-0.06432	0.02068	-0.00113	-0.00416	-0.00738
	(0.20294)	(0.35775)	(0.06931)	(0.06949)	(0.03573)	(0.02160)
Public Spending on PLB	0.03247	-0.05907	0.00069	-0.00774	0.02349	-0.03659
	(0.03727)	(0.07194)	(0.01682)	(0.35585)	(0.12049)	(0.08802)
Lag(Log Postneonatal M.)			0.85353***		0.84812***	0.73288***
			(0.01012)		(0.01713)	(0.03737)
Health Care Coverage				-0.00175**	-0.00061	-0.00074
				(0.00073)	(0.00046)	(0.00053)
Total Health Exp.(%GDP)				-0.01750	-0.00353	-0.00314
				(0.01221)	(0.00346)	(0.00387)
Log(GDP)				-0.09178	-0.05957	-0.04120
				(0.19775)	(0.04777)	(0.04799)
Female Employment Ratio				0.69663	0.11557	0.17745*
				(0.44101)	(0.10278)	(0.09123)
Fertility Rate				0.00096	0.04937**	0.00312
				(0.02979)	(0.02015)	(0.01793)
R-Square	0.75686	0.98434		0.98474		0.99448
Number of Cases	777	777	714	503	462	503
	PANEL C			PANEL D		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
ΔFPR*Public Spending on PLB	0.04961	0.13405**	0.05466	0.14185	0.09702	0.08330
	(0.06584)	(0.04945)	(0.05774)	(0.09588)	(0.07873)	(0.08313)
ΔFPR	-0.01223	-0.03209**	-0.01985	-0.30061***	-0.21577**	-0.22686**
	(0.01757)	(0.01354)	(0.01648)	(0.09738)	(0.09957)	(0.09627)
ΔPublic Spending on PLB	-0.08600	-0.17419**	-0.08254	-0.02364	-0.02385	-0.01711
	(0.08267)	(0.06595)	(0.08777)	(0.01949)	(0.02276)	(0.02324)
ΔLag(Log Postneonatal M.)			0.38660***		0.43099***	0.28516***
			(0.06435)		(0.06529)	(0.05599)
ΔHealth Care Coverage				-0.00038	0.00025	0.00013
				(0.00049)	(0.00037)	(0.00066)
ΔTotal Health Exp.(%GDP)				0.00291	0.00484	0.00490
				(0.00508)	(0.00509)	(0.00508)
ΔLog(GDP)				-0.22361***	-0.22555***	-0.20717***
				(0.06790)	(0.04879)	(0.07637)
ΔFemale Employment Ratio				0.19800	0.10170	0.13375
				(0.14758)	(0.10940)	(0.11947)
ΔFertility Rate				0.09310**	0.06371**	0.07625***
				(0.03336)	(0.02694)	(0.02122)
R-Square	0.19077	0.24784		0.38057		0.48197
Number of Cases	756	756	693	489	448	489

Panel A-B represent some results on the link between parental leave benefits, female political representation and postneonatal mortality rates without differentiating any variable to take into account stationary. The econometric frameworks in Panel A do not include any control variable. The dependent variable of interest is the logarithm of postneonatal mortality rate which refers to the total number of infant deaths between twenty-eight days and one year of age per 1,000 live births. The interaction between the percentage share of female parliamentarians and the public spending on parental leave benefits (as a percent of female wages in manufacturing) is the main regressor of interest. Pooled-OLS estimation result is presented in Column (1) of Panel A. Column (2) of Panel A show the fixed effect estimates with country dummies. The GMM estimate of Manuel Arellano and Stephen R. Bond (1991) is represented in column(3) of Panel A and is instrumented for log(under-five mortality) by using a double lag. Econometric specifications in Panel B investigate the relavant relationship including additional controls such as the natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. Column (1) of Panel B is the fixed effect estimation with country dummies. Column (2) shows the Arellano-Bond GMM estimation result which is instrumented for log(under-five mortality) by using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in column (3) which include the autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Panel C-D replicate same estimations on the link between parental leave benefits, female political representation and postneonatal mortality rates with differentiating variables to take into account stationary. Except Pooled-OLS estimation in columns 1 all estimation techniques of Panel A-D include country specific time trends as well. All regressions include year dummies. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. Estimations without controls are done based on a sample which is a yearly balanced panel covers 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States) from 1974 to 2010. Estimations with controls are done based on a sample which is a yearly balanced panel covers 14 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Ireland, Japan, Netherlands, Norway, Portugal , Sweden, Switzerland, United Kingdom) from 1975 to 2010.One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB and FPR are the abbrevations for Female Political Representation and Parental Leave Benefits respectively.

Table 10: Political Responsiveness: Female Political Participation, Parental Leave Benefits and Under-Five Mortality Outcomes

	PANEL A			PANEL B		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
FPR*Public Spending on PLB	-0.45208***	0.22394	0.00826	0.11921	0.03700	0.03974
	(0.12972)	(0.23224)	(0.05577)	(0.26792)	(0.11611)	(0.07653)
FPR	-0.45642***	-0.04108	0.02965	-0.00414	-0.00029	-0.00855
	(0.15144)	(0.34939)	(0.07196)	(0.06954)	(0.03755)	(0.02203)
Public Spending on PLB	0.02699	-0.05515	0.00314	-0.04807	0.04612	-0.04198
	(0.02964)	(0.06966)	(0.01816)	(0.36624)	(0.12926)	(0.08975)
Lag(Log Under-Five M.)			0.85071***		0.84419***	0.74659***
			(0.01149)		(0.01716)	(0.03702)
Health Care Coverage				-0.00155*	-0.00066	-0.00069
				(0.00074)	(0.00043)	(0.00050)
Total Health Exp.(%GDP)				-0.01889	-0.00324	-0.00316
				(0.01230)	(0.00344)	(0.00385)
Log(GDP)				-0.03071	-0.07307	-0.03822
				(0.20998)	(0.04855)	(0.04909)
Female Employment Ratio				0.82516	0.12631	0.19129**
				(0.49017)	(0.11358)	(0.09453)
Fertility Rate				0.00484	0.05775**	0.01024
				(0.03029)	(0.02285)	(0.01782)
R-Square	0.83305	0.98363		0.98357		0.99520
Number of Cases	777	777	714	503	462	503
	PANEL C			PANEL D		
	Pooled-OLS	FE	AB	FE	AB	PCSE
	(1)	(2)	(3)	(1)	(2)	(3)
ΔFPR*Public Spending on PLB	0.05852	0.14219**	0.07155	0.15231	0.09939	0.09159
	(0.06339)	(0.05176)	(0.05934)	(0.09953)	(0.08798)	(0.08505)
ΔFPR	-0.01343	-0.03290**	-0.02375	-0.31380***	-0.21064*	-0.22677**
	(0.01651)	(0.01380)	(0.01708)	(0.10219)	(0.10791)	(0.09816)
ΔPublic Spending on PLB	-0.10078	-0.18992***	-0.10754	-0.02503	-0.02415	-0.02003
	(0.08203)	(0.06486)	(0.08908)	(0.02034)	(0.02517)	(0.02338)
ΔLag(Log Under-Five M.)			0.41538***		0.46021***	0.33002***
			(0.06090)		(0.06067)	(0.05485)
ΔHealth Care Coverage				-0.00028	0.00030	0.00021
				(0.00052)	(0.00033)	(0.00061)
ΔTotal Health Exp.(%GDP)				0.00252	0.00408	0.00438
				(0.00521)	(0.00542)	(0.00495)
ΔLog(GDP)				-0.22201***	-0.21860***	-0.21004***
				(0.06387)	(0.05074)	(0.07523)
ΔFemale Employment Ratio				0.21997	0.10215	0.13120
				(0.14915)	(0.09904)	(0.11815)
ΔFertility Rate				0.08632**	0.05401**	0.06672***
				(0.03247)	(0.02673)	(0.02155)
R-Square	0.20368	0.25312		0.37410		0.47476
Number of Cases	756	756	693	489	448	489

Panel A-B represent some results on the link between parental leave benefits, female political representation and under-five mortality rates without differentiating any variable to take into account stationary. The econometric frameworks in Panel A do not include any control variable. The dependent variable of interest is the logarithm of under-five mortality rate which refers to the total number of infant deaths between twenty-eight days and one year of age per 1,000 live births. The interaction between the percentage share of female parliamentarians and the public spending on parental leave benefits (as a percent of female wages in manufacturing) is the main regressor of interest. Pooled-OLS estimation result is presented in Column (1) of Panel A. Column (2) of Panel A show the fixed effect estimates with country dummies. The GMM estimate of Manuel Arellano and Stephen R. Bond (1991) is represented in column(3) of Panel A and is instrumented for log(under-five mortality) by using a double lag. Econometric specifications in Panel B investigate the relavant relationship including additional controls such as the natural log of GPD per capita, share of population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios. Column (1) of Panel B is the fixed effect estimation with country dummies. Column (2) shows the Arellano-Bond GMM estimation result which is instrumented for log(under-five mortality) by using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in column (3) which include the autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Panel C-D replicate same estimations on the link between parental leave benefits, female political representation and under-five mortality rates with differentiating variables to take into account stationary. Except Pooled-OLS estimation in columns 1 all estimation techniques of Panel A-D include country specific time trends as well. All regressions include year dummies. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. Estimations without controls are done based on a sample which is a yearly balanced panel covers 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands,New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States) from 1974 to 2010. Estimations with controls are done based on a sample which is a yearly balanced panel covers 14 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Ireland, Japan, Netherlands, Norway, Portugal , Sweden, Switzerland, United Kingdom) from 1975 to 2010.One, two and three * indicate significance at the 10, 5 and 1% level respectively. PLB and FPR are the abbrevations for Female Political Representation and Parental Leave Benefits respectively.

Chapter 4

Does Gender Matter? Public Spending on Family Allowances and Female Political Representation

4.1 Introduction

As discussed in the previous chapter, the under-representation of women in politics over the forty years across OECD countries might be a reason for the insufficient resource allocation towards family-specific social policy areas.Considering parental leave benefits as one of the important family specific social policy areas, Chapter 3 indicates that the interaction of public spending on parental leave benefits and female political representation over the forty years across OECD countries has empirically been irrelevant on child health outcomes. Is allocation of total public spending really affected by"gender bias" in politics? Namely, could different proportions of women and men in political institutions result in unsimilar spending allocation decisions?

Contrary to unitary models, non-unitary models in family economics(MB80; MH81; LP93) suppose that differences in prefer-

ences of men and women influence familys' choices and women often have stronger preferences on childcare and child raising related to health. The empirical studies also often emphasize on the preference differences between sexes. Their common argument is that women are more likely than man invest in children and favour redistribution, they give priority to public policies related to their traditional roles as care givers in the family and society (Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05). Such sex differences are now leading to promotion of gender equality as a potent means of human development (Duf12; UN13). In particular, empowering women is believed to increase investments in children (Ban01). For instance, conditional cash transfers (CCT), which have recently been launched in many countries, target regular enrollment of the children into schools and getting regular health controls at the health centers (e.g receiving vaccinations). Considering the fact that women have higher tendency to spend for children in families, CCT qualify only mothers. A similar line of research has been done by (Duf00) who has analyzed the old age pension transfers in South Africa. She has shown that households do not function in a unique mechanism and the efficiency of the government transfers depends on the gender of the recipients. According to her findings, Old Age Pension program in South Africa has caused an improvement in child development (especially for girls) and this effect is entirely because of the pensions that women receive in order to use only for the child needs.

These gender differences in preferences in the society and within the family may also be brought into political institutions, influencing the voting behaviour of politicians and, therefore, the allocation of resources across spending categories. When investigating the role of female politicians in policy making, scholars have empirically analyzed the relationship between the fraction of female politicians in politics and various public spending categories. Considering existing studies in economics literature, the empirical evidence on the existence of gender specific decisions on different public spending categories is mixed so far. On one hand, it has been argued that female politicians contribute to an increase in public spending which concerns women's preferences. On the other

hand, there is empirical literature which finds no evidence that such policies are significantly affected by the gender of politicians. Theoretical literature also has diverging arguments on the importance of the identity of the politician, gender included, in shaping the allocation of resources across spending categories. In contrast to Down's(1957) Median Voter Theorem, Citizen Candidate Models of Besley and Coate (1997) and Osborne and Slivinski (1996) support the fact that the identity and preferences of a politician matters for the implementation of a policy. According to the Median Voter Theorem(Dow57), if the politicians only care about winning the elections and commit to implementing specific policies once elected, majority rule applies and policy decisions should only reflect the preferences of the median voter rather than the preferences of the politician. However, if the candidates could not commit to specific policies, the identity of the politician matters for policy implementation(OS96; BC97).

Based on the theory of Citizen Candidate Models which support the fact that the identity of a politician matters for the policy determination, this chapter firstly has aimed to contribute to the strand of empirical literature by studying the relationship between female political representation and public spending on famliy allowances across OECD Countries. Public spending on family allowances is one of the family-specific policies that plays an important role in helping families for the childcare and child raising which the literature suggests is one of the woman's primary concerns. The preliminary result of this chapter is the lack of a relationship between the female political participation and public spending on family allowances can be interpreted in three ways. 1-The result might be consistent with the Median voter theorem, rather than Citizen Candidate Models, suggesting that politicians' preferences and identities do not matter in public policy making. 2- Preferences and the gender identity of the politicians might still matter for the policy determination but the preferences of the women who involved in political activities might be close to those of their male colleagues. 3- Gender identity of the politician might matter but the insignificance of the female political participation in policy-decision making may depend on the under-representation of women in political institutions.Namely, the role of female politicians

may start to be relevant in terms of bargaining power over policy making and the governmental resource allocation when the percentage share of the female politicians reach a given threshold. As discussed in the previous chapter, the under-representation of women in politics over the forty years across OECD countries might be a reason for the insufficient resource allocation towards family-specific social policy areas. Therefore, I further aimed to analyze whether this lack of a relationship may turn to be a significant relationship after the number of female politicians reach a critical mass threshold in terms of bargaining power in policy making.

The paper is organized as follows: Section 4.2 discusses the theoretical background 4.3 presents recent empirical studies on the relationship between female political participation and public policies. Section 4.4 presents the data, specifies the empirical model and provides the first results. Section 4.5 investigates the robustness of the releavant results.

4.2 Theoretical Background

The theoretical background for this study is based on Citizen Models of Political Economy that the identity of a politician matters for the policy determination(BC97; OS96). Politicians if they can not commit on moderate policies before being elected, the identity and the individual preferences of the politician matters for policy determination rather than the preferences of median voter. Since existing political institutions cannot enforce full policy commitment such models of policy-making predict that increases in political representation afforded to a disadvantaged group will enhance its influence on policy. It is commonly argued that the representation of disadvantaged groups such as women, poor or ethnic minorities can translate into public policy outcomes which reflects the preferences of such groups. For instance (Pan03) has pointed out that policies chosen by minority politicians might reflect the policy preferences of minorities. Her empirical results show that increasing proportions of minority representation increase the level of transfers going to this group. Similarly, the representation of women can translate into public policy which reflects women's preferences.

Following the theory of separate spheres bargaining model of (LP93), I propose a framework of distribution related with the political participation of women and men.

Here I characterize the sources of potential gains of political participation of the man and women who have "*collaborative*" form of utility. It is assumed that they have different public policy preferences with respect to their gender identities but there is a simple Cournot equilibrium in the provision of public goods by women and men to household, assuming that socially prescribed gender roles assign primary responsibility for certain activities in households. The general utility function U_i is defined over a vector of public consumption goods (q_1, q_2), private consumption goods (x_i) and leisure (L_i) where $i = m, f$. m represents the man and f represents the woman. The preferences of the woman and men are represented by the von Neuman-Morgenstern utility functions as following;

Specifically, the individual's utility function is assumed to be strictly quasiconcave and monotone increasing in all its arguments and to possess continuous second partial derivatives.

$$U_m(x_m, q_1, q_2, L_m) \tag{4.1}$$

$$U_f(x_f, q_1, q_2, L_f) \tag{4.2}$$

where x_m and x_f are private consumption goods, L_m and L_f is leisure time for the man and women respectively. q_1 and q_2 are public goods that are consumed jointly. Thus, it is assumed that the interdependence between individuals operates only through consumption of the public goods. For the simplicity, it is assumed that there are four types of goods including leisure. With Nash bargaining, the equilibrium values of x_m, x_f, q_1 and q_2 are those that maximize the product of gains to cooperation between man and woman. The form of utility function is assumed as "*collaborative*" where the man's utility depends on women's utility or vice versa. These gains are defined in terms of a *threat point utility* which represents a equilibrium utility point. Namely, Nash Social Welfare function is a symmetric Cobb-Douglas function as following;

$$N = (U_m - T_m)(U_f - T_f) \tag{4.3}$$

The utility that men receive in the Nash bargaining solution is an increasing function of the utility that women receive at the threat point. For instance, an increase in the threat point utility of men and a decrease in that of women will cause an increase in the Nash bargaining solution utility of men and a decrease in that of women.

The individuals face a time constraint as following;

$$t_i = l_i + L_i + k_i \tag{4.4}$$

where $i = m, f$. More explicitly time constraint functions for each individual can be written as following;

$$t_m = l_m + L_m + k_m \qquad t_f = l_f + L_f + k_f \tag{4.5}$$

t_i is the total time available to individual i and l_i is time devoted to market work by i. k_i is the time which is spent in form of a political activity which affects the public good allocation. Following Citizen Candidates Model, It is assumed that increases in political participation of the individual will enhance its influence on public good allocation. Therefore the time that individuals spend for the political activities is the shadow price for having prefered public good as well.

Individual i faces a budget constraint as well.

$$p_i x_i + w_i L_i + p_1 q_1 + p_2 q_2 = Y_i \tag{4.6}$$

where $p_1 = k_m$ and $p2 = k_f$ are equal since k_i is the opportunity cost of obtaining the public good.

To derive the demand functions for the goods, the Nash Social Welfare Function will be maximized as following;

$$\begin{aligned} N = &[U_f(x_f, L_f, q_1, q_2) - T_f(k_f, k_m, w_f, p_f)] \\ &[U_m(x_m, L_m, q_1, q_2) - T_m(k_m, k_f, w_m, p_m)] \end{aligned} \tag{4.7}$$

subject to total budget and time constraints;

$$s.t \quad p_m x_m + p_f x_f + w_m L_m + w_f L_f + k_m q_1 + k_f q_2 = Y_m + Y_f \tag{4.8}$$

$$s.t \quad t_f + t_m = l_f + L_f + k_f + l_m + L_m + k_m \tag{4.9}$$

This yields the demand functions;

$$x_m = x_m(k_m, k_f, p_m, p_f, w_m, w_f, Y_m, Y_f) \tag{4.10}$$

$$x_f = x_f(k_f, k_m, p_f, p_m, w_f, w_m, Y_f, Y_m) \tag{4.11}$$

$$q_1 = q_1(k_m, k_f, p_m, p_f, w_m, w_f, Y_m, Y_f) \tag{4.12}$$

$$q_2 = q_2(k_m, k_f, p_m, p_f, w_m, w_f, Y_m, Y_f) \tag{4.13}$$

However, up to this point it is assumed that the form of the utility function is "*collaborative*". I have started with a simple Cournot equilibrium in the provision of public goods by women and men, assuming that socially prescribed gender roles assign primary responsibility for certain activities in households. However in the absence of a cooperative agreement, each individual decides unilaterally on the level of her/his preferred public good (q_1 or q_1) consumed by the households. The above-obtained results change once the form of the utility function is assumed as "*egoistic*" or once they have different preferences on the public good allocation inside the household. The common argument of the previous empirical studies in political economy is that women are more likely give priority to public family policies (e.g family allowances, child cash benefits) with respect to their traditional roles as care givers in the family and society related to child health and education(Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05). For example, child care subsidies and child allowances are often regarded as women's issues. This linking of women's and children's welfare with child-based subsidies is rooted in the gender assignment of child care: mothers expect and are expected to assume primary responsibility for their children[1].

[1] "As Crawford and Pollak (1989) point out, it is often asserted that mothers are primarily responsible for child care in three senses: first, it is mothers who find a child care provider and make the arrangements; second, it is mothers who take time off from work when a child

In a noncooperative enviornment the utility function of the man and women will be as following;

$$U_m(x_m, q_1, L_m\bar{q_2}) \tag{4.14}$$

$$U_f(x_f, q_2, L_f\bar{q_1}) \tag{4.15}$$

Women choose x_f and q_2 to maximize her utility $U_f(x_f, q_2, L_f\bar{q_1})$ subject to $p_f x_f + p_2 q_2 + w_m L_m = Y_f$ where q_1 is the level of public good preferred by the man. The decision leads to a set of reaction functions;

$$x_f = x_f(p_2, p_f, w_f, \bar{q_1}) \tag{4.16}$$

$$q_2 = q_2(p_2, p_f, w_f\bar{q_1}) \tag{4.17}$$

$$L_f = L_f(p_2, p_f, w_f\bar{q_1}) \tag{4.18}$$

It is previously assumed that k_f is the price of having prefered public goods through the time spent for the political activity participation. The price of possessing the preffered public good k_f equals to p_2. Participation to the political activities might be in the form of direct participation through having a role in policy-making in political institutions. It might be through working in political organizations and unions. Even though it is an indirect participation, in order to choose proper representatives, participation to elections are the activities require time allocation. Using this equality function $k_f = p_2$, the demand functions of women can be rewritten as following;

$$x_f = x_f(k_f, p_f, w_f, \bar{q_1}) \tag{4.19}$$

$$q_2 = q_2(k_f, p_f, w_f\bar{q_1}) \tag{4.20}$$

$$L_f = L_f(k_f, p_f, w_f\bar{q_1}) \tag{4.21}$$

The female demand will be the function of both political participation k_f and the government allocation to the other public goods such as $\bar{q_1}$.

is sick or when child care arrangements collapse; and third, it is mothers who "pay" child care expenses from their discretionary incomes"(LP93).

Similarly the man's demand functions for (x_m, q_2, L_m) will depend on his political participation and the government allocation to the other public goods such as women's most prefered policies $\bar{q_2}$.

$$x_m = x_m(k_m, p_m, w_m, \bar{q_2}) \tag{4.22}$$

$$q_1 = q_1(k_m, p_m, w_m \bar{q_2}) \tag{4.23}$$

$$L_m = L_m(k_m, p_m, w_m \bar{q_2}) \tag{4.24}$$

Next section discusses the existing empirical research on the female political participation and public spending on policies which take into account women's interest.

4.3 Prior Research

Existing single-country studies on the relationship between female political participation and policies that concern women's interests have heterogeneous results.(Tho91), using data gathered from a 1988 survey of members of the lower houses of the state legislatures of 12 US states, reveals that women in states with the highest percentages of female representatives introduce more priority bills dealing with issues of women and children than men in their states. Correspondingly, employing data on bill introduction in Argentine Chamber of Deputies and the U.S House of Representatives,(Jon97) has pointed out that the gender of legislators matter in investing on the areas concern women rights, families and children. Moreover, (Wän09), using parliamentary survey studies carried out in the Swedish Parliament, has emphasized on the necessity of female representation to take into account the women's interests in policy-making. Her findings show that women members of the parliament address issues of social welfare policies such as famliy or health care more than their male colleagues. A more recent work on Swedish municipalities by (Sva09) has found a positive causal impact of female representation on public spending allocation on education and childcare. Similarly (LN03), using the 2001 British Representation Study survey of 1,000

national politicians, have emphasized on sex differences of legislators in policy making related to womens issues. One of the other applications to this line of models has been done by (CD04) who carried on a survey for all investments in local public goods in sample villages of two districts in India. They have found that, female members of reserved village councils make more investment in drinking water than male members in where women complain more often then men about drinking water. (Reh07), similarly with (DC91) has found a dramatic movement of women into US State Legislators over the past quarter century for a robustly significant 15% share of the rise in state health spending. In contrast to these single-country findings on the positive efficiency of female political representation for the policies related to women and children issues, a recent working paper by (AGH12) on Flemish Municipalities has found contradictory results claiming that higher female representation in the local parliaments is not associated with higher spending. Furthermore, an empirical study from Italian municipalitiesł by (RT11) has found no evidence on a significant relationship between female politicians and social expenditures until the number of women politicians reach a certain threshold supporting the fact that, even though Italy is one of the most developed countries, has still very few numbers of female politicians in parliaments similar to many other countries.

Although existing single-country studies have ambigious results, empirical macro level studies have so far agreed on the positive effectiveness of female politicians on various policy outcomes such as social welfare spending, health spending, spending on maternity and parental benefits, education expenditures. (BB07) investigates the influence of womens representation on social welfare spending in national legislatures within 12 capitalist democracies during the period from 1980 through 1999 and they have found a strong support for the hypothesis that womens political representation increases social welfare spending. In a study of the impact of womens representation in legislative power on policy outcomes including health, education, social welfare spending, (Che10) finds a positive effect of female legislators on government expenditures of social welfare. (BR10) find a strong impact of womens presence in parliament on total

public family expenditures using fixed effects model (Kit08), with systematic analyses of 19 OECD countries between 1970 to 2000, has showed that women's parliamentary presence significantly influences the maternal and parental leave policies.

This paper contributes to this strand of cross-country literature by studying public spending on famliy allowances as the main field of interest.

Previous studies on the women's representation in parliaments and various public spending outcomes often have causal claims. However, an accurate and reliable estimation on the causality is challenging and burdensome for many reasons such as the endogeneity problem. Prior cross-country literature examining the impact of womens political representation in a range of public policy contexts have often neglected the problem of reverse causality which makes the results of those studies questionable. Reverse causality might occur due to the women empowerment role of public social welfare spending. Social welfare policies (e.g education, health, maternity policies) empower women in socio-economic life. Therefore social welfare spending can also cause an increase in the female political participation. For instance there is no maternity leave policy or childcare support for the female members of the UK House of Commons and the members of Canadian Parliament. This would undoubtedly be a reason for women to delay seeking electoral office. (Che10) is the only cross-country study so far considers the reverse causality problem by instrumenting the percentage of female parliamentarians with gender quotas. However results are again questionable given that gender quotas in itself might be the consequences of the insufficient representation of women in policy decision making. Possible reverse causality problem can lead to biased coefficient estimates and wrong conclusions about theoretical propositions but most dangerously if weak and wrong instruments are used then the sampling distributions of instrumental variable statistics are in general nonnormal, and standard instrumental variable point estimates, hypothesis tests, and confidence intervals become unreliable.

The negligence of omitted variable bias is also one of the other factors make prior cross-country studies questionable. Some of them have

neglected using country fixed effects (e.g (BB07)), lagged dependent variables for the historical perspective of phenomenon[2](Che10; Kit08). Moreover, prior cross-country applications are based on panel data framework with small numbers of time span (Che10; BR10; Kit08). The usual fixed effect estimator is inconsistent when the time span is small(Nic81). In addition to existing studies, I apply the generalized method of moments (GMM) estimator of Arellano and Bond. Furthermore, contemporaneous and serial correlation across the countries are the important problems that previous studies have ignored as well. To control for contemporaneous correlation across countries, I apply panel corrected standard errors following (BK96; BK95). I also focus on the autoregressive processes of order 1 (AR(1)) which indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation.

To sum up, this overview reveals several gaps in the cross-country prior research on the role of female political representation and policy outcomes in OECD setting. First of all there is no comparative study examining the relationship between female representation in parliaments and public spending on family allowances. It is important to emphasize that public spending on family allowances is one of the important public policies supporting families for the cost of raising children related to schooling and health which are the main concerns of women as literature suggests. Additionally, this study tests the research question with different subsamples to deal with the cross-country heterogeneity bias. There are some traditional OECD countries which are for long, at the top of the list of an established rank order of countries according to the fraction of female parliamentarians. Their high level women's political representation role may translate into more policies considering women's preferences relative to countries that have recently joined the OECD. This raises doubt about whether traditional OECD countries are driving the positive relationship between women's political representation and public spending on family allowances. I therefore examine the relationship between women's political representation and public spending on fam-

[2]The relationship between female political participation and public social spending is not static and depends in part on the existing level of public social expenditure.

ily allowances both excluding and including these new OECD countries with different subsamples. Moreover, no comparative study up to now tests the research question with different econometric specifications to deal with the problems such as autocorrelation and contemporaneous correlation. Furthermore, this study contibutes to this strand of literature by studying the relationship between women's parliamentary representation and public spending on family allowances both in absolute terms (as a percentage of GDP) and relative terms(as a percentage of total government spending. Lastly, considering the relevant literature, this study is the first attempt which analyze the role of critical mass issue on the relationship between female political participation and family allowances.

This study has filled these gaps extending also the time period to 2008 and enlarging the geographical coverage to 27 OECD countries. The overall results support two basic hyphothesis; a) there is no robust evidence for a positive significant relationship between the fraction of female parliamentarians and public spending on family allowances in the OECD setting. b) Policy changes in terms of public spending choices on family allowances can be driven by the female politicians only when the percentages of women in the parliaments exceed a remarkable value. Related empirical studies on the critical mass concept and public spending are mainly single-country works[3] and this paper will be the first attempt to analyze the threshold effect in cross-country settings where main field of interest is the public spending on family allowances.

The research on the influence of the critical mass of women relies primarily on (Kan77)'s foundational study. She has hypothesized that women would not be able show their influence in a male-dominated corporate enviornment, where men (dominants) constitute more than 85 percent and women (tokens) constitute less than 15 percent of total, since they are subject to performance pressures, role entrapment and boundary heightining. Although her work is the earliest source often cited on

[3]The most influential work on the critical mass is (Tho94), who focuses on the effects of different proportions of women on public policy in 12 state legislatures in the United States. She finds some impact of more women on policy outcomes, especially sponsoring and passing bills concerning women and children issues. However, she also suggests that a critical mass exists in the 1520 per cent range of women legislators.

the topic and did not deduce a critical mass' threshold for a political enviornment, some political scientists have attempted to determine a critical mass threshold at which elected female politicians can start to have influence on public spending decisions. However, the determination of a critical mass threshold is still problematic and undertheorized in political science literature. Related literature can not answer whether there is a single threshold which would be universially applied. In the literature, threshold has been variously identified at different levels such as 15, 20, 25 or 30 percent(BCM07; SM02). Drawing on previous studies, I identify four different thresholds equal to 15, 20, 25 and 30 per cent of women over total parliamentary seats. Afterwards I test them to examine whether there exists a unique threshold at which the number of women translates into more public spending on family allowances. Each threshold is represented with a dummy variable as a proxy of gender bargaining power, which takes value equal to 1 when the share of women's seats exceeds the threshold itself. Overall findings show that a positive relationship between the fraction of female parliamentarians and public spending on family allowances exists only when the highest threshold is passed (30%). However, it is important to note that this paper does not claim on the existence of a causal connection between these two variables.

4.4 Data Description, Econometric Model and Empirical Results

Before empirically addressing the role of critical mass in public spending decisions, I firstly look at whether there is a relationship between the fraction of female parliamentarians and public spending on family allowances. In fact, if there is a relationship, there is no reason to assume that female parliamentary representation is currently irrelevant but could be relevant in affecting the allocation of public spending after reaching a certain critical mass threshold.

4.4.1 The Relationship Between Female Parliamentary Representation and Public Spending on Family Allowances

Table 11 provides descriptive statistics for the key variables of interest. Overall analysis are based on three different samples. The first sample at Panel A is called as *base sample* which covers 19 countries[4] from 1980 to 2008[5]. It is the full sample and includes countries which has the complete data on family allowances (as a percentage of GDP) from the initial year of OECD Social Expenditure Database (1980). The second sample at Panel B covers 27 countries[6] also including countries having joined the OECD recently. There are some traditional OECD countries which are for long, at the top of the list of an established rank order of countries according to the level of female parliamentary representation, and their high level representation may translate into larger amount of spending compare to countries having joined the OECD recently. Therefore, the second sample also includes countries such as Korea, Slovakia, Poland and the Czech Republic where the number of female politicians in parliaments is arguably lower compared to others. The second sample at Panel B is restricted in terms of time span, from 1995 to 2008, due to the incomplete data for those countries before 1995. In contrast to first two samples, the third sample at Panel C uses public spending on family allowances as a percentage of total government spending to analyze the relationship in relative terms (as a percentage of tal government spending) rather than absolute terms (as a percentage of GDP). The third sample covers the same countries and the same period of second sample[7].

[4] Australia, Belgium, Canada, Denmark, Finland, France,Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States

[5] Year 2009 is excluded due to the missing observations on family allowances for Switzerland in this year

[6] Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom and the United States

[7] It excludes only Japan due to the absence of relevant data on family allowances as a percentage of total government spending.

Table 11: Summary statistics

	(1)	(2)	(3)
SAMPLES			
PANEL A: Base Sample			
	Mean	**Std. Dev.**	**N**
Public Spending on Family Allowances as a percentage of GDP	0.866	0.553	551
The fraction of Female Parliamentarians	17.392	11.322	551
(Lag) Public Spending on Family Allowances as a percentage of GDP	0.867	0.552	550
Population rate of the citizens below 15 years old	0.193	0.03	551
Population rate of the citizens above 65 years old	0.141	0.023	551
Log(GDP per capita)	10.185	0.308	551
Female Labor Force Participation Rate	60.035	11.492	551
Female Educational Attainment (aged between 15-44)	11.022	1.705	551
Public and Mandatory Private Spending on Old-Age Benefits	6.774	2.417	551
Unemployment Rate	7.433	4.052	551
Cabinet composition (Schmidt-Index)	2.413	1.523	550
Voter Turnout in Election	75.119	14.221	551
Electoral Fractionalization of the party-system (Rae-Index)	73.794	8.858	551
Legislative Fractionalization of the party-system (Rae-Index)	67.642	11.581	551
Augmented Index of Constitutional Structures	1.904	2.059	551
PANEL B: Base Sample with Neo-OECD Countries			
(Regressand:Public Spending on Family Allowances as a percentage of GDP			
	Mean	**Std. Dev.**	**N**
Public Spending on Family Allowances (%GDP)	0.872	0.556	378
The Fraction of Female Parliamentarians	21.916	10.734	378
(Lag) Public Spending on Family Allowances (%GDP)	0.874	0.555	377
Population rate of the citizens below 15 years old	0.468	1.221	378
Population rate of the citizens above 65 years old	0.145	0.027	378
Log(GDP per capita)	10.25	0.365	378
Female Labor Force Participation Rate	63.324	8.412	378
Female Educational Attainment (aged between 15-44)	11.968	1.211	378
Public and Mandatory Private Spending Old-Age Benefits	7.485	2.4	378
Unemployment Rate	7.267	3.822	378
Cabinet composition (Schmidt-Index)	2.57	1.506	349
Voter Turnout in Election	72.486	14.165	350
Electoral Fractionalization of the party-system (Rae-Index)	75.852	7.893	350
Legislative Fractionalization of the party-system (Rae-Index)	70.11	10.102	350
PANEL C:Base Sample with Neo-OECD Countries			
(Regressand:Public Spending on Family Allowances (%Total Government Spending)			
	Mean	**Std. Dev.**	**N**
Public Spending on Family Allowances (% Total Gov.Spending)	2.033	1.335	364
The Fraction of Female Parliamentarians	22.499	10.503	364
(Lag) Public Spending on Family Allowances (% Total Gov.Spending)	2.038	1.334	363
Population rate of the citizens below 15 years old	0.481	1.243	364
Population rate of the citizens above 65 years old	0.143	0.026	364
Log(GDP per capita)	10.246	0.372	364
Female Labor Force Participation Rate	63.448	8.545	364
Female Educational Attainment (aged between 15-44)	11.931	1.217	364
Public and Mandatory Private Spending Old-Age Benefits	7.476	2.43	364
Unemployment Rate	7.381	3.847	364
Cabinet composition (Schmidt-Index)	2.63	1.507	335
Voter Turnout in Election	72.887	14.299	336
Electoral Fractionalization of the party-system (Rae-Index)	75.967	7.98	336
Legislative Fractionalization of the party-system (Rae-Index)	70.376	10.152	336

Columns (1) of each sample show the mean values of observations with standard deviations represented in Columns (2). "N" stands for the number of observations used in samples. The first sample in Panel A, is a balanced panel data at one-year intervals for 19 countries between 1980 and 2008: Australia, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. The second sample in Panel B adds eight more countries (Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom and the United States) which have recently joined to OECD and could not be included to first sample due to the data incompleteness for previous years from 1995. The third sample covers same units (except Japan due to the data unavailability) and time span (1995-2008). In contrast to first two samples, the third sample takes into account public spending on family allowances as a percentage of total government spending (in relative terms) rather than public spending on family allowances as a percentage of GDP (in absolute terms).

For all samples there is a substantial variation in public spending on family allowances: for the first sample shown in Panel A, the mean value of public spending on family allowances (% of GDP) is 0.886%, the standard deviation is 0.553%. For the larger second sample, mean value of public spending on family allowances (% of GDP) is 0.872% , and the standard deviation is 0.556%. For the third sample, the mean value of public spending on family allowances as a percentage of total government spending is %0.886, and the standard deviation is 0.553%.

The main independent variable is the fraction of female parliamentarians in lower chambers[8]. The mean score of the fraction of female parliamentarians is 17.392 %, with Sweden (47.3%) being the highest and Korea (2%) is the lowest.

The panel data model has the following framework which will be the basis of my paper to analyze the relationship between female parliamentary representation and the public spending on family allowances;

$$y_{it} = \alpha w_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{4.25}$$

where y_{it} denotes public spending on family allowances as a percentage of GDP of country i in period t for the first two samples. For the third sample, it represents public spending on family allowances as a percentage of total government spending of country i in period t. The main independent variable is w_{it} and represents the fraction of female parliamentarians (the percentage of female seats) in lower chambers across OECD. Data on family allowances comes from (OEC13f), Social Expenditure Statistics. The share of female seats in lower chambers is mainly from the (IPU95),Women in Parliaments: 1945-1995 and the series after 1995 is collected from the website of IPU (Inter-Parliamentary Union). All other potential control variables are included in $\mathbf{x}_{it}$. Moreover, γ_i denote a full set of country dummies and μ_t denote a full set of year dummies. υ_{it} is an error term, capturing all other omitted factors, with $E(\upsilon_{it}) = 0$ for all i

[8]I employ the data of female parliamentarians in the lower chamber because the election results do not appear in the upper chamber for some countries with a bicameral system, such as in Canada.

and t. Model is initially estimated using Pooled-OLS estimation method which excludes country dummies, γ_i. As it is well-known, strict exogeneity assumption is one of the crucial necessity for the unbiased and consistent estimates under OLS specification. Strict exogeneity assumes that idiosyncratic error term (υ_{it}) is uncorrelated with the individual specific effects. Since the pooled regression model neglects the heterogeneity across individuals and assumes that all individuals have a unique effect, pooled-OLS estimator will be biased and inconsistent. But the fixed effect estimator will be consistent since it allows for the heterogeneity among individuals by assuming each one to have its own specific effect. As an alternative to pooled-OLS framework, I therefore used the fixed effect estimation technique to control for the country specific time invariant characteristics. Moreover, I also include country-specific time trends for the country-specific time-variant omitted factors.

Furthermore, I follow the related literature for selecting control variables such as the real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old to take into account general economic, labor market situation and demographic development. I have also added female labor force participation rate and female educational attainment for 15-44 year old women to take into account general social development as well. The data on real GDP per capita at constant prices in 2005 USD are collected from (HSA12), Penn World Table 7.1[9] and the data on female educational attainment (for 15-44 years old women) comes from (IHM10a),Educational Attainment and Child Mortality Estimates by Country (1970-2009)[10]. Furthermore, the data on female labor force participation rate is obtained from(ILO12), Online Key Indicators of the Labour Market database. In addition, the data on unemployment rate as a percentage of civilian labour force comes from (OEC10a), "Labour Force Statistics: Summary tables", OECD Employment and Labour Market Statistics. The data on population rates is from (UN12), Department of Economic and Social Affairs (Population

[9]Definition: PPP Converted GDP Per Capita (Chain Series), at 2005 constant prices.

[10]Female educational attainment is represented with mean years of education of women aged between 15-44.

Division, Population Estimates and Projections Section). Finally, the additional covariates to check the robustness of main regressions" results are from (AWE^{+}12) Comparative Political Data Set I 1960-2010. To test the validity of conclusions, I subject five different robustness tests to regressions which analyze the relationship between the fraction of female parliamentarians and family allowances[11].

To further take into account past occurrences, the lagged dependent variable, $lny_{i,t-1}$, is also added on the right hand side of the regression equation.

$$y_{it} = \delta y_{it-1} + \alpha w_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{4.26}$$

Before discussing the benchmark results, it is useful to look at the simple bivariate relationships between the fraction of female parliamentarians and public spending on family allowances. Figure (16)[12] is the scatter plot, which shows an ambiguously positive relationship, and corresponds to the cross-sectional relationship between the precentage share of female parliamentarians and public spending on family allowances.

I further investigate these issues econometrically. Table 12 shows the estimation results on the relationship between the percentage share of female parliamentarians and the public spending on family allowances based on three different samples. The estimation frameworks in Panel A and Panel D use the base sample which is a panel data at one-year intervals for 19 countries between 1980 and 2008. It is the full sample and includes countries which have the complete data on public family allowances (as a percentage of GDP) from the initial year of OECD Social Expenditure Database (1980). Panel B and Panel E show estimates based on the second sample where the main regressand is public family allowances (as a percentage of GDP) as in the first sample but this additionally includes countries that have recently joined to OECD. Panel

[11] For the detailed information on the variables used for robustness tests see: Section 4.5

[12] *Notes:* Values are averaged by country from 1980 to 2008. Country Abbreviations stand for : Australia (AU), Belgium (BE), Canada (CA), Denmark (DK), Finland (FI), France (FR), Greece(GR), Ireland(IE), Italy(IT), Japan(JP), Luxembourg(LU), Netherlands(NL), New Zealand(NZ), Portugal(PT), Spain(ES), Sweden(SE), Switzerland(CH), United Kingdom(UK) and United States(US).

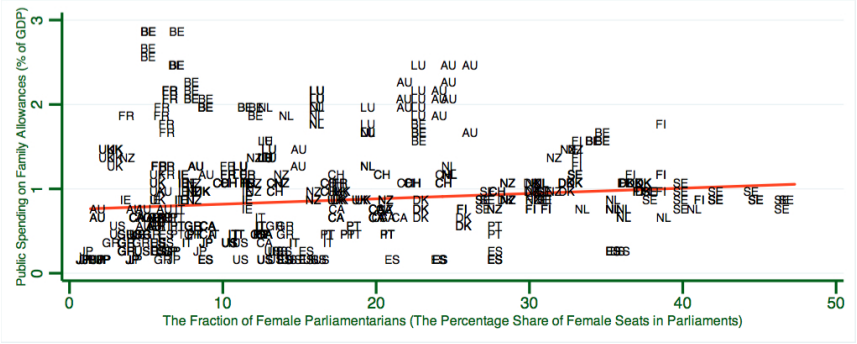


Figure 16: Percentage Share of Female Parliamentarians and Public Spending on Family Allowances (% of GDP)

C and Panel F use a sample which covers the same countries with the second sample where the main regressand of interest is public family allowances as a percentage of total public spending. Panel A, Panel B and Panel C represent results on the relationship between family allowances and the fraction of female parliamentarians without any control variables. Panel C, Panel D and Panel E add other covariates following the suggestions of previous literature. Considering the econometric specifications without control variables, the coefficient for the fraction of female parliamentarians is significant in pooled-OLS estimations for each sample which do not take into account country-specific dummies. Only the entire estimations using the first sample gives significant coefficient estimates but the results are not robust to estimates of same frameworks using other samples. It is an interesting finding that the positive association between the female political participation and family allowances is supported with some estimation frameworks which have used the first sample that covers traditional OECD countries. Traditional OECD countries are for long, at the top of the list of an established rank order of countries according to the level of female parliamentary representation, and their high level female parliamentary representation may translate into larger amount of spending compare to countries having joined the OECD recently. This finding raises a doubt on the fact that the contribution of female politi-

cians to an increase of policy responsiveness to womens preferences may occur only when the percentage share of elected female politicians exceed a remarkable value or a critical mass threshold. Next section empirically discusses on the critical mass threshold argument.

4.4.2 The Relationship Between Female Critical Mass in Parliaments and Public Spending on Family Allowances

In this section, I investigate whether the relationship between the percentage share of female parliamentarians and political choices is not linear. In fact, it is possible that the roles of women start to be relevant in terms of bargaining power only when the percentage share of female parliamentarians reach a given threshold.

The threshold values where women's representation starts to be relevant for the major changes in public policy priorities have been variously identified as 15, 20, 25 or 30 percent (BCM07; SM02). Following previous research, I identify four different thresholds equal to 15, 20, 25 and 30 which represent the percentage of female seats over total parliamentary seats. Each threshold is represented as a dummy variable, which takes value equal to 1 when the share of female seats exceeds the threshold itself. Overall findings show that a positive relationship between female parliamentary representation and public spending on family allowances exists only when the highest threshold is reached and this result is highly robust to different econometric techniques, to estimation in various different samples and to the inclusion of different sets of covariates.

The time series-cross section data model has the following framework to analyze the role of female critical mass in parliamentary representation on public family allowances;

$$y_{it} = \alpha th_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{4.27}$$

As in the previous model, y_{it} denotes public spending on family allowances as a percentage of GDP for the first two samples. For the third sample it represents public spending on family allowances as a percent-

age of total government spending of country i in period t. The main independent variables of interest is th_{it} here represent four different dummy variables which take value equal to 1 when the share of female seats exceeds 15, 20, 25 and 30 per cent critical mass thresholds respectively. The rest of the model specifications including control variables is identitical with the equation (4.25) and the equation (4.26). After the estimations of Pooled-OLS (excluding country dummies and country specific trends) and the fixed effect models using the equation 4.27, further the lagged value,$y_{i,t-1}$ of the regressand is included on the right-hand side to capture persistence and also potentially mean-reverting dynamics in public spending on family allowances and make analysis in a dynamic panel data setting.

$$y_{it} = \delta y_{it-1} + \alpha th_{it} + \mathbf{x}_{it}\beta + \gamma_i + \mu_t + \upsilon_{it} \tag{4.28}$$

Table 13, columns (1) show the pooled OLS estimations on the relationship between the 30% critical mass threshold and public spending on family allowances based on three different samples which are shown at Panel A, Panel B and Panel C. The pooled OLS is identical to equation (4.27) except inclusion of the fixed effects, γ_i's. In my framework, these country dummies capture any time-invariant country characteristics that affect the public spending on family allowances. As it is well known, when the true model is given by (4.27) and the γ_i's are correlated with covariates, then pooled OLS estimates are biased and inconsistent. More specifically, let x_{it}^{j} denote jth component of the vector $\mathbf{x}_{it}$ and let Cov denote population covariances. $Cov(y_{it-1}, \gamma_i + \upsilon_{it}) \neq 0$ or $Cov(x_{it}^{\mathrm{j}}, \gamma_i + \upsilon_{it}) \neq 0$ for some j, the OLS estimator will be inconsistent. In contrast even these covariances are nonzero, the fixed effects estimator will be consistent if $Cov(y_{it-1}, \upsilon_{it}) = Cov(x_{it}^{\mathrm{j}}, \upsilon_{it} = 0$ for all j (as $T \to \infty$). This structure of correlation is particularly relevant in the context of the relationship between the fraction of female parliamentarians and public spending on family allowances because of the possibility of underlying political and social forces shaping both equilibrium of the female empowerment and the governmental resource allocation.

Once fixed effects are introduced to capture any time-invariant country characteristics, the positive relationship between the female political representation over the 30% critical mass threshold and the public spending on family allowances remained unchanged. The estimates of α are 0.2324, 0.16 and 0.3236 with standard errors 0.066, 0.0255, 0.0831 for the first, second and third samples respectively. They are significant at the one percent level where all the standard errors are robust to arbitrary heteroscedasticity. Moreover, the result with the fixed effect estimation technique on positive significant relationship is robust to the inclusion of other additional covariates as seen in columns (5) and (6) in Table-13. Following the main literature on the determinants of family-friendly public spending, these additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old (and below 15 years old) to take into account general economic, labor market situation and demographic development do not change the general finding on the the positive relationship between female political representation over the 30% critical mass threshold and the public spending on family allowances. As an extension to these control variables in columns(5) used by previous literature, columns (6) include two more control variables which are the female labor force participation rate and the female educational attainment. These variables are included to analysis to control general social development. The fixed effect estimates of αs remain significantly positive in this case as well.

On the other hand, in simple dynamic panel models as equation(4.28) where the lagged dependent variable is one of the regressors, it is well known that the usual fixed effects estimator is inconsistent when the time span is small (Nickell, 1981). Because the regressor y_{it-1} is mechanically correlated with υ_{is} for $s < t$,the standard fixed-effect estimation is not consistent in panels with a short time dimension. To deal with this problem the generalized method of moments estimator (GMM) developed by (AB91) is used in columns (3), (7) and (8) of Table 13. Findings on the positive significance of the 30% critical mass threshold is still robust to any sample and the controls that are used under GMM estimation framework as well.

Furthermore, when the true model is given by (4.28), both OLS and fixed effect standard errors might be wrong and the coefficients might be inefficient if the errors show panel heteroskedasticity and they are contemporaneously or serially correlated. Serial correlation, which refers to the linear dynamics of a random variable and biases standard errors causing less efficient results in time-series cross sectional data models. The economic variables tend to evolve parsimoniously over time and that creates temporal dependence. This dependence can be a violation of one of the classical assumptions of the Gauss-markov theorem. The Wooldridge test I applied implies the existence of an arbitrary serial correlation and the null hyphothesis of no serial correlation is strongly rejected (Woo02). To control for contemporaneous correlation, panel-corrected standard errors are reported in columns (4) and columns (9) of Table 13 which include autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Irrespective of the sample type at Panel A, B or C, results on the positive relationship between the 30% critical mass threshold and the public spending on family allowances are strongly valid under these estimation technique as well. On the other hand, all standard errors are robust for the arbitrary heteroscedasticity.

All regressions except Pooled-OLS also use country specific time trends to capture the effects of omitted factors that vary over time within countries. The country-specific linear time trend helps capture the impact of slow-moving changes (including unobserved policy changes) occuring in a specific country throughout the period of analysis. Columns from (5) to (9) of Table 13 investigate the influence of various covariates on the relationship between the 30% critical mass threshold and public spending on family allowances. In each case, I present both fixed effects, GMM and panel corrected standard error estimates. The results show that these covariates do not affect the positive relationship between female political representation over the 30% critical mass threshold and the public spending on family allowances. Estimations based on the first sample and the third sample, represented at Panel A and Panel C, show that public and mandatory private spending on old-age benefits is significant in the spec-

ifications of both GMM and PCSE but it is insignificant for all models except PCSE when estimations are done based on the second sample (Panel B, Columns (9)).

As expected, lagged values of the family allowances are positively and strongly related to the public spending on family allowances. Estimations based on the first and the second sample give mixed results for the log value of GDP per capita but it is positively significant in all regression estimations of the third sample (Panel C) where the main outcome of interest is public spending on family allowances as a percentage of total government spending. For these sample estimates, the significance is valid irrespective of using any different econometric specification and additional control variables. The positive significance might support the Wagners Law which claims that an increase in the average income would raise the share of government spending in GDP. Similarly, female labor market participation has a negative relationship with public spending on family allowances as a percentage of total government expenditures once women's earnings are considered as an additional income which families rely on. Increasing number of women in labor market increase the income level of households which causes a decrease in family allowances allocated to households with respect to their new income level. Some unemployment rate coefficients also give expectedly positive signs with GMM estimations in the third sample at Panel C of Table 13. One possible interpretation for this result is that family allowances is a good practice in anti-poverty family policies which are designed to support families for the costs of raising children.

Overall results support Dahlerup (1988)' argument on critical mass which states that *"The idea of a critical mass is most often applied to situations when women constitute less than 30 percent, in this way explaining why the entrance of women into politics has not made more difference yet!"*. The positive cross-sectional relationship between the fraction of female parliamentarians and family allowances exists when a certain threshold (30%) is passed. This result is highly robust to different econometric techniques from fixed effects to Arellano-Bond GMM estimation, to estimations in various different samples and to the inclusion of different sets of

covariates. On the contrary, I have not found any significant effect for the other dummy variables associated to the lower thresholds as 15%, 20%, 25% (Tables 14-16). Correspondingly, UN CEDAW's (The Committee on the Elimination of Discrimination against Women) General Recommendation on Article 7 of the Convention also agreed on 30 percent as the figure for female political representation to have a real impact on political style and the content of policy decisions (CEDAW 1997, para.16). All the critical mass thresholds which are determined under the 30% critical mass threshold show a significant coefficient estimates using pooled OLS estimation technique (Columns (1) of Tables (14-16)). The positive relationship between the threshold levels under the 30% and the public spending on family allowances disappears once the country fixed effects are included except the third sample of Table 16 which is not robust to inclusion of other covariates, to different samples and superior models. Table 14 represents estimates, using three different samples, where the common interest is to analyze the relationship between the 15% critical mass threshold and the public spending on family allowances. The coefficient of the 15% threshold is significant only under pooled OLS estimations (columns(1)). Once county dummies are included to get rid of omitted variable bias which is caused by the time-invariant country specific characteristics, the significance disappears. Table 15 (Table 16) represents results from regression estimations on the relationship between the 20% (the 25%) critical mass threshold and public spending on family allowances respectively. In line with the previous results of the 15% critical mass threshold, the fraction of female parliamentarians over the 20% or the 25% critical mass thresholds are also positively significant in the the Pooled-OLS estimation framework. Once country fixed effects and additional covariates are included, positive significance of both critical mass thresholds disappear. There is no robust relationship between any critical mass threshold level under the 30% female political representation and the public spending on family allowances with the inclusion of the fixed effects.

Therefore, it might be a possible answer for the absence of a correlation between the fraction of female parliamentarians and family al-

lowances, since the average percentage of female seats in OECD parliaments has not peaked at the 30% critical mass threshold level over the last fourty years. In other words, the higher percentages of women across OECD countries might be required in order to be effective in the policy-making at some social policy areas which represent women's interests. The small raises in the number of elected female politicians over years might not be enough to observe policy changes, which probably require stronger changes in female political participation. Although there is an increasing trend in the number of female politicians across OECD countries, the average women share in parliaments of OECD-34 is still less than one-third by 2012.

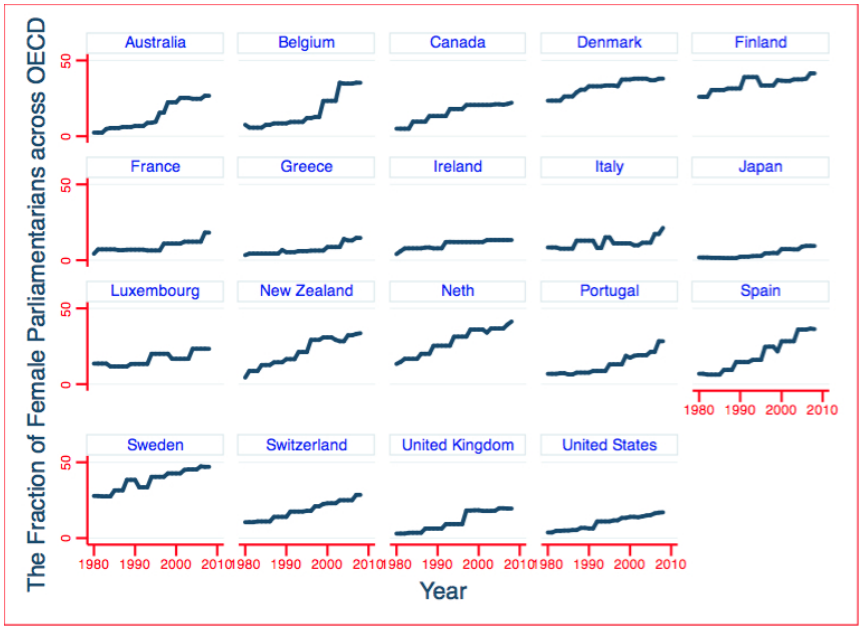


Figure 17: The Fraction of Female Parliamentarians across OECD between 1980-2008

Figure 17 represents the average fraction of female parliamentarians in every ten years from 1980 to 2008. Although those countries have showed up with significant increases since 1980, the average percentage

share of the female seats still under the 30% of overall seats in OECD.

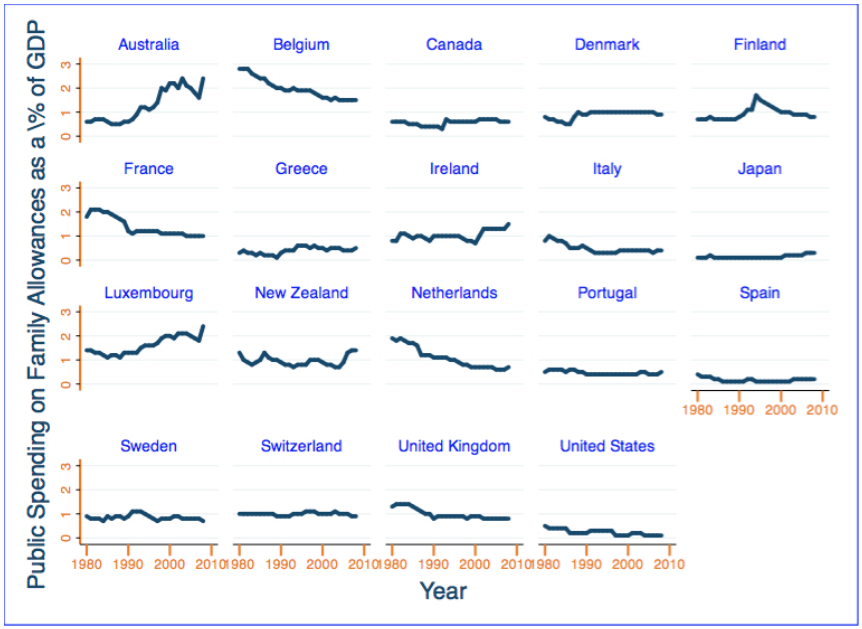


Figure 18: Public Spending on Family Allowances as a % of GDP across OECD between 1980-2008

On the other hand, despite to an increasing trend in the fraction of female parliamentarians, public spending on family allowances (% of GDP) does not have a continuous increasing trend in most of the OECD countries (Figure 18). As emphasized before in previous chapters, the highest propotion of the total social expenditures belongs to old age benefits and health expenditures in overall social welfare expenditures across OECD countries.

4.5 Empirical Robustness

Based on the first sample, Table 17 investigates the robustness of the main results on the positive significance of the 30% critical mass threshold on

family allowances. Table 18 and Table 19 replicate the same estimations using other two samples. Each panel of the Table 17 investigates the influence of different covariates on the relationship between the 30% critical mass threshold and the public spending on family allowances. Panel A to Panel E in Table 17 add voter turnout in election, cabinet composition[13], electoral fractionalization of the party-system[14], legislative fractionalization of the party-system[15] and constitutional structures as additional covariates respectively. Panel A to Panel D at Table 18 and Table 19 check robustness using the voter turnout in election, cabinet composition, electoral fractionalization and legislative fractionalization respectively. Due to the unavailability of data on constitutional structures for the countries which have recently joined to OECD, robustness checks using the second and the third sample do not include these variables. It is important to note that some of those control variables may be potentially endogeneous.However, estimations which are done excluding those variables has not created any change for the positive relationship between the 30% threshold level on the family allowances.

4.5.1 Does voter turnout matter?

Scholars have formarly stressed on the public policy impacts of voter turnout. They have mostly pointed out its positive impact on public so-

[13]Cabinet composition (Schmidt-Index): takes value 1 if hegemony of right-wing (and centre) parties (social-democratic and other left parties in percentage of total cabinet posts is 0), takes value 2 if dominance of right-wing (and centre) parties (social-democratic and other left parties in percentage of total cabinet posts¡33.3%), takes value 3 if balance of power between left and right (social-democratic and other left parties in percentage of total cabinet posts is between 33.3% and 66.6%), takes value 4 if dominance of social-democratic and other left parties (social-democratic and other left parties in percentage of total cabinet posts¿66.6%), takes value 5 if hegemony of social-democratic and other left parties (social-democratic and other left parties in percentage of total cabinet posts is 100%).

[14]Index of electoral fractionalization of the party-system according to the formula $(1 - \sum_{i=1}^{m} (v_i)^2$ where v_i is the share of votes for party i and m is the number of parties) proposed by (Rae68).

[15]Index of legislative fractionalization of the party-system according to the formula $(1 - \sum_{i=1}^{m} (s_i)^2$ where s_i is the share of seats for party i and m is the number of parties) proposed by (Rae68).

cial welfare spending, because it is possible that the entrance of the new and lower status voters into politics create a pressure on governments to spend more on social welfare sectors. For instance, (Dye79), (HS92), (Lin96) claim on an increasing effectiveness of voter turnout on welfare spending. However the disparity in turnout between low and high-income voters are important for the shape of governmental spending. If huge disparities exist in countries across income levels or the number of lower income voters are less than high or middle income voters in electoral participation, less governmental spending on welfare services can be expected. For instance (TV10) have emphasized that the middle class prefers low taxes by a center-right party for fear that a left-wing party would use high taxes to redistribute to the poor. Therefore it is expected to have low taxes and less targeted transfers to narrow groups when the number of low income class fewer than middle or high income class. For instance (WRRS80) have claimed that the reason behind the poor governmental spending in America is essentially voter turnout, since lower income earners in America are less likely to vote than people with high level incomes.

Panels A of Table 17-19 represent estimates controlling voter turnout variable. Column(1-2) of Panels A show the fixed effect and GMM estimation results where the only control variable is voter turnout itself. Columns(3) and Columns(4) of Panel A in Table 17-19 add other control variables such as real GDP per capita, unemployment rate, the population rate of the citizens above 65 years old and below 15 years old, the female labor force participation rate and the female educational attainment for 15-44 year old women to take into account the economic, labor market and demographic situation and as well as the social development. Columns (4) show Prais-Winsten (AR(1)) regression estimates. Throughout, country specific time trends, country and year fixed effects are controlled in all regressions and all standard errors are robust for the arbitrary heteroscedasticity. The estimations based on three different samples reveal that voter turnout does not change the positive significance of the female political participation over the 30% critical mass threshold on family allowances.The coefficient of the female political participation over the

30% critical mass threshold is still highly significant. The voter turnout variable itself is insignificant when the first sample is used for the analysis. However it gives some negative significant results when the second and the third samples are considered. Family allowances are the kind of policies target mainly poor households. The countries with available data on family allowances are mainly developed countries of OECD area. Therefore, it is not surprising to obtain negative coefficient estimates for the voter turnout variable, since the number of high income voters are more than the number of less income voters. In other words, there can be a crowding out effect of the other public policies which are prefered by middle and high income groups.

4.5.2 Does cabinet composition matters?

The effect of the ideological cabinet composition on social welfare expenditures has been largely analyzed in the prior literature. The findings of the prior research on the relationship between ideological composition and public social spending have so far been elusive. For instance, (Sol83), (Ive01), (KO03) have found no evidence or at least weak association between the ideological composition and social welfare spending. On the contrary, (HS92) has indicated that the leftist governments allocate more on the welfare policies than the right wing governments. (Cus97) similarly have emphasized on the role of leftist governments in high amounts of welfare spending.(HRS93) also has mentioned on the role of ideology in social welfare spending by showing the differences between christian democrat and social democrat governments in public transfers. Despite these diverging results, since ideology and the public policy correlation has been largely taken into consideration by former research, I apply a robustness check by adding an index for government party composition to the equation (2).

Panels B at Tables 17-19 represent estimates using government party composition as an additional covariate. Using different econometric specifications from fixed effects to Arellano-Bond GMM estimations in different samples, the positive significance of the 30% critical mass threshold on

family allowances has remained unchanged. Cabinet composition itself is significant only in the PCSE specification of the second sample which include additional covariates (Column (4) at Panel B of Table 18).

4.5.3 Does electoral fractionalization matter?

Electoral fractionalization shows the degree to which political parties in a parliament share the votes in a more equitable way. In most of the countries in the world, two big main parties usually share the votes after an election. (Lip77) and (MM86) pointed out that the larger number of political parties in a parliament might decrease efficiency of public spending since multiparty parliaments might make more promises to different interest groups which can be resulted with less effective reallocation of public expenditures. Econometric specifications at Panels C of Table 17-19 control for the electoral fractionalization to check the robustness of the positive relationship between the 30% critical mass threshold and public spending on family allowances. All results support the positive significance of the 30% critical mass threshold after controlling for the electoral fractionalization as well. Electoral fractionalization itself has a negative sign only in the PCSE estimations which are done based on the second and the third samples (Table 17, Panel C, Column (1)). The same econometric specification gives positive coefficient estimates using the second and the third samples(Table 18 and Table 19, Panels A, Columns (4)). However both results are not robust to using GMM and FE techniques. Therefore it is difficult to make an interpretation on the relationship between the electoral fractionalization and public spending on family allowances.

4.5.4 Does legislative fractionalization matter?

Legislative fractionalization is defined as ”the probability that any two members of the parliament picked at random from the legislature will be from different parties. This is a measure of the division within parliament which has substantial influence over the budget”. A higher legislative fractionalization indicates a larger number of small parties occupy-

ing legislative seats. The public finance literature has recently discussed that legislative fractionalization might affect the level of public spending. (PT04) indicate that since majoritarian parliamentary systems are more likely to produce single party majority governments, whereas coalition and minority governments become more likely under proportional elections, majoritarian elections lead to smaller welfare programs than proportional elections. Similarly (RS89) explain the higher amount of public spending with high level of legislative fractionalization and show the presence of many political parties in a ruling coalition as the reason of larger budget deficits. On the other hand, (BR06) find no effect of a greater number of parties in the legislature on public spending. In line, (VDH01) and (PK02) find some effects that are only marginally significant or not robust to different estimation frameworks.

In my regression estimates, legislative fractionalization itself does not show any significant relevance on public family allowances (Table 17-19). On the other hand, controlling legislative fractionalization does not change the positive significance of the 30% critical mass threshold on family allowances. Similar to the previous robustness checks using the electoral fractionalization, voter turnout and cabinet composition, legislative fractionalization also does not invalidate the main result.

4.5.5 Do constitutional structures matter?

The constitutional structure index is established by (AWE$^+$12), based on a paper written by (HRS93) . The index is augumented and includes five different indicators as *Federalism* (absence federalism, weak federalism, strong federalism), *Government Form* (presidential,parliamentary or other), *Electoral syestems* (proportional, modified proportional representation, majoritarian), *Bicameralism* (no second chamber, weak bicameralism, strong bicameralism) and *Frequent Referenda*.

Prior empirical research mostly pointed out the fact that federal countries spend less on social sectors compare to unitary countries(Cam78; Swa02; Cas99; HRS93). Furthermore the effect of government form (parliamentary, presidential or other) on public expenditures also has been in-

vestigated by existing research. (PT99) has emphasized that public good supply of parliamentary regimes are smaller than the presidental regimes since politicians are instigated to assign benefits for a larger number of voters. Moreover, electoral systems have also been examined as one of the determinants of government spending so far. (PRT07) have presented a theoretical model where electoral rules form the equilibrium number of parties and thus have an indirect effect on the government expenditure allocation. The empirical predictions of their model have indicated that proportional elections are associated with the higher government spending than majoritarian elections.

The prior literature have also mentioned on the role of bicameralism and the frequent referanda in budgetary outcomes[16]. Bicameral legislatures[17] are those whose considerations and debates involve two distinct assemblies. Depending on the relative balance of power between two assemblies, preferences and interests expressed in two legislative bodies might differ and a conflict over the legislative outcome which might arise between the two assemblies. If both of them have common interests, bicameralism produces a legislative outcome that makes both assemblies better off. On the contrary, legislative outcomes closer to the interest of one assembly make the other worse off(TM97). Consequently, there has been a huge debate on the effect of bicameralism on public policy outcomes and the empirical studies which examine the impact of bicameralism have so far indicated diverging results. (Tul59) has pointed out a problem which can occur in fiscal policies since the chambers have different electoral bases. Chambers can blockthe each other's decisions while both of them trying to reach a different agreement on budgetary allocations that might lead to less amount of public spending. Similarly, (BC01) have emphasized on the asymmetric bargaining powers of the chambers in which the chamber has weaker power might have smaller impact on policy outcomes than the other chamber has relatively strong power.

[16]For the relavant literature on referendums and government expenditures see: (Meg83; Far90; FM03)

[17]Bicameral legislatures roughly got their popularity in 18th and 19th centuries although the 14th century of English parliament was one of the first examples of bicameral legislatures.

Therefore, the effect of an additional legislator on public expenditures would be smaller in bicameral structure than in unicameral structure. In contraast, (Hel97) has claimed that the new individuals participating to the second chamber reflect different number of interests which therefore leads to higher governmental spending.

To control for constitutional structure does not change the positive relationship between the female political representation over the 30% critical mass threshold and the public spending on family allowances. Due to the data unavailability of this index for some countries which have recently joined to OECD,the robustness checks with this variable could not be analyzed using the the second and the third samples.

Table 12: The Percentage Share of Female Parliamentarians and Public Spending on Family Allowances across OECD Countries

	Panel-A			Panel-B			Panel-C		
	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Percentage of Female Parliamentarians	0.0089***	0.0127*	0.0062**	0.0147***	0.0127	0.0155	0.0176***	0.0351	0.0130
	(0.0017)	(0.0070)	(0.0031)	(0.0022)	(0.0093)	(0.0099)	(0.0054)	(0.0251)	(0.0207)
(Lag) Public Spending on Family Allowances			0.7110***			0.4023***			0.4886***
			(0.0534)			(0.0462)			(0.0704)
R-Square	0.0360	0.7666		0.0796	0.6183		0.0188	0.5710	
Number of Cases	551	551	494	378	378	297	364	364	286
	Panel-D			Panel-E			Panel-F		
	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB	Pooled-OLS	FE	AB
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Percentage of Female Parliamentarians	0.0085***	0.0095	0.0055*	0.0090***	0.0113	0.0147	0.0023	0.0339	0.0180
	(0.0023)	(0.0074)	(0.0030)	(0.0035)	(0.0090)	(0.0094)	(0.0087)	(0.0242)	(0.0188)
Population rate (above 65 years old)	7.8101***	-5.5704	-3.1623	-7.8168***	-3.6853	-4.6416	-18.1912***	-9.8695	-15.2043*
	(1.5681)	(3.3169)	(1.9748)	(1.3077)	(5.1412)	(4.6581)	(3.4036)	(12.9277)	(8.4061)
Population rate (under 15 years old)	9.4977***	0.4025	-0.6934	0.0093	0.0043	-0.2325	0.0247	0.5254	1.7985
	(1.0131)	(2.9943)	(1.3093)	(0.0098)	(0.5933)	(1.1841)	(0.0219)	(1.4310)	(2.0726)
Total Old-Age Benefits(%GDP)	-0.0011	-0.0328	-0.0350**	-0.0242*	-0.0126	-0.0154	-0.0167	-0.0403	-0.0690**
	(0.0099)	(0.0283)	(0.0144)	(0.0129)	(0.0172)	(0.0176)	(0.0286)	(0.0323)	(0.0328)
Unemployment Rate	0.0130	0.0043	-0.0033	0.0185	0.0028	0.0180*	0.0361	0.0150	0.0279***
	(0.0087)	(0.0124)	(0.0069)	(0.0118)	(0.0106)	(0.0093)	(0.0260)	(0.0208)	(0.0106)
Log(GDP per capita)	1.3506***	-0.6713	-0.1055	0.8376***	0.1396	1.1538***	2.1949***	2.6899***	4.4270***
	(0.1006)	(0.4370)	(0.2016)	(0.1154)	(0.3627)	(0.4376)	(0.2757)	(0.8758)	(0.8784)
Female Labor Force Participation Rate	-0.0029	0.0100	0.0030	0.0041	-0.0259*	-0.0217*	0.0148	-0.0664*	-0.0462**
	(0.0026)	(0.0107)	(0.0045)	(0.0047)	(0.0132)	(0.0131)	(0.0107)	(0.0343)	(0.0193)
Female Educational Attainment	-0.0919***	0.2436	0.1214	-0.1381***	-0.1413	-0.0922	-0.3626***	-0.4736	0.1039
	(0.0184)	(0.2701)	(0.1479)	(0.0248)	(0.1359)	(0.1637)	(0.0618)	(0.4086)	(0.4403)
(Lag) Public Spending on Family Allowances			0.6771***			0.3827***			0.4434***
			(0.0498)			(0.0530)			(0.0655)
R-Square	0.2646	0.7899		0.2788	0.6344		0.2821	0.5985	
Number of Cases	551	551	494	378	378	297	364	364	286

The pooled cross-sectional OLS estimates are shown in columns 1. The fixed effects estimation results are represented in columns 2 with country dummies. Columns 3 use the GMM of Manuel Arellano and Stephen R. Bond (1991) with robust standard errors which instrument for the female parliamentary representation using a double lag. Estimation frameworks in Panel A,B and C do not control any variable. Panel D,E and F add additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old, female labor force participation rate and female educational attainment for 15-44 year old women to take into account general economic, labor market situation, demographic and social development. Year dummies are included in all regressions. All regressions include country dummies except the pooled cross-sectional OLS estimations. The main independent variable (female parliamentary representation) is the percentage share of female seats in lower chambers across OECD parliaments. Panel A uses a yearly balanced panel dataset from 1980 to 2008 where the public spending on family allowances as a percentage of GDP is the main regressand. Panel B uses the same annual data from 1995 to 2008 including other countries for which necessary data is not available for the previous years. Panel C uses the same sample in Panel B and represents estimation results which consider the public spending on family allowances as a percentage of total govenment spending as the main regressand. One, two and three * indicate significance at the 10, 5 and 1% level respectively. All standard errors are robust for the arbitrary heteroscedasticity. Total Old-Age Benefits (%GDP) refers to public and mandatory private spending on old-age benefits as a percentage of GDP.

Table 13: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances

	Pooled-OLS	FE	AB	PCSE	FE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PANEL A									
Threshold-30	0.0905**	0.2324***	0.0938**	0.1557***	0.2342***	0.2202***	0.0914***	0.0878***	0.1466***
	(0.0433)	(0.0666)	(0.0369)	(0.0344)	(0.0639)	(0.0649)	(0.0325)	(0.0326)	(0.0326)
Lag(Family Allowances)			0.6951***	0.3042***			0.6597***	0.6570***	0.2735***
			(0.0483)	(0.0416)			(0.0451)	(0.0416)	(0.0394)
Population rate (above 65)					-2.9085	-3.3633	-2.3954	-2.3147	-2.4424
					(3.5364)	(3.2378)	(1.9522)	(1.8273)	(1.8396)
Population rate (under 15)					0.7809	0.6214	-0.5627	-0.5740	0.9065
					(2.3761)	(2.5208)	(1.1386)	(1.1467)	(0.9941)
Total Old-Age Benefits (%GDP)					-0.0324	-0.0308	-0.0351***	-0.0346**	-0.0285**
					(0.0256)	(0.0276)	(0.0123)	(0.0138)	(0.0128)
Unemployment Rate					0.0086	0.0077	-0.0024	-0.0030	0.0041
					(0.0123)	(0.0117)	(0.0066)	(0.0063)	(0.0040)
Log(GDP per capita)					-0.5268	-0.5689	-0.1239	-0.1321	-0.3079*
					(0.3774)	(0.4006)	(0.2028)	(0.1876)	(0.1728)
FLFP						0.0035		0.0014	0.0043
						(0.0096)		(0.0042)	(0.0046)
Female education						0.1881		0.1277	0.1345
						(0.2494)		(0.1449)	(0.1042)
R-Square	0.0144	0.7778		0.9452	0.7999	0.8010			0.9471
Number of Cases	551	551	494	550	551	551	494	494	550
PANEL B									
Threshold-30	0.1714***	0.1600***	0.1660***	0.1298***	0.1594***	0.1589***	0.1401***	0.1399***	0.1223**
	(0.0529)	(0.0255)	(0.0358)	(0.0446)	(0.0361)	(0.0310)	(0.0396)	(0.0401)	(0.0504)
Lag(Family Allowances)			0.4018***	0.1495***			0.4153***	0.3919***	0.1510***
			(0.0257)	(0.0527)			(0.0230)	(0.0309)	(0.0506)
Population rate (above 65)					0.1974	-0.7751	-5.1652	-4.7919	-1.4248
					(5.2623)	(4.7253)	(3.9390)	(3.4854)	(2.4118)
Population rate (under 15)					0.1091	0.4422	0.8149	0.9142	0.1274
					(0.5228)	(0.5897)	(1.1499)	(1.1054)	(0.4370)
Total Old-Age Benefits (%GDP)					-0.0217	-0.0154	-0.0277	-0.0221	-0.0181*
					(0.0205)	(0.0190)	(0.0188)	(0.0199)	(0.0095)
Unemployment Rate					-0.0051	-0.0000	0.0103	0.0132**	0.0014
					(0.0125)	(0.0107)	(0.0067)	(0.0063)	(0.0051)
Log(GDP per capita)					-0.1656	0.0898	0.9990***	1.0698***	0.2562
					(0.2518)	(0.2744)	(0.3625)	(0.3488)	(0.3064)
FLFP						-0.0273*		-0.0163	-0.0216***
						(0.0139)		(0.0126)	(0.0062)
Female education						-0.1419		-0.0217	-0.1278
						(0.1411)		(0.1670)	(0.1790)
R-Square	0.0220	0.6189		0.9688	0.6224	0.6357			0.9702
Number of Cases	378	378	297	377	378	378	297	297	377
PANEL C									
Threshold-30	-0.0434	0.3236***	0.2741**	0.2407**	0.3498***	0.3453***	0.3126*	0.3190*	0.2459**
	(0.1258)	(0.0831)	(0.1345)	(0.0956)	(0.1220)	(0.1100)	(0.1613)	(0.1635)	(0.1100)
Lag(Family Allowances)			0.4742***	0.0985**			0.4523***	0.4321***	0.1158***
			(0.0542)	(0.0462)			(0.0440)	(0.0385)	(0.0435)
Population rate (above 65)					-1.8965	-4.3171	-12.0685	-10.9883	-5.9324
					(12.2389)	(12.1523)	(8.1553)	(7.4311)	(5.3226)
Population rate (under 15)					0.6006	1.4352	4.0887	4.2439	0.6932
					(1.1791)	(1.4231)	(2.7923)	(2.6876)	(1.0663)
Total Old-Age Benefits(%GDP)					-0.0643	-0.0483	-0.0805***	-0.0726**	-0.0497**
					(0.0425)	(0.0388)	(0.0306)	(0.0321)	(0.0242)
Unemployment Rate					-0.0052	0.0079	0.0177**	0.0239**	0.0134
					(0.0256)	(0.0219)	(0.0089)	(0.0103)	(0.0142)
Log(GDP per capita)					1.8844**	2.5017***	4.2015***	4.4777***	2.7556***
					(0.7206)	(0.8376)	(0.8918)	(0.9131)	(0.8818)
FLFP						-0.0703*		-0.0405*	-0.0579***
						(0.0376)		(0.0211)	(0.0135)
Female education						-0.4974		0.1634	-0.4291
						(0.4388)		(0.4250)	(0.4168)
R-Square	0.0011	0.5594		0.9611	0.5709	0.5885			0.9652
Number of Cases	364	364	286	363	364	364	286	286	363

The pooled cross-sectional OLS estimates are shown in columns 1 of each panel. The fixed effects estimation results are shown in columns 2, 5, 6. Columns 3,7 and 8 use the GMM of Manuel Arellano and Stephen R. Bond (1991) which instrument for the 30% female parliamentary representation using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns (4) and columns (9) which include autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Following related literature Columns 5 and 7 add additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old to take into account general economic development, labor market situation and demographic development. In addition to these covariates, columns 6, 8 and 9 add also female labor force participation rate and female educational attainment for 15-44 year old women to take into account social development. Year dummies are included in all regressions. Except the pooled cross-sectional OLS regression, all estimations include country dummies and country specific time trends. The main independent variable (Threshold-30) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 30%. Panel A uses a yearly balanced panel data from 19802008 where the public spending on family allowances as a percentage of GDP is the main regressand. Panel B uses the same annual data from 1995 to 2008 including other countries for which the necesssary data is not available for the previous years. Panel C uses the same sample in Panel B where the public spending on family allowances as a percentage of total govenment spending is the main regressand. One, two and three * indicate significance at the 10, 5 and 1% level respectively. Total Old-Age Benefits (%GDP) refers to public and mandatory private spending on old-age benefits as a percentage of GDP. All standard errors are robust for the arbitrary heteroscedasticity. FLFP stands for Female Labor Force Participation Rate.

Table 14: Female Political Representation over the 15% Female Critical Mass Threshold and Public Spending on Family Allowances

	Pooled-OLS	FE	AB	PCSE	FE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PANEL A									
Threshold-15	0.2093***	0.0592	0.0128	0.0346	0.0218	0.0295	-0.0009	-0.0015	0.0209
	(0.0457)	(0.0563)	(0.0289)	(0.0220)	(0.0624)	(0.0620)	(0.0272)	(0.0280)	(0.0235)
Lag(Family Allowances)			0.7209***	0.3294***			0.6902***	0.6843***	0.3041***
			(0.0491)	(0.0409)			(0.0474)	(0.0431)	(0.0390)
Population rate (above 65)					-3.6130	-5.1599	-3.0490*	-3.1061*	-3.3516*
					(3.8626)	(3.1571)	(1.8422)	(1.7185)	(1.8296)
Population rate (under 15)					1.5831	0.8035	-0.4062	-0.5375	1.1020
					(2.9625)	(3.1294)	(1.1619)	(1.1972)	(1.0098)
Total Old-Age Benefits(%GDP)					-0.0339	-0.0349	-0.0356***	-0.0362***	-0.0310**
					(0.0262)	(0.0283)	(0.0122)	(0.0133)	(0.0127)
Unemployment rate					0.0029	0.0025	-0.0046	-0.0051	0.0010
					(0.0132)	(0.0121)	(0.0068)	(0.0064)	(0.0041)
Log(GDP per capita)					-0.6272	-0.7334	-0.1451	-0.1724	-0.3726**
					(0.4289)	(0.4419)	(0.1979)	(0.1810)	(0.1727)
FLFP						0.0122		0.0035	0.0094**
						(0.0108)		(0.0043)	(0.0047)
Female education						0.2942		0.1431	0.1885*
						(0.2627)		(0.1388)	(0.1050)
R-Square	0.0384	0.7591		0.9432	0.7803	0.7854			0.9467
Number of Cases	551	551	494	550	551	551	494	494	550
PANEL B									
Threshold-15	0.3306***	0.0284	-0.0678	-0.0115	0.0263	0.0268	-0.0243	-0.0163	-0.0105
	(0.0576)	(0.0509)	(0.1102)	(0.0213)	(0.0487)	(0.0488)	(0.0973)	(0.0998)	(0.0228)
Lag(Family Allowances)			0.4416***	0.1576***			0.4502***	0.4277***	0.1616***
			(0.0385)	(0.0531)			(0.0411)	(0.0481)	(0.0509)
Population rate (above 65)					-3.9712	-4.8906	-8.5034*	-8.1130*	-4.1440*
					(5.5927)	(5.2166)	(5.0563)	(4.4256)	(2.2365)
Population rate (under 15)					-0.3897	-0.0593	-0.3043	-0.2226	-0.2487
					(0.5373)	(0.6071)	(1.1743)	(1.1209)	(0.4088)
Total Old-Age Benefits(%GDP)					-0.0204	-0.0141	-0.0302	-0.0247	-0.0186*
					(0.0207)	(0.0192)	(0.0227)	(0.0242)	(0.0099)
Unemployment Rate					-0.0030	0.0021	0.0105	0.0135**	0.0024
					(0.0126)	(0.0109)	(0.0070)	(0.0069)	(0.0052)
Log(GDP per capita)					-0.1738	0.0788	0.8863**	0.9648***	0.2269
					(0.2815)	(0.3300)	(0.3689)	(0.3570)	(0.3184)
FLFP						-0.0271*		-0.0156	-0.0210***
						(0.0141)		(0.0138)	(0.0064)
Female education						-0.1636		-0.0285	-0.1525
						(0.1411)		(0.1466)	(0.1879)
R-Square	0.0787	0.6013		0.9672	0.6079	0.6213			0.9693
Number of Cases	378	378	297	377	378	378	297	297	377
PANEL C									
Threshold-15	0.6551***	0.1299	-0.4065	0.0150	0.1485	0.1481	-0.2864	-0.2849	0.0360
	(0.1417)	(0.1380)	(0.3552)	(0.0491)	(0.1332)	(0.1328)	(0.3510)	(0.3467)	(0.0512)
Lag(Family Allowances)			0.4759***	0.0983**			0.4639***	0.4498***	0.1185***
			(0.0517)	(0.0467)			(0.0429)	(0.0418)	(0.0440)
Population rate (above 65)					-12.2343	-14.5408	-18.9292*	-18.5989*	-11.9071**
					(11.8198)	(12.0780)	(10.4325)	(9.8070)	(4.9188)
Population rate (under 15)					-0.5358	0.3182	1.5682	1.7596	-0.0505
					(1.1675)	(1.4205)	(2.4868)	(2.2532)	(1.0329)
Total Old-Age Benefits(%GDP)					-0.0576	-0.0414	-0.0867**	-0.0801*	-0.0477*
					(0.0404)	(0.0367)	(0.0413)	(0.0429)	(0.0250)
Unemployment Rate					0.0010	0.0141	0.0182*	0.0238**	0.0166
					(0.0256)	(0.0220)	(0.0103)	(0.0119)	(0.0141)
Log(GDP per capita)					1.9516**	2.5730**	3.7372***	4.0139***	2.7388***
					(0.8120)	(0.9687)	(0.8781)	(0.9421)	(0.8856)
FLFP						-0.0708*		-0.0364	-0.0574***
						(0.0376)		(0.0231)	(0.0137)
Female education						-0.5109		0.3085	-0.4381
						(0.4608)		(0.4427)	(0.4312)
Constant	1.6653***	1.9279***		4.0778***	-16.2527*	-12.5445			-14.3352
	(0.2330)	(0.1098)		(0.5360)	(8.0689)	(9.4137)			(11.5022)
R-Square	0.0498	0.5484		0.9587	0.5613	0.5792			0.9637
Number of Cases	364	364	286	363	364	364	286	286	363

The pooled cross-sectional OLS estimates are shown in columns 1 of each panel. The fixed effects estimation results are shown in columns 2, 5, 6. Columns 3,7 and 8 use the GMM of Manuel Arellano and Stephen R. Bond (1991) which instrument for the 15% female parliamentary representation using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns (4) and columns (9) which include autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Following related literature Columns 5 and 7 add additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old to take into account general economic development, labor market situation and demographic development. In addition to these covariates, columns 6, 8 and 9 add also female labor force participation rate and female educational attainment for 15-44 year old women to take into account social development. Year dummies are included in all regressions. Except the pooled cross-sectional OLS regression, all estimations include country dummies and country specific time trends. The main independent variable (Threshold-15) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 15%. Panel A uses a yearly balanced panel data from 19802008 where the public spending on family allowances as a percentage of GDP is the main regressand. Panel B uses the same annual data from 1995 to 2008 including other countries for which the necesssary data is not available for the previous years. Panel C uses the same sample in Panel B where the public spending on family allowances as a percentage of total govenment spending is the main regressand. One, two and three * indicate significance at the 10, 5 and 1% level respectively. Total Old-Age Benefits (%GDP) refers to public and mandatory private spending on old-age benefits as a percentage of GDP. All standard errors are robust for the arbitrary heteroscedasticity. FLFP stands for Female Labor Force Participation Rate.

Table 15: Female Political Representation over the 20% Female Critical Mass Threshold and Public Spending on Family Allowances

	Pooled-OLS	FE	AB	PCSE	FE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PANEL A									
Threshold-20	0.2059***	0.0080	-0.0090	-0.0090	-0.0184	-0.0089	-0.0286	-0.0287	-0.0194
	(0.0452)	(0.0830)	(0.0289)	(0.0261)	(0.0818)	(0.0819)	(0.0265)	(0.0262)	(0.0271)
Lag(Family Allowances)			0.7173***	0.3342***			0.6834***	0.6778***	0.3109***
			(0.0453)	(0.0413)			(0.0419)	(0.0381)	(0.0392)
Population rate (above 65)					-3.6457	-5.0801	-3.0448	-3.1020*	-3.2563*
					(3.9627)	(3.2857)	(1.8543)	(1.7062)	(1.8526)
Population rate(under 15)					1.3911	0.6754	-0.4714	-0.5925	0.9583
					(2.9175)	(3.1717)	(1.0719)	(1.1276)	(1.0038)
Total Old-Age Benefits(%GDP)					-0.0374	-0.0379	-0.0390***	-0.0395***	-0.0339***
					(0.0245)	(0.0278)	(0.0111)	(0.0124)	(0.0129)
Unemployment Rate					0.0020	0.0017	-0.0055	-0.0060	0.0002
					(0.0134)	(0.0124)	(0.0065)	(0.0062)	(0.0041)
Log(GDP per capita)					-0.6769	-0.7736	-0.1841	-0.2105	-0.4105**
					(0.4313)	(0.4602)	(0.1843)	(0.1719)	(0.1714)
FLFP						0.0113		0.0036	0.0088*
						(0.0108)		(0.0043)	(0.0046)
Female education						0.2966		0.1422	0.1872*
						(0.2650)		(0.1308)	(0.1057)
R-Square	0.0380	0.7571		0.9434	0.7802	0.7850			0.9476
Number of Cases	551	551	494	550	551	551	494	494	550
PANEL B									
Threshold-20	0.3614***	0.0431	0.0776	0.0487	0.0384	0.0364	0.0649	0.0785	0.0444
	(0.0541)	(0.1048)	(0.0815)	(0.0332)	(0.1080)	(0.1057)	(0.0812)	(0.0811)	(0.0325)
Lag(Family Allowances)			0.4330***	0.1602***			0.4445***	0.4148***	0.1656***
			(0.0493)	(0.0524)			(0.0538)	(0.0608)	(0.0506)
Population rate (above 65)					-4.0635	-4.8568	-8.7556*	-8.1076*	-4.6521**
					(5.6425)	(5.2650)	(5.2136)	(4.6448)	(2.2330)
Population rate (under 15)					-0.3969	-0.0792	-0.4949	-0.4465	-0.2834
					(0.5404)	(0.5967)	(1.1658)	(1.1687)	(0.4125)
Total Old-Age Benefits(%GDP)					-0.0180	-0.0120	-0.0238	-0.0163	-0.0145
					(0.0179)	(0.0168)	(0.0180)	(0.0185)	(0.0094)
Unemployment Rate					-0.0033	0.0016	0.0119	0.0154*	0.0028
					(0.0128)	(0.0112)	(0.0082)	(0.0080)	(0.0051)
Log(GDP per capita)					-0.2122	0.0294	0.9179**	0.9948**	0.2261
					(0.2914)	(0.3108)	(0.4003)	(0.3919)	(0.3169)
FLFP						-0.0263*		-0.0181	-0.0205***
						(0.0130)		(0.0124)	(0.0064)
Female education						-0.1985		-0.0643	-0.1738
						(0.1907)		(0.1646)	(0.1824)
R-Square	0.1062	0.6026		0.9671	0.6088	0.6220			0.9694
Number of Cases	378	378	297	377	378	378	297	297	377
PANEL C									
Threshold-20	0.6801***	0.1403	0.0236	0.1219	0.1367	0.1339	0.0049	0.0145	0.1261
	(0.1359)	(0.2768)	(0.1874)	(0.0855)	(0.2886)	(0.2832)	(0.2108)	(0.2193)	(0.0779)
Lag(Family Allowances)			0.4932***	0.1004**			0.4762***	0.4579***	0.1189***
			(0.0638)	(0.0461)			(0.0567)	(0.0597)	(0.0435)
Population rate (above 65)					-11.8924	-13.7466	-21.6274*	-20.6897**	-12.4718**
					(11.7089)	(12.0153)	(11.0895)	(10.3939)	(5.0215)
Population rate (under 15)					-0.5350	0.2606	1.5782	1.6812	-0.1344
					(1.2211)	(1.4332)	(2.2619)	(2.0451)	(1.0575)
Total Old-Age Benefits(%GDP)					-0.0512	-0.0358	-0.0819**	-0.0738*	-0.0386
					(0.0341)	(0.0318)	(0.0384)	(0.0393)	(0.0244)
Unemployment Rate					-0.0012	0.0115	0.0189**	0.0250***	0.0164
					(0.0259)	(0.0226)	(0.0085)	(0.0097)	(0.0141)
Log(GDP per capita)					1.7563**	2.3281**	3.9378***	4.2057***	2.6533***
					(0.8474)	(0.9804)	(0.8604)	(0.8952)	(0.9023)
FLFP						-0.0674*		-0.0387*	-0.0552***
						(0.0349)		(0.0205)	(0.0137)
Female education						-0.6700		0.1922	-0.5259
						(0.5806)		(0.4534)	(0.4177)
R-Square	0.0637	0.5492		0.9587	0.5608	0.5785			0.9633
Number of Cases	364	364	286	363	364	364	286	286	363

The pooled cross-sectional OLS estimates are shown in columns 1 of each panel. The fixed effects estimation results are shown in columns 2, 5, 6. Columns 3,7 and 8 use the GMM of Manuel Arellano and Stephen R. Bond (1991) which instrument for the 20% female parliamentary representation using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns (4) and columns (9) which include autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Following related literature Columns 5 and 7 add additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old to take into account general economic development, labor market situation and demographic development. In addition to these covariates, columns 6, 8 and 9 add also female labor force participation rate and female educational attainment for 15-44 year old women to take into account social development. Year dummies are included in all regressions. Except the pooled cross-sectional OLS regression, all estimations include country dummies and country specific time trends. The main independent variable (Threshold-20) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 20%. Panel A uses a yearly balanced panel data from 19802008 where the public spending on family allowances as a percentage of GDP is the main regressand. Panel B uses the same annual data from 1995 to 2008 including other countries for which the necesssary data is not available for the previous years. Panel C uses the same sample in Panel B where the public spending on family allowances as a percentage of total govenment spending is the main regressand. One, two and three * indicate significance at the 10, 5 and 1% level respectively. Total Old-Age Benefits (%GDP) refers to public and mandatory private spending on old-age benefits as a percentage of GDP. All standard errors are robust for the arbitrary heteroscedasticity. FLFP stands for Female Labor Force Participation Rate.

Table 16: Female Political Representation over the 25% Female Critical Mass Threshold and Public Spending on Family Allowances

	PooledOLS	FE	ABI	PCSEI	FEII	FEIII	ABII	ABIII	PCSEII
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PANEL A									
Threshold-25	0.1215***	0.0272	-0.0120	0.0096	0.0475	0.0404	-0.0041	-0.0068	0.0192
	(0.0450)	(0.0597)	(0.0402)	(0.0310)	(0.0702)	(0.0605)	(0.0386)	(0.0371)	(0.0309)
Lag(Family Allowances)			0.7237***	0.3320***			0.6918***	0.6861***	0.3046***
			(0.0452)	(0.0413)			(0.0456)	(0.0409)	(0.0392)
Population rate (above 65)					-3.5512	-5.0277	-3.0293	-3.0995*	-3.2719*
					(3.9074)	(3.2379)	(1.8824)	(1.7329)	(1.8511)
Population rate (under 15)					1.5918	0.8023	-0.3762	-0.5090	1.0725
					(2.7439)	(2.9700)	(1.1251)	(1.1798)	(1.0094)
Total Old-Age Benefits (%GDP)					-0.0375	-0.0388	-0.0353***	-0.0357***	-0.0333***
					(0.0265)	(0.0290)	(0.0113)	(0.0126)	(0.0125)
Unemployment Rate					0.0039	0.0032	-0.0045	-0.0051	0.0012
					(0.0132)	(0.0122)	(0.0068)	(0.0064)	(0.0042)
Log(GDP per capita)					-0.6100	-0.7262*	-0.1414	-0.1709	-0.3766**
					(0.3836)	(0.4113)	(0.1950)	(0.1787)	(0.1716)
FLFP						0.0115		0.0037	0.0089*
						(0.0107)		(0.0043)	(0.0046)
Female education						0.2848		0.1463	0.1852*
						(0.2632)		(0.1321)	(0.1043)
R-Square	0.0191	0.7573		0.9432	0.7808	0.7856			0.9468
Number of Cases	551	551	494	550	551	551	494	494	550
PANEL B									
Threshold-25	0.3142***	0.0295	0.0179	0.0260	0.0389	0.0256	0.0431	0.0368	0.0270
	(0.0555)	(0.0235)	(0.0635)	(0.0561)	(0.0261)	(0.0267)	(0.0560)	(0.0523)	(0.0557)
Lag(Family Allowances)			0.4427***	0.1559***			0.4425***	0.4201***	0.1598***
			(0.0416)	(0.0523)			(0.0443)	(0.0511)	(0.0503)
Population rate(above 65)					-3.7852	-4.5905	-8.9747*	-8.3740*	-4.3201*
					(5.6069)	(5.1966)	(4.8826)	(4.2985)	(2.2210)
Population rate (under 15)					-0.3557	-0.0433	-0.2703	-0.2030	-0.2443
					(0.5755)	(0.6353)	(1.1040)	(1.0817)	(0.4138)
Total Old-Age Benefits (%GDP)					-0.0230	-0.0163	-0.0317	-0.0261	-0.0193**
					(0.0234)	(0.0214)	(0.0232)	(0.0241)	(0.0094)
Unemployment Rate					-0.0037	0.0014	0.0101	0.0131*	0.0024
					(0.0130)	(0.0112)	(0.0076)	(0.0070)	(0.0052)
Log(GDP per capita)					-0.1863	0.0523	0.9240**	0.9929***	0.2414
					(0.2801)	(0.3149)	(0.3895)	(0.3683)	(0.3098)
FLFP						-0.0264*		-0.0158	-0.0206***
						(0.0139)		(0.0130)	(0.0065)
Female education						-0.1817		-0.0409	-0.1529
						(0.1481)		(0.1585)	(0.1842)
R-Square	0.0766	0.6009		0.9671	0.6079	0.6209			0.9691
Number of Cases	378	378	297	377	378	378	297	297	377
PANEL C									
Threshold-25	0.4413***	0.4413***	0.4413***	0.0617	0.1286	0.0964	-0.0693	-0.1001	0.0804
	(0.1396)	(0.1396)	(0.1396)	(0.1476)	(0.0808)	(0.0734)	(0.1204)	(0.1499)	(0.1456)
Lag(Family Allowances)				0.1002**			0.4830***	0.4676***	0.1176***
				(0.0462)			(0.0563)	(0.0560)	(0.0434)
Population rate(above 65)					-10.8623	-12.7640	-21.3013*	-20.2773*	-11.6396**
					(11.8780)	(12.0480)	(11.2712)	(10.7781)	(4.8694)
Population rate (under 15)					-0.3941	0.3932	1.4774	1.5590	-0.0246
					(1.3285)	(1.5376)	(2.3579)	(2.1752)	(1.0389)
Total Old-Age Benefits (%GDP)					-0.0686	-0.0517	-0.0795**	-0.0712*	-0.0523**
					(0.0506)	(0.0458)	(0.0352)	(0.0366)	(0.0233)
Unemployment Rate					-0.0023	0.0105	0.0191**	0.0252**	0.0153
					(0.0266)	(0.0229)	(0.0091)	(0.0105)	(0.0143)
Log(GDP per capita)					1.8418**	2.4117**	3.8967***	4.1595***	2.7086***
					(0.7821)	(0.9337)	(0.8703)	(0.9125)	(0.8795)
FLFP						-0.0678*		-0.0392*	-0.0556***
						(0.0370)		(0.0228)	(0.0138)
Female education						-0.6070		0.2293	-0.4702
						(0.4769)		(0.4033)	(0.4292)
R-Square	0.0263	0.0263	0.0263	0.9593	0.5585	0.5758			0.9637
Number of Cases	364	364	364	363	364	364	286	286	363

The pooled cross-sectional OLS estimates are shown in columns 1 of each panel. The fixed effects estimation results are shown in columns 2, 5, 6. Columns 3,7 and 8 use the GMM of Manuel Arellano and Stephen R. Bond (1991) which instrument for the 25% female parliamentary representation using a double lag. To control for contemporaneous correlation, panel-corrected standard errors are reported in columns (4) and columns (9) which include autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. Following related literature Columns 5 and 7 add additional covariates such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old to take into account general economic development, labor market situation and demographic development. In addition to these covariates, columns 6, 8 and 9 add also female labor force participation rate and female educational attainment for 15-44 year old women to take into account social development. Year dummies are included in all regressions. Except the pooled cross-sectional OLS regression, all estimations include country dummies and country specific time trends. The main independent variable (Threshold-25) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 25%. Panel A uses a yearly balanced panel data from 19802008 where the public spending on family allowances as a percentage of GDP is the main regressand. Panel B uses the same annual data from 1995 to 2008 including other countries for which the necesssary data is not available for the previous years. Panel C uses the same sample in Panel B where the public spending on family allowances as a percentage of total govenment spending is the main regressand. One, two and three * indicate significance at the 10, 5 and 1% level respectively. Total Old-Age Benefits (%GDP) refers to public and mandatory private spending on old-age benefits as a percentage of GDP. All standard errors are robust for the arbitrary heteroscedasticity. FLFP stands for Female Labor Force Participation Rate.

Table 17: Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - First Sample

	PANEL A							PANEL B
	FE	AB	AB	PCSE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Threshold-30	0.2306***	0.0939**	0.0879***	0.1464***	0.2464***	0.0945***	0.0894***	0.1540***
	(0.0664)	(0.0370)	(0.0327)	(0.0326)	(0.0663)	(0.0366)	(0.0336)	(0.0340)
Voter Turnout	-0.0025	-0.0006	-0.0004	-0.0013				
	(0.0025)	(0.0010)	(0.0011)	(0.0012)				
Cabinet Composition					-0.0148	-0.0027	-0.0035	-0.0075
					(0.0124)	(0.0035)	(0.0035)	(0.0052)
R-Square	0.7785			0.9474	0.7819			0.9468
Number of Cases	551	494	494	550	550	492	492	549
	PANEL C							PANEL D
Threshold-30	0.2290***	0.0954**	0.0892***	0.1440***	0.2315***	0.0938**	0.0875***	0.1449***
	(0.0626)	(0.0379)	(0.0335)	(0.0326)	(0.0651)	(0.0370)	(0.0325)	(0.0326)
Electoral Fractionalization	-0.0052	0.0015	0.0013	-0.0024				
	(0.0048)	(0.0019)	(0.0016)	(0.0022)				
Legislative Fractionalization					-0.0029	0.0002	0.0000	-0.0021
					(0.0025)	(0.0011)	(0.0010)	(0.0014)
R-Square	0.7798			0.9466	0.7790			0.9476
Number of Cases	551	494	494	550	551	494	494	550
	PANEL E							
Threshold-30	0.2364***	0.0958***	0.0879***	0.1461***				
	(0.0652)	(0.0368)	(0.0327)	(0.0319)				
Constitutional Structures	0.1017***	0.0311**	0.0325*	0.0650**				
	(0.0328)	(0.0155)	(0.0192)	(0.0263)				
R-Square	0.7830			0.9482				
Number of Cases	551	494	494	550				

Panels A, B, C, D and E represent robustness checks for Voter Turnout, Cabinet Composition, Electoral Fractionalization, Legislative Fractionalization and Constitutional Structures respectively. Estimations are done based on the first sample which is a yearly balanced panel data that covers 19 countries from 1980 to 2008 where the public spending on family allowances as a percentage of GDP is the main regressand. The main independent variable (Threshold-30) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 30%. Columns 1 and columns 2 of the each panel show the fixed effect and GMM estimation results which only control for the robustness check variable (For instance Column(1) and column(3) of Panel A only control for the voter turnout variable and Column(1) and column(3) of Panel B only control for the cabinet composition). To take into account general social development, economic, demographic and labor market situation, GMM and PCSE estimation methods in columns(3) and columns(4) of each panel add also other control variables such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old, female labor force participation rate and female educational attainment for 15-44 year old women. Year dummies, country dummies and country specific time trends are included in all regressions. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively.

Table 18: Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - Second Sample

	PANEL A				PANEL B			
	FE	AB	AB	PCSE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Threshold-30	0.1809***	0.1689***	0.1335***	0.1270**	0.1726***	0.1565***	0.1275***	0.1177**
	(0.0267)	(0.0295)	(0.0381)	(0.0502)	(0.0303)	(0.0359)	(0.0438)	(0.0467)
Voter Turnout	-0.0054	-0.0031*	-0.0022	-0.0048***				
	(0.0041)	(0.0017)	(0.0016)	(0.0015)				
Cabinet Composition					-0.0133	0.0026	-0.0025	-0.0101*
					(0.0112)	(0.0110)	(0.0115)	(0.0054)
R-Square	0.5913			0.9703	0.5891			0.9707
Number of Cases	350	275	275	349	349	275	275	348
	PANEL C				PANEL D			
Threshold-30	0.1857***	0.2041***	0.1675***	0.1361***	0.1672***	0.1736***	0.1378***	0.1195**
	(0.0384)	(0.0455)	(0.0457)	(0.0503)	(0.0276)	(0.0371)	(0.0389)	(0.0504)
Electoral Fractionalization	0.0066	0.0081	0.0079	0.0054*				
	(0.0067)	(0.0052)	(0.0056)	(0.0030)				
Legislative Fractionalization					0.0021	0.0033	0.0029	0.0014
					(0.0030)	(0.0024)	(0.0030)	(0.0021)
R-Square	0.5870			0.9701	0.5830			0.9697
Number of Cases	350	275	275	349	350	275	275	349

Panels A, B, C, D represent robustness checks for Voter Turnout, Cabinet Composition, Electoral Fractionalization, Legislative Fractionalization respectively. Estimations are done based on the second sample which is a yearly balanced panel data that covers 27 countries from 1995 to 2008 where the public spending on family allowances as a percentage of GDP is the main regressand. The main independent variable (Threshold-30) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 30%. Columns 1 and columns 2 of the each panel show the fixed effect and GMM estimation results which only control for the robustness check variable (For instance Column(1) and column(3) of Panel A only control for the voter turnout variable and Column(1) and column(3) of Panel B only control for the cabinet composition). To take into account general social development, economic, demographic and labor market situation, GMM and PCSE estimation methods in columns(3) and columns(4) of each panel add also other control variables such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old, female labor force participation rate and female educational attainment for 15-44 year old women. Year dummies, country dummies and country specific time trends are included in all regressions. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively.

Table 19: Robustness Checks: Female Political Representation over the 30% Female Critical Mass Threshold and Public Spending on Family Allowances - Third Sample

	PANEL A				PANEL B			
	FE	AB	AB	PCSE	FE	AB	AB	PCSE
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Threshold-30	0.3782***	0.2936**	0.2928**	0.2540**	0.3549***	0.2687**	0.2870*	0.2284**
	(0.0873)	(0.1188)	(0.1466)	(0.1113)	(0.0980)	(0.1230)	(0.1510)	(0.1043)
Voter Turnout	-0.0142	-0.0051*	-0.0012	-0.0093**				
	(0.0110)	(0.0027)	(0.0020)	(0.0039)				
Cabinet Composition					-0.0337	0.0023	0.0010	-0.0141
					(0.0295)	(0.0245)	(0.0269)	(0.0135)
R-Square	0.5433			0.9649	0.5399			0.9638
Number of Cases	336	264	264	335	335	264	264	334
	PANEL C				PANEL D			
Threshold-30	0.4028***	0.4229**	0.4460**	0.2885**	0.3419***	0.3313**	0.3610**	0.2440**
	(0.1152)	(0.1940)	(0.1988)	(0.1156)	(0.0843)	(0.1492)	(0.1646)	(0.1140)
Electoral Fractionalization	0.0202	0.0203	0.0226	0.0147*				
	(0.0201)	(0.0168)	(0.0165)	(0.0080)				
Legislative Fractionalization					0.0053	0.0095	0.0117	0.0046
					(0.0088)	(0.0077)	(0.0076)	(0.0055)
R-Square	0.5399			0.9644	0.5333			0.9634
Number of Cases	336	264	264	335	336	264	264	335

Panels A, B, C, D represent robustness checks for Voter Turnout, Cabinet Composition, Electoral Fractionalization, Legislative Fractionalization respectively. Estimations are done based on the third sample which is a yearly balanced panel data that covers 26 countries from 1980 to 2008 where public spending on family allowances as a percentage of total government spending is the main regressand.The main independent variable (Threshold-30) is a dummy variable which is the proxy for gender bargaining power. It takes a value equal to 1 when the share of female seats in national parliaments across OECD exceed 30%. Columns 1 and columns 2 of the each panel show the fixed effect and GMM estimation results which only control for the robustness check variable (For instance Column(1) and column(3) of Panel A only control for the voter turnout variable and Column(1) and column(3) of Panel B only control for the cabinet composition). To take into account general social development, economic, demographic and labor market situation, GMM and PCSE estimation methods in columns(3) and columns(4) of each panel add also other control variables such as real GDP per capita, unemployment rate, population rate of the citizens above 65 years old and below 15 years old, female labor force participation rate and female educational attainment for 15-44 year old women. Year dummies, country dummies and country specific time trends are included in all regressions. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively.

Chapter 5

Conclusions

Parliament is the place where a country's policy direction is set. The failure to involve different voices in policy-making may prove the existence of an unequality in political decisions in public policy making. The involvement of citizens in policy-making process comes generally in two forms: a) Direct participation of citizens in government affairs b) Indirect participation through representatives which are elected in elections.

In line with the global trend to democratization, representative democracy and direct participation in policy-making has gained increasing significance in the political arena. It has also highly emphasized that such representation must cover diverse groups irrespective of race, class, and gender. Among these categories, in recent decades, the question of female political representation has emerged as a global issue all over the world. The under-representation of women in politics still persist even in the most advanced countries. Women have constituted just 26.8% percent of the members of parliaments across the OECD in 2012, up from 19.9% in 2009.

The existing literature has often emphasized both the role of female representation in a representative body (indirect participation) and the individual preferences of female politicians (direct participation) in policy outcomes which reflect women's interests and preferences. On the other hand, there is sufficient amount of evidence that women and men

have different policy preferences. Their common argument is that women are more likely than man invest in children and favour redistribution and they give priority to public policies related to their traditional roles as care givers in the family(Tho90; BC00; Duf03; CD98; EP02; CD04; ALF05). For instance, the survey conducted between 2006 and 2008 by the Inter Parliamentary Union (IPU) indicates that most female policymakers share certain general interests and concerns (e.g family specific policies related to child health, maternal health), and feel that they have a responsibility to represent women. This does not necessarily imply, however, that female political representation has an impact on policy decisions which reflect women's interests. According to Median Voter Model (Downs (1957)), if the candidates only care about winning the elections and commit to implementing specific policies once elected, political decisions only reflect the preferences of the median voters. That means the preferences of a politician would not matter for policy outcomes.

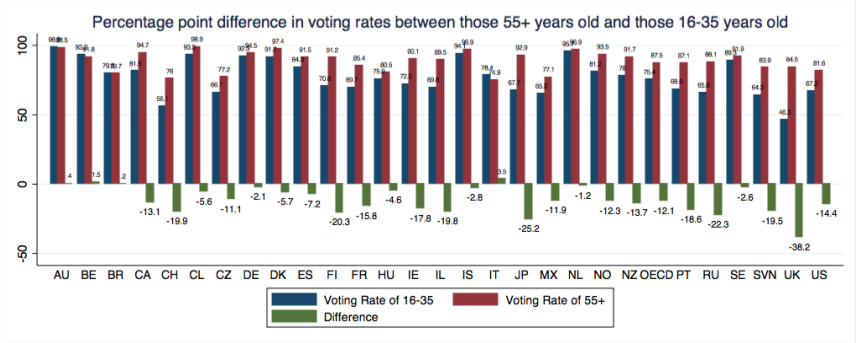
This thesis has been consisted of three self-contained essays that address topics regarding the link between female political representation, family-specific social policies and child health outcomes. The first one of the three essays has focused on role of the parental leave policies on the child health. OECD countries use parental leave policies to support families (especially mothers who are pregnant or recently given birth) for their efforts to care for newborns. Parental leave policies has two dimensions as follows: a) job protected leave as the number of weeks after or before the child birth b) financial support as cash benefits during the parental leave period. Although the preliminary role of parental leave entitlements is to provide a care for children, it may take a place among women's preffered policies due to its role on female labor market outcomes as well. Although one of the aims of these policies to provide a care to meet the objectives of child well-being, the preliminary result of the first essay shows no evidence for a significant relationship between the public spending on parental leave benefits and child health outcomes over the forty years across OECD countries. In cases where public spending is found to have low or negligible effect on development outcomes, two explanations are given in the previous literature. First, it is argued

that the link between public spending and development outcomes could be severed because an increase in public provision could lead to a crowding out of private sector provision. The second set of possible reasons for the ineffectiveness of public spending includes poor targeting and/or institutional inefficiencies. Considering the fact that spending on parental leave benefits are solely provided by the public sector, the former case of the private crowing out effect does not explain the lack of a relationship between parental leave benefits and child health outcomes. The existing studies on the relationship between the inefficiency of institutions in resource allocation and the develoment outcomes has mainly focused on the bribes that corrupt politicians might levy. However welfare transfers such as parental leave benefits, old-age benefits are such policies where corrupt politicians may find almost no room(Mau98).

The reason for the lack of a relationship between public spending allocations and child health outcomes might be both a "crowding out effect" or institutional efficacy, however in different forms. The OECD Social Expenditure Database groups benefits or expenditures with a social purpose in nine policy areas (e.g old-age benefits, housing benefits, unemployment benefits, family-specific benefits, health etc.). A crowding-out effect within social expenditure areas may occur. In short, high spending on traditional programmes impedes the development of new ones. For instance, due to the population structure of most of the OECD countries, old-age benefits may de facto crowd out spending on other programmes which may not be in strong competition. The population structure is a key driver of social spending across OECD countries and most social spending goes to the elderly population. Although after the recent economic crisis (2007/08), the share of family-specific spending, which includes parental leave benefits, is increased with the idea of social support for future generations, social spending on the elderly amounted to 11% of GDP in overall total social welfare spending that 22% of GDP in 2009. Less than 5% of total social welfare spending is shared among unemployment, housing, spending on active labor market programmes and family-specific spending. The share of the parental leave benefits was only 0.3% of GDP, up from 0.14% in 1980(OEC13f).

In the consideration of above-mentioned studies which emphasize that women as either being the direct or the indirect participants of politics give priority to public policies related to their traditional roles as care givers in families, it is possible to think whether the persistent under-representation of women in politics would be a reason for this disproportional resource allocation among social welfare areas. The second essay of the thesis, therefore, seeks to assess the link between parental leave benefits, female political participation and child health outcomes. More specifically, it is examined that whether the persistent under-representation of women in parliaments has played a role for the inefficacy of parental leave benefits on child health outcomes over the forty years across OECD countries. Overall empirical results support the notion that the interaction of the percentage share of the female parliamentarians and public spending on parental benefits has not been relevant on the child mortality rates. However, as Median Voter Theorem indicates that if candidates are office-seeking with electoral motives, public policy decisions will reflect the median voter' preferences which is selected by a majority rule voting system. Namely, even if there exist high percentage of female political representation, the preferences of the female politicians may not be relevant on policy decisions which reflect women's interests. On the one hand, the reason of the insufficient allocation towards parental leave benefits would be the political under-representation of women in policy decision making. On the other hand, the disparity in the resource allocation within social welfare areas might be a rational response by vote-seeking politicians due the population of many OECD countries is getting older and those are with the greatest propensity to vote. Moreover, electoral participation is falling fastest among the young across the OECD countries, which gives to older voters greater influence in the political process. For instance, in 2010 British general election, just 44% of young people aged at 18-24 voted compared to 76% of those aged over 65. In general, older people are much more likely to vote than younger people across OECD countries. Among OECD-34, Italy, Belgium and Australia are the only countries with a small tendency for the young people to vote more than the old people. The higher participation of elderly people in national

elections, as well as the growing share of the elderly population may also influence the political process, as introducing budget cuts in social welfare spending that unequally benefit the old. By 2011, the average percentage point difference in voting rates between those aged over 55 years old and those aged between 16-35 years old in OECD was 12.1%(OEC11).



Considering the last forty years trend of social welfare expenditures across OECD countries, the highest share of the old-age benefits compared to family-focused policies such as parental leave benefits is not suprising since majority of the population across OECD countries are elderly. The benchmark democracy model of Down(1957) supports this fact for which majority of rule voting system will select the most prefered outcome of the policies. However democracy does not always correspond to some ideal of political equality (Ace06) and since electorally accountable governments often fail to reflect the interests of different groups, representative democracy should apply for the equal representation of citizens in policy-making on public spending allocation(Pan03). Directly after the "Representative Democracy Model (Citizen Candidate Model)" of (Besley and Coate,1997), there is sufficient amount of research has emphasized on the female identity of politicians on family-focused policy outcomes which directly target women and children. Considering the persistence trend of female under-representation in OECD parliaments (at the end of the 2000s, the percentage share of female seats has been only 19.9%) over forty years, the role of female under-representation in

politics has been analyzed to see whether it is one of the determinants for the insignificant relationship between parental leavel benefits and child health outcomes. The second essay of the thesis has focused on answering this question. The empirical results presented in the second chapter supports the notion that the interaction of female political representation and public parental benefits over forty years across OECD countries, has not been relevant in reducing the child mortality rates. One the one hand, the reason would be the political under-representation of women in policy decision making but on the other hand the gender of the politician might not matter in the resource allocation decisions of social welfare spending across the OECD area. It is simply what Down(1957)'s Median Voter's Theorem suggest where politicians' preferences and personal characteristics do not matter in public policy choices.

Chapter 4, therefore, has focused on the role of female politicians on policy-making which reflects women's interests. Does gender really matter in policy making on the resource allocation among social welfare areas in the OECD? To see the relationship between female political representation and family-specific policies including also countries which are recently joined OECD this study takes into account public spending on family allowances as the main field of the interest. The overall results support two basic hyphothesis; a) there has been no evidence for a positive significant relationship between the fraction of female parliamentarians and public spending on family allowances over the 30 years across OECD countries b) Policy changes in terms of public spending choices on family allowances can be driven by the female politicians only when the percentages of women in the parliaments exceed a remarkable value. It is important to emphasize that overall analyses in this thesis do not address the causation but entire results are robust to using different samples, to using different econometric frameworks such as Arellano Bond (GMM) or Prais-Winsten (AR(1)) and to including additional covariates.

Appendix A

Parental, Maternity and Child Care Policies in OECD Countries

A.1 The Definition of Parental, Maternity and Child Care Policies

Almost all OECD Countries support families for their efforts to care for newborn infants or young children. The support of the governments in Maternity, Parental or Childcare Leave Systems could come in the form of a) job protected leave as the number of weeks after or before the child birth and b) financial support as cash benefits during this leave period. These leaves are granted for various periods of time and paid at different rates among the OECD countries.

Maternity leave refers to the period of rest reserved for women, during pregnancy or immediately after the confinement or adoption. It is one of the elements of maternity protection covered by the ILO Convention No. 183 and Recommendation No. 191 (2000). This convention recommends that a woman should be entitled to a time of maternity leave of at least 14 weeks. Almost all OECD countries have ratified the minimum duration of 14 weeks of paid leave as recommended by the International

Labour Organisation (ILO), and many countries grant maternity leave entitlements that exceed the 14-week minimum (ILO, 2010). Most countries allow beneficiaries to combine pre and post-birth leave, while some mandate a short period of pre-birth leave and six to ten weeks after childbirth. Almost all OECD countries provide specific public income support payments that are tied to the length of maternity leave[1].

Parental leave refers to longer periods of leave which is obtained after maternity and paternity[2] leave. If the eligibility for public income support is not family-based (which is the case often), the entitlement of parental leave is individual, so that only one parent can claim the support. Although the OECD categorizes leave schemes under three main fields as; Maternity, Paternity and Parental Leaves, in some countries parental and childcare leaves have been distinct from eachother. Childcare leave is generally provided for 26 weeks and might be extended by an additional 26 weeks under some circumstances. Parents have often the right to use it until the child is nine years of age.

A.2 Maternity, Parental and Child Leave Schemes in OECD Countries

Australia: In 1973 Commonwealth employees were entitled to a 12-week of paid maternity leave, but this did not apply to the private sector. The introduction of the first national scheme was in 2011 for the parental leave. Currently, there is no statutory entitlement to maternity leave but women may take up to six weeks (prior to the expected birth) under the parental leave scheme. Moreover parental leave entitlement provides for up to 12 months leave for only one parent who takes the responsibility of childcare. The eligible mothers or fathers may receive payment for up to 18 weeks of this leave under the parental leave scheme(AWD12; GB11).

[1]United States is the only OECD country that has no nationwide legislation on paid maternity leave. Some states provide income support through either sick-leave insurance or maternity-leave programmes.

[2]Paternity leave refers the paid leave often at full wage payment for the absence of employed fathers at the time of confinement.

Austria: Austria introduced the first paid maternity leave in 1911 which contained 4 weeks of leave and was paid as 60% of earnings. In 1958, the number of paid weeks was increased to 6 weeks which covered before and after the childbirth at 100% of earnings(GB11). By 2012, sixteen weeks (eight weeks before the birth and eight weeks after the birth) of maternity leave is obligatory to use and the benefits are the one hundred per cent of average income for employees(RP12). In addition to maternity leave entitlement, Austria launched a childcare leave scheme in 1956 for a 6 months period. In 1960, there was an extension from 6 months to 12 months of paid leave. In 1974, the benefit scheme was converted to a flat amount which was 2000 ATS. In 1995, the duration of leave was decreased for one parent to 18 months which was previously increased to 24 months in 1990[3]. In 1997 parents received a parental leave benefit at a flat rate amount of 14 Euros. In 2002, the parental leave benefit scheme was converted to child care leave at a flat rate amount of 14.53 Euros which was paid for the youngest child under the age of three(GB11). By 2012, parents may choose from five different alternatives of childcare benefits. One option is the income-based, the rest has provide a monthly lump sum(RP12).

Belgium: Belgium introduced a paid maternity leave scheme earlier than Austria in 1894 for the 6 weeks of paid leave. The benefits of maternity leave were equal to 60% of earnings in 1958 for the 12 weeks of maternity leave period. From 1975 to 2010, the rates of benefits ranged from 76.4% to 79.5% (GB11). Currently, the maternity leave entitlement is fifteen weeks for employees. Although woman can start to take her leave six weeks before her baby is due, one week before and nine weeks after the delivery are obligatory leave periods. Employees in the private sector are paid at 82 per cent of earnings in the first month and 75 per cent for the remaining weeks with a ceiling of 94.87 per day. Statutory civil servants receive full salary(FL12). Beside an entitlement for the maternity leave, Belgium did not have any national legislation for the parental leave until January 1998. Previously, there was the Career Break (Time Credit) Scheme which was launched in 1986. The Career Break (Time

[3]The remaining 6 months were used by the other parent.

Credit) Scheme allowed to workers a 3 to 12 months paid parental leave from 1986 to 1998. Later on, Belgium introduced a national legislation for the parental leave in January 1998 which allowed parents for a full time paid leave up to 3 months and for a part time paid leave up to 6 months(BP99; D$^+$04; GB11). By 2012, parental leave is four months per child. Leave is an individual entitlement and paid as 679.59 Euros (after taxes) per month(FL12).

Canada: Although job-protected maternity leave was introduced in Canada more than 90 years ago, only 55% of employees were entitled to maternity leave in 1967. The first paid federal maternity leave was launched in 1971 within the Unemployment Insurance (UI) Act which included 15 weeks of leave paid at 66% of earnings. From 1979 to 2010, the rates of benefits ranged from 55% to 60% (PvdG04; GB11). At the moment, women are entitled to 15 to 18 weeks of maternity leave and it may not start earlier than 11 to 17 weeks before the expected date of birth. It is important to not that some provinces the leave is longer of a total of 17 or 18 weeks, however, only 15 weeks are paid at 55 per cent of earnings(ASG12). In addition to maternity leave entitlement, Canada launched a 10 weeks of parental leave, which was paid as 66% of earnings, in 1990. It was extended to 35 weeks in 2001(GB11). By 2012, 35 to 37 weeks of parental leave is entitled in case when there is single parent or when the leave is shared between two parents. If it is a family entitlement the leave period may not be more than 35 weeks. Parental leave benefits are at the same rate as maternity leave (55 per cent of earnings) up to 35 weeks per family(ASG12).

Denmark: In 1915 Denmark started out with the first paid maternity leave which captured 2 weeks of paid leave. It was extended to 14 weeks in 1960 and to 18.6 weeks in 2008. Women currently are entitled to 18 weeks of paid maternity leave which paid as 106 euros per working day or 530 euros per week. The first 2 weeks of the maternity leave are compulsory after the child birth(Tin12). Moreover, in 1985, the first parental leave was launched. Following the 14 weeks of maternity leave, a further 12 weeks were available for one parent in 1999 and it was extended to 32 weeks in 2002. In 2008, the total weeks of parental leave were 52 weeks

(20 weeks were paid at the full wage replacement rate and 32 weeks were unpaid)(GB11). By 2012, each parent is entitled to 32 weeks until the child is 48 weeks but the total leave period cannot exceed more than 32 weeks per family. Payment for parental leave is as for maternity leave(Tin12). In addition to maternity and parental leaves, Denmark commenced with the child care leaves in 1992. In 2000, the right was based on the age of the child who has to be under 8 years old. Although the child care leave was 13 weeks for the each parent, parents were allowed to take a 26-week of leave when the child is under one year or recently adopted. In 2002 the child care leave scheme was abolished in Denmark(RCW99).

Finland: The first paid maternity leave in Finland was introduced in 1964 as 9 weeks of leave and benefits were equal to 0.15% of annual income per day(GB11). This period was extended to 12 weeks in 1972 and to 29 weeks in 1974. In 1981, the Finnish maternal leave was as long as 43 weeks (including 5-8 weeks before the child birth)(GSV06). Currently maternity leave can be taken for one hundred and five working days. During the first 56 days of leave, the payment is equal to 90 per cent of annual earnings and after this initial period of leave, benefit is paid at 70 per cent of earnings. It is obligatory to take maternity leave two weeks before and two weeks after the birth(SLT12). In addition to maternity leave, Finland launched a parental leave scheme in 1985. The first 14 weeks after the birth were reserved for the mother. In 2005, the parental leave period was 54 weeks which reserve the first 20 weeks for the mother and the remaining 32 weeks were for the family with a father quota of 2 weeks(GSV06). By 2012, each family is allowed to take a parental leave for one hundred and fifty-eight working days. During the first one month of the leave, the payment is equal to 75 per cent of annual earnings. After this initial period of leave, the payment is 70 per cent of earnings(SLT12).

France: The first maternity leave legislation was launched in 1909 while the maternity benefits was commenced in 1913. In 1958, maternity leave benefits were equal to 50% of earnings(GB11). Since 2012, new mothers have right to get 16 weeks of paid leave. Taking at least three weeks of the leave before the birth is obligatory, but the remaining

weeks can be taken before or after the child birth[4](JD12). Beside maternity leave scheme, the first parental leave legislation was accepted in 1977 as 24 months. In 1987, the duration of the parental leave was increased to 3 years after the childbirth. France is one of the ten countries where parental leave is a family entitlement[5]. As before, parental leaves are still unpaid but National Family Allowance Fund provides a monthly childcare benefit 566.01 per month. For the first child parents are entitled to get this benefit for six months but the benefit is paid for three years to parents with multiple children(Bak06; GB11; JD12).

Germany: The introduction of the first paid maternity leave was in 1883. Women were entitled for 6 weeks of leave with benefits equal to 50% of earnings. In 1958, the number of weeks were increased to 10-12 weeks (4-6 weeks before and 6 weeks after confinement) with benefits equal to 75-100% of earnings(GB11). Currently, mothers are entitled to 14 weeks of maternity leave which is taken as six weeks before and eight weeks after the birth. The maternity leave benefits are paid as 100% of earnings(BE12b). The first parental leave scheme for a 10 months leave duration was implemented in 1986. The number of months were increased to 12, 15, 18 and finally to 36 in 1988, 1989, 1990, 1992 respectively. a paid parental leave of 10 months was introduced. It was extended to 12 months in 1988, 15 months in 1989, 18 months in 1990, and finally to 36 in 1992 it was extended until the childs third birthday(GB11). By 2012, families are entitled to 36 months of leave and it has been paid for a period of 14 months as 67 per cent of earnings(BE12b).

Greece: The introduction of the first paid maternity leave was in 1934. Mothers were entitled to 12 weeks of paid leave with benefits equal to 33% earnings. In 1958, the payment was increased to 50% of earnings with an additional benefit which equals to 10% of earnings for each dependent(GB11). Since 2012, maternity leave has taken for 17 weeks as 8 weeks before and 9 weeks after the parturition with a benefit equals to 100% of earnings(HK12). In addition to maternity leave scheme, an

[4]For three or more children, women are entitled to 24 weeks of maternity leave

[5]The other countries are Australia, Austria, Canada, Denmark, Estonia, Germany, Hungary, Poland and Spain.

unpaid parental leave scheme was launched in 1984. Both parents were entitled to a 3 months of unpaid leave which might be received until the child is three and a half(GB11). Since 2012, each parent may take a 4 months of unpaid leave until the child is 6 years of age(HK12).

Ireland: The first maternity leave for 4 weeks was initiated in 1913 with a lump-sum benefit. In 1958, the number of weeks were increased to 12 weeks (as 6 weeks before and 6 weeks after the birth)(GB11). Since 2012, the period of maternity leave has been 42 weeks (26 weeks are paid as 80% of earnings and the remaining 16 weeks have been unpaid)(Dre12). Parental leave is currently unpaid and can be received for 14 weeks. Under the Parental Leave Act of 1988, the leave could then be taken until the childs fifth birthday. Later on, this was expanded to the childs first eight years, under the Parental Leave Act of 2006[6](Dre12; GB11).

Italy: The first paid maternity leave is implemented in 1919. It included 4 weeks of leave which was paid as a lump-sum payment. In 1958, there was differentiation for the amount of leave among sectors, such as 13 weeks for the workers in the industries, 8 weeks for agricultural workers, and 6 weeks for workers in the commerce sector. Working women in all these sectors were entitled to a leave which was paid at a rate of 80% of earnings. In 1961, a new regulation brought uniformity across all working groups, benefits again were equal to 80% of earnings, and were payable for 21 weeks(GB11). Since 2012, the length of the maternity leave has been 5 months, paid as 80% of earnings. Moreover, the Tribunal of Florance extended the conditions of this entitlement in the case of if the mother is housewife, ill or self-employed without a social security membership, the father can receive the full amount of the maternity leave(AG12). In addition to maternity leave, a parental leave scheme was launched in 1973 for six months at the same rate of maternity leave payment. In 1999, entitlement was renewed as an individual right for both parents, which can be received until the child's nine years age(GB11). Since 2012, each parent are entitled to 6 months paid parental leave. It is again individual entitlement but the length of the leave cannot exceed 10 months if it is received

[6]The maximum age has been determined as 16 years in case of children with handicaps.

by both parents. Parental benefits are paid as 30% of the earnings if the child is under 3 years old. In the case of the child being between 3 and 8 years of age, leave is unpaid(AG12).

Japan: The first maternity leave was launched in 1922. Mothers were entitled to 10 weeks of leave which was paid as 60% of earnings. In 1958, the number of weeks were increased to 12 weeks but the wage replacement rate remained as 60%(GB11). Since 2012, mothers are allowed to receive 14 weeks (6 weeks are obligatory period of time which has to be taken before the child birth.) of leave which is paid as 66.7% of earnings. In addition to maternity leave, parents are individually entitled to a 12 months parental leave which is paid as 50% of earnings. If both parents share the leave, there is an extension from 12 months to 14 months(HJ12).

Luxembourg: In 1925, Luxembourg introduced the first maternity leave scheme which allowed mothers to take 8 weeks of leave. The maternity leave payments were equal to 50% of earnings. In 1958, Luxembourg increased both the number of weeks and benefits which were 12 weeks and 50-75% of earnings respectivelygauthier2011. Since 2012, there has been 16-weeks compulsory leave scheme which is applied as 8 weeks before and 6 weeks after the confinement. The current maternity leave payment is equal to 100% of earnings. The length of the paternal leave is 6 months per parent which is paid at a flat rate as 1,778 euros per month(ZL12).

Netherlands: The first maternity leave scheme was launched in 1913. Women were entitled to 12 weeks of leave paid at 100% of earnings in 1913(GB11). Since 2012, the total length of the maternal leave is 16 weeks which are received as 6 weeks before and 10 weeks after the child birth. Maternity payments are equal to 100% of earnings(GK12). The first parental leave was introduced in 1990 which allowed parents to take 6 months. However, leave was unpaid at that time. 2009 is the first year when a paid leave scheme was introduced. It was a tax relief(GB11). Currently, the leave is still received as a tax reduction of 723 euros per month and can be taken until the childs 8th birthday(GK12).

New Zealand: Introduction of the first paid maternity leave was in 1926. It included 4 weeks of leave which was paid as a lump-sum

benefit(GB11). The current implementation is fourteen weeks which women can start to take the leave from six weeks before the child birth and the leave payment is equal to 100% of earnings, up to a ceiling of 281 euros per week. In addition to maternity leave, an unpaid parental leave may be taken in the 12 months after birth, up to 52 weeks(Hea12).

Norway: In 1915, the first paid maternity leave scheme was launched which allowed women to take 8 weeks of leave. Women were entitled to a payable leave at a flat-rate for 12 weeks (6 weeks before and 6 weeks after the childbirth) in 1958. Since 1977, there is no separate maternity leave but women are allowed to take a leave under parental leave scheme(GB11). By 2012, under the parental leave scheme, mothers and fathers are entitled to 9 and 12 weeks of respectively. Total number of weeks range between 47 and 57 weeks depending on the payments which change between 80% and 100% of earnings respectively. If payments are received equal to 100% of earnings, a 10-weeks reduction applies on the length of leave. Either father or mother takes remaining 26 or 36 weeks of leave which is called as family entitlement(BE12a).

Portugal: The first maternity leave was introduced in Portugal in 1922. The length of the leave was 10 weeks with benefits which are equal to 100% of earnings(GB11). Since 2009, maternity leave scheme has been replaced with a parental leave which is called Licena parental inicial (Initial Prental Leave). Depending on the payment level, which is equal to either 100% or 80% of earnings, the length of the leave could be either 120 or 150 calendar days. Initial Prental Leave scheme stipulate 45 days (after the birth) obligatory leave period for mothers and the remaining days could be shared between parents(KM12). Before the maternity and parental leave schemes were sperated, parental leave was an unpaid leave of 26 weeks in 1984 which might be extended to 2 years in special circumstances. In 2000, the leave was again unpaid for 3 months per parent(GB11). Currently there are two more supplementary parental leaves in addition to Initial Parental Leave scheme ; a)Parental leave for only fathers: Fathers are entitled to twenty days of leave which is paid as one hundred per cent of earnings. During the first month after birth, 10 days are obligatory to use. b) Additional Parental leave: It is an individ-

ual entitlement which parents can take for three months. It is paid as 25% of the earnings. Payment can only be done to one parent at a time. If the three months are taken as unpaid parental leave both parent can receive it at the same time(KM12).

Spain: Spain launched the first maternity leave in 1929. Mothers were entitled to 10 weeks of leave which was paid at a flat rate. In 1958, the number of weeks were increased to 12 weeks with a payment which was equal to 60% of earnings(GB11). Currently, the length of the maternity leave is 16 weeks and it is compulsory to receive the 6-weeks of leave before the confinement. The remaining 10 weeks could be used both before or after the child birth. Mothers are entitled to maternity payments as 100% of their earnings. In addition to maternity leave, parents are individually entitled for an unpaid paternal leave which could be received until the third year of childs birthday(Ann12).

Sweden: The first maternity leave scheme of Sweden was introduced in 1931 which included 8 weeks of paid leave with a lump-sum benefit. In 1974, maternity leave was replaced by parental leave(GB11) but currently, parental leaves are implemented alongside maternity leave. It is compulsory for women to receive at least two-weeks maternity leave before or after the confinement. There is another type of leave called Temporary Leave which has ten days length used during the first 60 days after the confinement. It is paid leave at the 80% of earnings per year. Thirdly, parents were entitled to a paid parental leave for 480 days. The first 390 days are paid as 80% of earnings. For the remaining 90 days, a flat rate benefit applies. Each parent individually receives 60 days of leave and they are not transferable between mothers and fathers. The remaining days are divided equally among parents and transferable to each other(HDC12).

Switzerland: Switzerland introduced the first maternity leave in 1911 which included 6 weeks of paid leave(GB11). Since 2005, 14 weeks of maternity leave has been implemented and 8 weeks of the leave must be received following to childbirth. It is a paid leave equal to 80% of earnings per month. There is curently no entitlement for parental leave in Switzerland(Val12).

The United Kingdom: The first maternity leave was launched in 1911

which included 4 weeks of paid leave. In 1958, the number of weeks were increased to 18 weeks which were paid at a flat rate. In 2007, the length of the paid maternity leave was 39 weeks(GB11). Currently, mothers are entitled to 52 weeks of maternity leave which starts as 11 weeks before the confinement. Out of 52 weeks, 13 weeks are unpaid. Payments are received as 90% of earnings for the first 6 weeks and the remaining 33 weeks, a flat rate payment which equals to 135 euros applies. Fathers are entitled to two-weeks of paternity leave which is paid as 90% of gross weekly earnings. Parental leave has been individually received as 13 weeks per parent. It is an unpaid entitlement. Leave could be received until the childs 5th birthday(OM12).

The United States: There is no statutory right to any of the types of paid leave at national level[7]. The federal Family and Medical Leave Act (FMLA) provides a sort of leave for a variety of reasons (e.g childbirth or the care of a newborn child up to 12 months, for the placement and care of an adopted child, for the care of a seriously ill child, spouse or parent etc.). Leave can be used up to 12 weeks in a 12 month period before and after the child birth(KW12).

[7]Five states (California, Hawaii, New Jersey, New York, Rhode Island) and Puerto Rico have Temporary Disability Insurance (TDI) programmes which can apply before or after the child birth as well.

Appendix B

Data Sources and Definitions for Chapter 1 and Chapter 2

B.1 Independent Variables

1.GDP Per Capita Definition: PPP Converted GDP Per Capita (Chain Series), at 2005 constant prices.
Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 7.1, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, July 2012.

2.Total Health Expenditures as a percent of GDP
Definition: The sum of expenditure on activities that through application of medical, paramedical, and nursing knowledge and technology. Total health expenditures used as an independent variable in this paper is defined by OECD as the sum of following items; Services of curative care, Services of rehabilitative care, Services of long-term nursing care, Ancillary services to health care, Medical goods dispensed to out-patients, Services of prevention and public health, Health administration and health insurance, Expenditure on services not allocated by function, Investment

(gross capital formation) in health.
Source: OECD (2013), "OECD Health Data: Health expenditure and financing", OECD Health Statistics (database).

3.The female employment/population ratio
Definition: Propotion of an economy's female population aged 15-64 that is employed.
Source: OECD (2010), "Labour Market Statistics: Labour force statistics by sex and proportion of age group".

4.The female education aged between 15-44
Definition: Mean years of education of women aged between 15-44.
Source: Institute for Health Metrics and Evaluation. Educational Attainment and Child Mortality Estimates by Country 1970-2009. Seattle, United States: Institute for Health Metrics and Evaluation, 2010.

5. The fertility rate (children per women aged 15 to 49 years old)
Definition: Fertility rates express the average number of children a woman would have if she lived to the end of her childbearing years (conventionally considered to be 15-44 but sometimes 15-49) and bore children at the prevailing rate for each age during that period.
Source: OECD (2013), "OECD Health Data: Demographic references", OECD Health Statistics (database).

6.The share of population with health insurance coverage
Definition: It is defined in OECD Health at a Glance (Europe 2013) as following; "Coverage for health care is the share of the population receiving a defined set of health care goods and services under public programmes and through private health insurance. It includes those covered in their own name and their dependents. Public cover- age refers both to government programmes, generally financed by taxation, and social health insurance, generally financed by payroll taxes. Take-up of private health insurance is often voluntary, although it may be mandatory by law or compulsory for employees as part of their working conditions. Premiums are generally non-income-related, although the purchase of

private cover can be subsidised by the government".
Source: Priliminary source is OECD Health Data: Social protection (2013). The missing values for the countries included also Ruhm(2000)'s analysis are filled by using his database.

7. Public Spending on Parental leave benefits
Definition: Cash benefits paid during total leave period as a percent of female wages in manufacturing.
Source: Gauthier and Bortniks Comparative Maternity, Parental, and Childcare Leave and Benefits Database (1960-2010)

8. Public Spending on Maternity leave benefits
Definition: Cash benefits paid during the maternity leave as a percent of female wages in manufacturing.
Source: Gauthier and Bortniks Comparative Maternity, Parental, and Childcare Leave and Benefits Database (1960-2010)

B.2 Dependent Variables

1.The natural log of under-5 mortality rate
Definition: Total number of child deaths under five years of age per 1,000 live births
Source: IHME(2010), Infant and Child Mortality Estimates by Country (1970-2010)

2. The natural log of neonatal mortality rate
Definition: Total number of infant deaths under twenty eight days of age per 1,000 live births
Source: IHME(2010), Infant and Child Mortality Estimates by Country (1970-2010)

3.The natural log of postneonatal mortality rate
Definition: Total number of infant deaths between twenty eight days and

one year of age per 1,000 live births
Source: IHME(2010), Infant and Child Mortality Estimates by Country (1970-2010)

Appendix C

Public Spending on Maternity Leave Benefits and Child Health Outcomes across OECD Countries

C.1 Public Spending on Maternity Leave Benefits and Child Health Outcomes across OECD Countries

As it is explained in the section (2.2), "parental leave benefits" is a generic term which captures the total amount of payments that are provided to parents under all types of leave entitlements. These are maternity leave entitlements, parental leave entitlements and child care leave entitlements. Among those entitlements, the most traditional one is the maternity leave entitlements which provide benefits especially in the very early period of newborn. To examine whether maternity leave benefits alone are relevant for the child health outcomes, I have analyzed the relationship between maternity leave benefits and child mortality rates as well. Overall analyses where the main independent variable is maternity

leave benefits use a dataset which covers 22 OECD countries from 1970 to 2010. The summary statistics for this dataset is shown at Panel (A1) in Table-20. Panel (A2) in Table-20 represent the summary statistics of another sample which is used for the estimations that controls for additional covariates. Table 21-23 show the relevant estimation results where the main dependent variables are neonatal, postneonatal and under-five mortality rates respectively. Similar to the lack of a relationship between public spending on parental benefits and child health outcomes, maternity leave benefits show also no relevance on the child health outcomes.

Table 20: Summary statistics

	(1)	(2)	(3)
SAMPLES			
PANEL A1: Parental Leave Benefits and Child Health Outcomes (without controls)			
	Mean	**Std. Dev.**	**N**
The natural log of neonatal mortality rate	1.698	0.577	902
The natural log of postneonatal mortality rate	1.012	0.582	902
The natural log of under-5 mortality rate	2.21	0.561	902
Public spending on maternity leave benefits	0.567	0.386	902
PANEL A2: Parental Leave Benefits and Child Health Outcomes (with controls)			
The natural log of neonatal mortality rate	1.533	0.484	540
The natural log of postneonatal mortality rate	0.854	0.495	540
The natural log of under-5 mortality rate	2.051	0.473	540
Public spending on maternity leave benefits	0.563	0.385	540
The share of population with health insurance coverage	97.721	7.362	540
Total Health Expenditures as a percent of GDP	8.040	1.486	539
Log(GDP per capita)	10.174	0.303	540
The female employment (aged between 15-64)/population ratio	0.581	0.109	539
The fertility rate (children per women aged 15 to 49 years old)	1.704	0.291	540

Columns (1) of each sample show mean values which are the average values of observations with standard deviations represented in Columns (2). "N" stands for the number of observations in samples. The first sample at Panel (A1) is used for the estimations which do not include any control variable. It is an annual balanced panel data for 22 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, The United States.) between 1970 and 2010. However, estimations with additional control variables are done using the sample which is represented at Panel (A2). This sample covers only 15 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Japan, The Netherlands, Norway, Portugal, Sweden, Switzerland, The United Kingdom) through the period from 1975 to 2010, due to the incomplete observations for some countries and years.

Table 21: Relationship Between Maternity Leave Benefits and Neonatal Mortality

	Pooled-OLS	FE	FE	AB	FE	FE	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public Spending on MLB	0.00027	-0.06637	-0.06618	-0.00822	0.00637	0.00098	0.00094	0.00762
	(0.00627)	(0.04636)	(0.05774)	(0.02246)	(0.02811)	(0.03894)	(0.04063)	(0.01649)
Lag(Log Neonatal M.)	0.95757***	0.83712***	0.47039***	0.85421***	0.94547***	0.85664***	0.83923***	0.76899***
	(0.00989)	(0.02915)	(0.09952)	(0.01528)	(0.02228)	(0.01424)	(0.01517)	(0.03413)
Health Care Coverage					-0.00099**	-0.00110*	-0.00069	-0.00065
					(0.00044)	(0.00057)	(0.00045)	(0.00047)
Total health expenditures					-0.00637	-0.00431	-0.00312	-0.00414
					(0.00498)	(0.00363)	(0.00354)	(0.00376)
Log(GDP per capita)					-0.04657	0.00562	-0.06944**	0.01311
					(0.04079)	(0.03388)	(0.03456)	(0.04876)
Female Employment Rate					0.12922**	0.21357**	0.16021*	0.24232***
					(0.05136)	(0.09638)	(0.09552)	(0.09276)
Fertility Rate					0.00871	0.05119**	0.05935***	0.01829
					(0.02144)	(0.02356)	(0.02210)	(0.01746)
R-Square	0.98442	0.98380	0.99069		0.99543	0.99600		0.99447
Number of Cases	901	901	901	836	538	538	493	538

Columns(1-4) represent results on the relationship between public spending on maternity leave benefits and neonatal mortality rates without controling any covariates. Columns(5-8) add additional covariates. The dependent variable is the logarithm of neonatal mortality rates which refers to the total number of infant deaths under twenty eight days of age per 1,000 live births. Pooled cross-sectional OLS regression estimates in column (1) with robust standard errors in parentheses. Columns (2,3,5,6) represent the fixed effect estimates with country dummies and robust standard errors in parentheses. Except the fixed effect specifications in columns (2 and 5), all estimation techniques in the rest of the table include country specific time trends as well. Columns (4 and 7) use the GMM of Manuel Arellano and Stephen R. Bond (1991), with robust standard errors, which are instrumented for the log(neonatal mortality) using a double lag. The econometric frameworks in columns(1-4) use the sample which is an annual balanced pane data that covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2010. The econometric frameworks in columns(5-8) investigate the relavant relationship while controlling other variables such as natural log of GPD per capita, share of the population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios.To control for contemporaneous correlation, panel-corrected standard errors are reported in column (8) which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. The econometric frameworks in columns(5-8) use the sample which is an annual balanced pane data that covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2010. All regressions in the table include year dummies. Except the pooled-OLS specification, they all include country dummies as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. MLB is the abbreviation for Maternity Leave Benefits.

Table 22: The Relationship Between Maternity Leave Benefits and Postneonatal Mortality

	PANEL A							PANEL B
	PooledOLS	FE	FE	AB	FE	FE	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public Spending on MLB	-0.00867	-0.08609	-0.06830	-0.00811	0.00439	-0.00483	-0.00539	0.00198
	(0.00735)	(0.06282)	(0.06459)	(0.02035)	(0.02465)	(0.03436)	(0.03578)	(0.01631)
Lag(Log Postneonatal M.)	0.95807***	0.81401***	0.32706***	0.85062***	0.95941***	0.85470***	0.84330***	0.75877***
	(0.01234)	(0.04928)	(0.11386)	(0.02158)	(0.02051)	(0.01674)	(0.01628)	(0.03353)
Health Care Coverage					-0.00103**	-0.00111*	-0.00059	-0.00068
					(0.00040)	(0.00054)	(0.00046)	(0.00051)
Total health expenditures					-0.00639	-0.00473	-0.00366	-0.00422
					(0.00406)	(0.00347)	(0.00357)	(0.00368)
Log(GDP)					-0.04883	0.00366	0.05367	0.01463
					(0.03760)	(0.03043)	(0.03788)	(0.04614)
Female Employment Ratio					0.09275**	0.18206**	0.14212	0.21820**
					(0.03866)	(0.08323)	(0.08824)	(0.08513)
Fertility Rate					0.00665	0.04172*	0.04635**	0.00917
					(0.01779)	(0.02029)	(0.01853)	(0.01691)
R-Square	0.97694	0.97466	0.98935		0.99570	0.99626		0.99445
Number of Cases	901	901	901	836	538	538	493	538

Columns(1-4) represent results on the relationship between public spending on maternity leave benefits and postneonatal mortality rates without controling any covariates. Columns(5-8) add additional covariates. The dependent variable is the logarithm of postneonatal mortality rate which refers to total number of infant deaths between twenty eight days and one year of age per 1,000 live births. Pooled cross-sectional OLS regression estimates in column (1) with robust standard errors in parentheses. Columns (2,3,5,6) represent the fixed effect estimates with country dummies and robust standard errors in parentheses. Except the fixed effect specifications in columns (2 and 5), all estimation techniques in the rest of the table include country specific time trends as well. Columns (4 and 7) use the GMM of Manuel Arellano and Stephen R. Bond (1991), with robust standard errors, which are instrumented for the log(neonatal mortality) using a double lag. The econometric frameworks in columns(1-4) use the sample which is an annual balanced pane data that covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2010. The econometric frameworks in columns(5-8) investigate the relavant relationship while controlling other variables such as natural log of GPD per capita, share of the population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios.To control for contemporaneous correlation, panel-corrected standard errors are reported in column (8) which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. The econometric frameworks in columns(5-8) use the sample which is an annual balanced pane data that covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2010. All regressions in the table include year dummies. Except the pooled-OLS specification, they all include country dummies as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. MLB is the abbreviation for Maternity Leave Benefits.

Table 23: Relationship Between Maternity Leave Benefits and Under-Five Mortality

	PANEL A							PANEL B
	PooledOLS	FE	FE	AB	FE	FE	AB	PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public Spending on MLB	-0.00295	-0.07015	-0.06394	-0.00988	0.00566	-0.00074	0.00017	0.00653
	(0.00616)	(0.04729)	(0.05785)	(0.02216)	(0.02675)	(0.03741)	(0.03974)	(0.01626)
Lag(Log Under-Five M.)	0.95616***	0.84608***	0.45383***	0.85530***	0.94710***	0.85647***	0.84211***	0.76571***
	(0.01104)	(0.03607)	(0.12632)	(0.01700)	(0.02249)	(0.01462)	(0.01535)	(0.03367)
Health Care Coverage					-0.00102**	-0.00109*	-0.00065	-0.00065
					(0.00042)	(0.00056)	(0.00046)	(0.00048)
Total health expenditures					-0.00653	-0.00437	-0.00324	-0.00412
					(0.00456)	(0.00350)	(0.00342)	(0.00368)
Log(GDP)					-0.04781	0.00556	0.06223*	0.01508
					(0.03904)	(0.03180)	(0.03435)	(0.04699)
Female Employment Ratio					0.11598**	0.20025**	0.15959*	0.22946***
					(0.04328)	(0.08885)	(0.09097)	(0.08854)
Fertility Rate					0.00738	0.04753**	0.05412***	0.01463
					(0.01999)	(0.02213)	(0.02033)	(0.01689)
R-Square	0.98372	0.98301	0.99061		0.99555	0.99610		0.99522
Number of Cases	901	901	901	836	538	538	493	538

Columns(1-4) represent results on the relationship between public spending on maternity leave benefits and under-five mortality rates without controling any covariates. Columns(5-8) add additional covariates. The dependent variable is the logarithm of under-five mortality rate which refers to total number of child deaths under five years of age per 1,000 live births. Pooled cross-sectional OLS regression estimates in column (1) with robust standard errors in parentheses. Columns (2,3,5,6) represent the fixed effect estimates with country dummies and robust standard errors in parentheses. Except the fixed effect specifications in columns (2 and 5), all estimation techniques in the rest of the table include country specific time trends as well. Columns (4 and 7) use the GMM of Manuel Arellano and Stephen R. Bond (1991), with robust standard errors, which are instrumented for the log(neonatal mortality) using a double lag. The econometric frameworks in columns(1-4) use the sample which is an annual balanced pane data that covers 22 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland,Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States) from 1970 to 2010. The econometric frameworks in columns(5-8) investigate the relavant relationship while controlling other variables such as natural log of GPD per capita, share of the population with health insurance coverage, total health expenditures as a percentage of GDP, fertility rates and female employment to population ratios.To control for contemporaneous correlation, panel-corrected standard errors are reported in column (8) which includes autoregressive processes of order 1 (AR(1)). It indicates the presence of serial correlation and allowing Prais-Winsten regression for the correction of serial correlation. The econometric frameworks in columns(5-8) use the sample which is an annual balanced pane data that covers 15 countries (Australia, Austria, Belgium, Canada, Denmark, Finland,Germany, Ireland, Japan,Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom) through the period from 1975 to 2010. All regressions in the table include year dummies. Except the pooled-OLS specification, they all include country dummies as well. All standard errors are robust for the arbitrary heteroscedasticity and represented in parentheses. One, two and three * indicate significance at the 10, 5 and 1% level respectively. MLB is the abbreviation for Maternity Leave Benefits.

Appendix D

Overview of Family Allowances and Other Social Welfare Policies in OECD Countries

Social expenditures are the policies implemented by public and private institutions targeted at households and individuals in order to support them during circumstances which have adversely affected their welfare. Social expenditures aim to safeguard the working and living environment of the population, and ensure good standards of health and work ability, sufficient income, services, social security at different stages of life. Practically every household at some point receives some form of income transfer or uses social and health services. All of the countries in the high spending category have chosen to devote a relatively large share of their national income to public purposes. This reflects a desire for a larger government role in society and the economy. Countries in the low spending category namely South Korea, the United States, Japan, and Canadatend more toward leaving the private sector to itself with less government intervention.

Australia: The most recent data on social spending in OECD coun-

tries shows that in 2009 Australia spent 21 per cent of GDP on social areas (including old-age pensions, unemployment payments, health, housing, family, active labor programmes, incapacity and survivor benefits) which is less than OECD average(%24). Australia actually spent a little less than most of the other OECD countries and the only countries that spent substantially less than Australia(21 percent of GDP) were developing countries like Estonia(20%), Israel(16.6%), Mexico(8.5%), Chile(14.3%), Turkey(12.8%), the Slovak Republic(19.7%) and Korea(12%)(OEC13f). The low level spending mostly depends on the tax income collected which is lower than other OECD countries as well. Australia is the sixth lowest-taxing country in the OECD. On the other hand, apart from New Zeland, provision of social expenditures in Australia differ from most of the developed countries of the OECD area. Benefits are flat-rate, income (asset) tested and paid from general government revenue. There are no contributions by earnings in the government benefit system. For instance social security is financed by contributions from employers and employees in Europe, the US or Japan, this means that higher-income workers receive more benefits if they become unemployed or are disabled. By contrast, in Australia benefits are income-tested or asset-tested, so payments reduce as other resources increase which refers an efficient poverty reduction by helping to those people in need. Australia heavily depends on income-testing and allocates a higher share of benefits to lower-income groups than any other country in the OECD. The poorest 20% of the population receives nearly 42% of all the money spent on social security while the richest 20 percent receives only around 3% of all the money(WA02). The major spending items are old age benefits (7.3% of GDP) and spending on healthcare (6.9% of GDP) in 2009. Family spending consists of only 2.8% of GDP (1.8% of GDP is spent for family allowances). Australia spent only 4.0% of its GDP on other social policy areas such as unemployment (0.5% of GDP), housing(0.3% of GDP), active labor market programmes(0.3% of GDP),incapacity related benefits(2.3% of GDP), survivor benefits (0.2% of GDP) and others(0.4% of GDP)(OEC13f).

Austria: Austria is one of the countries which spends above the OECD average in social areas. In 2009, It was ranked as the fifth country out of

34 countries who spend more than one third of its GDP to social policy areas. Austria spent 31.2% of its GDP on social benefits followed by France(35.2%), Denmark(33.1%), Sweden(33%) and Belgium(32%) in 2009. Since older age groups has had a growing trend, a large proportion of social expenditure in Austria has been done in respect of the old age function similar with many OECD countries which have dominant old-age profile with respect to the whole population. In 2009, the money spent on old age benefits was equating to 12.7% of GDP while the OECD average was 8.3%. The only two countries which spent much more on old-age benefits were Japan(14% of GDP) and Italy in 2009. Expenditure on health care was in second place with 7.8% as a percentage of GDP. More than two-thirds of social expenditure was thus in respect of old age and health benefits. Significantly lower proportions of expenditure were accounted for by the following functions 1.1% of GDP unemployment, 0.1% of GDP housing, 3.1% of GDP family, 0.8% active labor policies, 3.4% incapacity benefits and 2.0% survivors. The third biggest share from all social spending belonged to incapicity benefits which serves for the cases of permanently total(or reduced) incapacity to work for providing the reintegration into the labour market, as well as special protection for specific groups of people under employment law. Family benefits constituted the fourth major expenditure item with a propotion as 3.1% of GDP. Family allowances consist of only 2.2% of GDP in 2009(OEC13f).

Belgium: Belgium has showed an increasing trend in social expenditure since the begining of the1980s. The share of social expenditure as a propotion of GDP grew 30.6% from 1980 to 2009. According to recent OECD social expenditures dataset (2009), Belgium is the fourth biggest country out of 34 OECD countries with respect to its social spending as a propotion of GDP, however spending on social areas has grown slower compared to most of the OECD countries since 1980s. In Denmark, France, as well as Sweden, the reason for this slow growth is having a developed and effective social protection systems and has been already having higher social spending shares into budgets since the early 1980s. In countries such as Japan, Portugal and especially Greece, the current relative share of social expenditure is smaller than Belgium. However, from

1980 to 2009, the social spending in those countries grew significantly more than the social spending of Belgium. The largest social spending item, 9.4% of GDP in 2009, is old-age benefits and the second largest is health care spending with the propotion as 8.6% of GDP in 2009. Belgium spent only 4.7% of its GDP on other social policy areas such as unemployment (0.9% of GDP), housing(0.0% of GDP), family(0.7% of GDP), active labor market programmes(0.2% of GDP),incapacity related benefits(2.1% of GDP) and survivor benefits (0.8% of GDP). Family allowances has a great decreasing trend from 1980 (2.8% of GDP) to 2009 (1.6% of GDP)(OEC13f).

Canada: According to the OECD, total social spending accounted for 24.3 percent of Canada's GDP in 2009 compared with an average of 24.0 per cent across OECD countries. Considering general situation, Canada is not one of the leading countries which allocates higher ratios of their budgets to general social spending but Canada had the fourth biggest health spending share (9.4% of GDP) after France(10.6% of GDP), Germany(9.7% of GDP) and United States(14.4% of GDP) compared with an average of 6.6 per cent across OECD countries. Canada's spending on healthcare was 4,363 US dollars per person in 2009 (adjusted for purchasing power parity) and was also higher than the OECD average of 3,223 US dollars. Per capita health spending from 1980 to 2009 grew by 77.4 per cent, higher than the OECD average of 46.7 per cent. Following health expenditures, the second main spending item is old-age benefits accounted for 7.8% of Canada's GDP in 2009(OEC13f). The basic old-age pension scheme in Canada was not originally means-tested, but since 1989, it has been means-tested when the wealthy elderly were required to pay-back entitlements. Canada also have a sort of provision which excludes a limited number of low or no-earnings periods (due to interruptions to contributions for illness, unemployment and education) from the pension final benefit calculation. Besides old-age benefits, there are other income-tested supplementary benefits for pensioners (Guaranteed Income Supplement) which are not taxable(Osb01). Considering other items categorized under social policy areas, Canada spent only 5.0% of its GDP on other social policy areas such as unemployment (0.1% of

GDP), housing(1.0% of GDP), family(1.5% of GDP), active labor market programmes(0.2% of GDP),incapacity related benefits(1.1% of GDP) and benefits on survivors(1.1% of GDP). Family allowances consist really a small propotion of GDP which is 0.6% in 2009(OEC13f).

Denmark: Social Spending in Denmark is the second highest at over 33.1% of GDP across the OECD countries in 2009 after France's social spending amounted at 35.2% of GDP. Spending on social areas as a percentage of GDP has grown on 26% from 1980 to 2009 but is slightly less than average growth rate (accounted for 62.8%) across OECD countries. As in most of the OECD countries, the highest propotion of the total social expenditures is belonged to old age benefits, which in this case accounted for 10.7% of GDP . The flat-rate basic pension scheme is funded by general taxation but separate from general social assistance schemes. The second highest share of the total social expenditures is belonged to health spending which was accounted for 7.9% of GDP in 2009. Spending on family benefits and incapacity benefits, compared to other OECD countries, have higher budget shares of 3.9 percent and 5.2 percent of GDP respectively. It is the third biggest country out of 34 countries in respect to expenditures on incapacity benefits after Sweden(5.7% of GDP) and Norway(6.4% in GDP) and the second highest country in spending on family benefits following by Ireland with 4.1% of GDP. However the propotion of family allowances to GDP is only 1% and it increased only 0.2% since 1980(OEC13f).

Finland: The Finnish welfare system fit into the Nordic conception of social welfare where social spending has higher shares of budgets. Finnish social expenditures constituted of about 7 percent of the country's gross domestic product in 1950, roughly equal to what Sweden, Denmark, and Norway were spending. By 1980, Finland's social expenditures had risen to about 19 percent of GDP and Finland became the sixth biggest country out of 34 OECD countries in respect of social spending accounted for 30.6% of GDP in 2009. As it has been in all European countries, the main social spending item is old age benefits (5.1% of GDP in 1980 10.4% of GDP in 2009). Similar with the majority of the member countries (e.g Canada, Sweden), Finland has determined the pensionable

age at 65 years old. The second main social spending item was health care expenditures (5.1% of GDP in 1980 and 7.0% of GDP in 2009) and after health care, the next three welfare state items, are incapacity related benefits(4.8% GDP) expenditures on families (3.3% of GDP) and unemployment benefits(2.0%). Nordic Countries including Finland are leading countries in social expenditures on families. However, compared to other social spending categories such as old-age benefits and health expenditures, spending on family allowances is lower and increased only 0.1% as a percentage of GDP from 1980 to 2009(OEC13f).

France: According to the latest statistics of OECD Social Expenditures Database (2009), France has the highest spending amount on social welfare areas (35.2% of GDP) compared to an average of 24.0 per cent of OECD countries. The gap between the level of France's social expenditures and the lowest spending level (Mexico : 8.5% of GDP) is 29.7 as a percentage of GDP. France is the second leading country (after United states) in terms of spending on health care. The other main driver of the increasing trend in social expenditures has been the rapid growth in old-age benefits due to structural factors such as population ageing. France is the forth biggest country in respect of spending on old-age benefits (accounted for 12.4% of GDP) after Italy (14.4% of GDP), Austria(12.7% of GDP) and Sweden(12.6% of GDP)(OEC13f). France has a two level flat rate schemes. The first one is for the older people who are not eligible for contributory scheme, and a supplementary benefit which covers all the elderly to increase their income level to the basic minimum(Cla97). Following old-age benefits and spending on healthcare, the third main expenditure item in France is family benefits accounted for 3.2% of GDP (family allowances consists only 1.1% of GDP) compared with an average of 2.3 percent across OECD countries. Ireland(4.1% of GDP), Denmark(3.9% of GDP), Sweden(3.7% of GDP), United Kingdom(3.8% of GDP), Hungary(3.6% of GDP), Finland(3.3% of GDP), New Zeland(3.5% of GDP) are the countries spent on family benefits slightly more than France. Considering other items categorized under social policy areas, France spent only 7.8% of its GDP on other social policy areas such as unemployment(1.5% of GDP), housing(0.8% of GDP), active labor market programmes(1.0% of

GDP), incapacity related benefits (2.6% of GDP) and benefits on survivors (1.9% of GDP)(OEC13f).

Greece: According to the latest statistics of OECD Social Expenditures Database (2009), total social spending and public social spending accounted for 25.7 and 23.9 percent of Greece's GDP in 2009 compared with averages of 24.0 and 22.2 per cent respectively across OECD countries. Economic crisis generally led to an increase in social spending (With the increasing trend in joblessness expenditures on unemployment benefits have increased from an average of 0.7% of GDP in 2007 to 1.1% in 2009, average public spending on Active Labour Market Programmes has had slightly smaller increase from 0.5% in 2007 to 0.6% of GDP in 2009, to obstruct the negative effect of the crisis for poorer families countries where family support is largely income-tested, public spending on family benefits (e.g. child benefit, working tax credit and child tax credit) has also increased across the OECD starting with either 2007 or 2008. However, in contrast, Greece had the largest decrease in social spending after the crisis in 2009 and after. Similar to Greece, some of the other countries such as Estonia, Iceland have cut the cash benefits as well. By 2009, compared to other countries, old-age benefits (11.7% of GDP) and expenditures on health care are (6.7% of GDP) the main social spending items for Greece. Although the economic crises had a decreasing effect on social expenditures, old age benefits with 11.2% of GDP was over the OECD average (8.3% of GDP) in 2009. However, spending on health care (6.7% of GDP) was lower than the OECD average (7.0% of GDP). Considering the other items categorized under social policy areas, Greece spent only 5.0% of its GDP on other social policy areas such as unemployment (0.7% of GDP), housing(0.5% of GDP), family(1.4% of GDP), active labor market programmes(0.2% of GDP),incapacity related benefits(1.5% of GDP) and survivor benefits (2.2% of GDP). The propotion of family allowances has increased only 0.1% from 2008 to 2009 which accounted for 0.5% of GDP(OEC12; OEC13f).

Ireland: Compared to other European countries, Ireland has a low rate of social expenditure for a variety of historical reasons which include the influence of the British welfare model. Although the recent

economic crisis led to an increase in Ireland's social spending after 2007, Ireland had the third lowest total social expenditure (25.8% of GDP) after Greece (25.7% of GDP) and Luxembourg(25.3% of GDP) among EU-15 in 2009. Considering EU-19 countries, Ireland had higher social expenditure levels compared to three more countries (Slovak republic(19.7% of GDP), Hungary(24.1% of GDP) and Czech Republic(21.5% of GDP)). However the level was still lower than the OECD average which was 28.1 percent of GDP. Moreover, despite of the higher expenditure levels of other advanced economies, spending on old-age benefits was accouted for 5.6% of GDP in Ireland which was lower than the averages of EU-15(10.4% of GDP), EU-19(10.0% of GDP) and OECD-34(8.3% of GDP) in 2009(OEC13f). There are, however, exceptions to this general characterisation. For instance, the total spending on health care, despite the decreasing trend from 1980s[1] eighth highest among OECD-34 countries as a propotion of GDP in 2009. Furthermore, the next biggest main items of social expenditure in Ireland as family benefits and unemployment related social protection. By 2009, out of 34 OECD countries, Ireland had the first and third highest expenditure level on family and unemployment benefits 4.1 percent and 2.6 percent as propositions of GDP respectively. The Irish social transfers (rather than pensions) are heavily concentrated on low-income individuals and households. There is an obvious advantage in this approach which more directly targets those who need most. Due to this approach, compared to other OECD countries, Ireland has been one of the exceptions to have had large amount of increases in family allowances from 1980 to 2009(Tim03; OEC13f).

Italy: Similar with other European countries, Italy had a high ratio of total social expenditures to GDP in 2009 (30.1%). Almost half of this amount is allocated to old age benefits (pensions). The age dependency ratio of old people to working-age population was 21% in 1980 while Italy had 8 per cent share of old benefits to GDP which was increased to 14.4% of GDP in 2009 while the elderly ratio in the population was 30 percent, almost one third of the working population. The second main

[1]Ireland was the third country with respect to spending on healthcare after Germany and Sweden in 2009.

category of the Italian welfare state spending is health care with 7.5 per cent of GDP after old-age benefits. On the other hand, spending on families were lower than the OECD average. As a result, families are responsible for providing or purchasing most care for their children. In 2009, spending on cash benefits and services for families(1.6% of GDP) was lower in Italy than anywhere else in Europe besides Greece, Poland, Spain and Portugal. The counterpart of an income transfer system mainly based on pensions which means the less involvement of the government in other social areas such as unemployment, family, incapacity benefits. In Italy, the 80 per cent of transfer beneficiars are pensioners, which is higher than the European average. Spending in certain areas such as debt service (12.2% of GDP in 2011) and pensions is high, but in areas such as education, research, family and unemployment benefits is relatively low. Therefore, unemployment assistance, child and family care do need to be reinforced. Family allowances consisted of only 0.5% of GDP in 2009(OEC02; OEC13f).

Japan: In Japan's social expenditure history, major steps were the introduction of public pension and health insurance systems in 1961. Following those launchements, family and child allowances were introduced in 1972. In the following year, unemployment insurance which was introduced on a limited scale in 1947, was expanded into the Employment Insurance System. Social welfare expenditures as a percentage of GDP was 26.4% in 2009 which is higher than the OECD-34 average. However, the shares of areas such as family, active labor market policies and unemployment benefits into total social spending are lower in Japan than in European countries. Social spending as a share of GDP has been expanding in the context of population ageing, although it remains belower than many countries across OECD. The proportion received by the low-income households is small. Consequently, the impact of social spending on inequality and poverty is weak in Japan compared to other advanced economies. The proportion of the population in relative poverty, defined as less than one-half of the disposable median income was 14.9% and 15.7% in mid-2000s and late 2000s respectively in Japan. Japan is the sixth highest in the OECD area with respect to number of people in relative

poverty after Mexico, Israel, Chile, the United States and Turkey. Income inequality and poverty among the working-age population in Japan have risen to levels above the OECD average since 1980s. This trend firstly depends on the ageing of the workforce because the elderly have generally accumulated significant wealth with respect to financing their retirement. Japan was the second highest country over 34 countries in OECD with respect to expenditures on pensions and old age benefits (14% of GDP) after Italy(14.4% of GDP) in 2009. Following pensions and old age benefits, the second and the third main items in social spending as a share of GDP were healthcare (7.3% of GDP) and survivor benefits(1.4% of GDP). Expenditures on other social policy areas except survivor benefits were all under OECD averages such as unemployment (0.7% of GDP), family(1.0% of GDP), active labor market programmes (0.4% of GDP), incapacity related benefits(1.1% of GDP). Japan is one of the countries to spend really less to family allowances (0.3% of GDP) compared to other countries(Jon07; OEC13f).

Luxembourg: Luxembourg has the most generous welfare system among OECD countries. Social expenditures in per capita terms (16,858 dollar at 2000 constant prices) rank highest among OECD countries averaged at 7,407 dollar per head at 2000 constant prices. Luxembourgs generous benefit system is the result of its economic success. The economic boom of the golden 1980s and 1990s caused a sharp increase in the per capita public social spending starting in 1983 and continued for more than two decades. The only exception of the increasing trend of welfare system was the international financial crisis starting in 2007. The per capita social expenditures decreased about 2.2 per cent in 2007 compared to 2006. The share of the total public social spending in GDP decreased from 22.1 per cent to 20.6 per cent. However, it again slightly increased in 2008 and peaked at 24.4% of GDP in 2009. Luxembourg has achieved rapid and sustained growth over the past 25 years and living standards are the highest in the OECD. This substantial economic growth also increased employment in Luxembourg, which has largely been met with crossborder workers. Unemployment has remained low compared to other European countries. These significant improvements occured without substantially

widening the income disparities, itself caused by the generous welfare system. For instance, although the main elements of Luxembourgs social welfare system are health care, old-age pension benefits are at similar levels to other OECD countries, family benefits also have important shares in GDP. Luxembourg has the highest spending level on family allowances (2.5% GDP) across OECD countries(OEC10b; OEC13f).

Netherlands: The Netherlands' first social entitlement was launched in 1897. The first social legislation of the Netherlands was covering some rules only for employing children under 12 years of age, but it was one of the first social legislations in the world. In 1901, the first social insurance scheme as work-injury benefits was launched. Following the work-injury benefits scheme, incapacity and sickness for wage workers were introduced until the Second World War as well. In 1945, the social protection system was extended from just wage workers to the all citizens. The general social protection system was launched as covering old-age,disability, survivor and unemployment benefits. These new legislations mostly took effect in 1950s and 1960s. In the 1960s, other type of schemes on benefits such as national health insurance for people who have low incomes, national school and study allowances and housing benefits were introduced as well. However the expansion period of the social welfare system came to an end with the 1970s oil crisis. The aim of social policies was shifted from welfare to work, namely, income benefits were reduced and labor market arrangements were extended. Since 1980 to mid-1990s, The Netherlands was ranked at most 5th country which has higher social spending level over 34 OECD Countries. However since mid-1990s it took place in the first 11 to 15 countries and finally it was the 16th country in social spending ranking across OECD countries with a share as 25.3 percent of the gross domestic product in 2009. Especially big increases were found in Portugal, Japan and Turkey but social spending in the Netherlands fell as a percentage of GDP for several reasons, including low GDP growth. By 2009, the expenditures on old age benefits and health care spending were 9.9% and 7.9% as a percentage of GDP respectively. They are also one of the few social expenditure categories that were not decreased since the beginning of 1980s. Except some small

increases of housing benefits and active labor market programmes, all other main social expenditure items had lower values compared to their amounts in 1980. Expenditures on housing and active labor market policies were increased only 0.1 and 0.7 percentage points from 1980 to 2009 but survivor benefits, unemployment, family, incapacity related benefits were decreased 0.6, 0.2, 0.8 and 3.4 percentage points respectively. Family allowances has started to increase after 2000 but could not reach its level in 1980(VO06; OEC13f).

New Zealand: Before the 1900s the main items of social welfare system (e.g health and education) were generally delivered at provincial levels, and often through the private sector such as religious organisations and non-governmental organizations. From 1900s to 1940s, the central governments roles in those sectors grew with the idea of "public health and education to all citizens". Moreover, an unemployment benefit scheme was introduced for the people who are available for work in this period. During mid-1930s, a wide range of new income support programmes were launched. The income tested old-age benefit (for the people at the age 60 and over) and a benefit for those who had difficulties in working were the two important schemes of these income support programmes. From 1950s to the 1970s, the post Second World War baby boom led to growth in housing and education spending. From mid-1980s, with the UK's entry into EU, New Zealand faced some changes with respect to policies. Compared to other European countries, New Zealand had a low rate of social expenditure due to the influence of the British welfare model. In 2009, the ratio of overall social expenditures (public and mandatory private) to gross domestic product was 21.7% which was less than the average of 24.0 per cent across OECD countries. Although the general social spending was lower than the OECD average in 2009, spending on family benefits had a higher GDP share compared to other OECD countries. According to the latest statistics of OECD Social Expenditures Database (2009), Family spending (3.5% of GDP) is the third highest category after health spending (8.8% of GDP) and old-age benefits (4.5% of GDP). New Zealand spent 4.9% of its GDP on other social policy areas such as unemployment (0.5% of GDP), housing(0.9% of GDP),

active labor market programmes(0.3% of GDP),incapacity related benefits(2.8% of GDP), benefits on survivors(0.2% of GDP) and others(0.2% of GDP) in 2009(Eas80; OEC13f).

Norway: In Norway, the first welfare reforms came into being when the risk of industrial labour was questioned for the first time. These laws were particularly on insurance and social security benefits to cover loss of income due to work injuries. Social areas such as health and education were not so much concerned at that time but until 1920, many of the regional local councils launched health and eduction programmes as well. After 1920, some councils started to have economic problems and this caused social inequality between regions. The inequality was attempted to be solved with national schemes of governments. First, the child benefit became national in 1946 as flat-rate benefits allocated to families with more than one child. Afterwards, national old-age pension scheme was launched in 1957 with flat rate benefits and the year after the sickness insurance became universal as well. Remarkably, In 1966, the National Insurance Scheme was passed and therefore all the new social security programmes universally applied. The 1970s were also witnesses of some positive modifications in social welfare system. Several large reforms were carried through in the late 1970s, such as the work environment act and sick-pay programme. These positive modifications were done by thinking the economic backlash due to the oil crisis was considered as a temporary issue. However, the oil crisis in 1973 turned out to be a warning and create a decreasing trend in social welfare expenditures. This decreasing trend was continued until the recent financial crisis of 2007 and the latest data on 2009 showed an increase in both social expenditure areas. Public Family allowances decreased 0.3 point as a percentage of GDP from 1980 to 2009(Bjø01; OEC13f).

Portugal: Portugal had experienced an unsuccessful democracy before the Carnation Revolution of 1974. The first republic was established in 1910 and it lasted in 16 years. Under the republic, there were poorly functioned political institutions and the corruption were widespread. Therefore military coup d'tat ended the First Republic in 1926. In 1928, Portugals military government appointed economist Dr. Antonio Salazar

as Minister of Finance. Economic conditions improved slightly in the 1950s and living standards began to rise. However, the 1960s were crisis years for Portugal starting with the colonial war. In 1968 Salazar became incapacitated in an accident and the Council of State chose Marcello Caetano (from 1968 to 1974) to succeed him. However, Caetano's promises of some reforms fell into indecision. Social tensions were increased due to the absence of opportunities for advancement. In 1974, a group of younger officers abolished the Caetano period. The transition from autocracy to democracy have changed the size and scope of the government. Social welfare spending started to increase after 1974. Considering social protection and access to health care, Portugal is still one of the leading welfare states even though the majority of the growth in social welfare spending has occured after 1974. The share of public social spending is currently higher than the OECD average. It is the second highest country after Japan with 7.5% increases in spending on old-age benefits as a percentage of GDP from 1980 to 2009. Furthermore, the spending on health care was only 0.2% and 3.3% of GDP in 1972 and 1980 respectively. By 2009, it reached a ratio of 7.7% of GDP, where the OECD average accounted for 7.0% of GDP. The increased amount of spending on pensions and health care are much more higher than the other social policy areas Portugal massively expanded the size and the scope of the other expenditure types as well. By 2009, unemployment benefits were four times higher than its level in 1980. Moreover expenditures on family and survivor benefits had tripled compared to their 1980's levels. Although a small rise is occured, family allowances also increased from (1980 to 2009 (0.5% of to 2009 (0.6% of GDP). Democracy has brought an immense change in the state and transformed it into a welfare state from a warfare state(Cas95; OEC13f).

Spain: The transition to democracy in Spain was occured almost at the same period as Portugal. Transition started in the era when the dictatorship was ended and concluded with the completion of the Spanish Constitution of 1978 after the establishment of Constituent Cortes (The Spanish Parliament). Following the new constitution in 1978, massive transformations were made up in social policy areas. The Constitution

acknowledged social protection for all sectors and especially for the most vulnerable *(Art. 39: family and children, Art.48: young people, Art.49: the handicapped, Art. 59: the elderly)*. All social security benefits came under the supervision of the Ministry of Labor and Social Security. In addition, public health and relevant health programs were initiated to be managed by the Ministry of Health and Consumer Affairs. From 1980 to 1993 there was a rapid, permanent increasing trend in total social expenditures. However social expenditures started to fall down after the begining of 1990s due to the global economic crisis. In 1993, the ratio of the total government and mandatory private social expenditures to gross domestic product was 23.1 per cent but it was one of the EU countries that spent a lower proportion of its GDP on social welfare in 1994. A considerable fall permanently continued for many years and could not reach the level of 1993. Another massive fall in total social welfare spending occured in 2001 (19.8% of the GDP) which was explained by the strong GDP growth rate and increasing trend in employment over the last five years. The increase in employment rate reduced the amount of unemployment benefits. Moreover, the reduction in the school-age population in this period kept the education spending at lower level. Similarly, healthcare spending also followed an downturning trend until 2000s after its highest level in 1993. Public spending on family allowances followed a decreasing trend as well. In 2009, Spain was the last country in terms of spending on family allowances among OECD countries. It fell down 0.2% of GDP points from 1980 to 2009(Kaz10; OEC13f).

Sweden: Sweden did not participate to the first world war but the economic crisis of 1921-22 and the American crisis in 1929 caused a recession period in the Swedish economy and it took many years before the economy recover itself. In 1932, therefore, Swedish government decided to apply some economic regulations which control unemployment as the first priority. To control unemployment during the recession periods was the beginning of the policies which afterwards continue with the Swedish Welfare System. The Swedish Welfare Model (1950-1980) aimed at providing higher welfare status to citizens with a social responsibility and it was a typical example which many countries pay attention due to

its specific feature of being a unique combination of a capitalist structure and a social market. As Esping-Andersen describes that it was a social democratic model under capitalism. The system worked well and Sweden was one of the most successful western nations which had high level economic growth from early 1950s to the late 1960s. Between 1960s and 1970s, the economy reached its peak. Despite the golden decades from 1950 to 1970, Sweden started to have problems in the mid 1970s with the global oil crisis. Consequently, a cost crisis occured and Sweden lost its international competitiveness. The cost crisis and the decreasing competitiveness led to several devaluations of the swedish krona in 1980s. The devaluation in 1982 was the reason for sharp increases in Swedish exports and profits. Since 1980, Sweden has started to follow neoliberal welfare policies which were only temporarily useful to keep the economy under control. After the global crisis of the 1990s, the government attacked the welfare state more and more. Total public and mandatory private social spending (as a % of GDP) fell 30.6 percent from 1993 to 2007. Sweden had the highest expenditure level on healthcare as a share of GDP in 1991 but it was the 13th country in healthcare spending in 2007 among OECD-34 countries. Similarly, old-age pensions had a decreasing trend since 1993. Survivor, unemployment benefits and family allowances also follow the similar path(Ber11; OEC13f).

Switzerland: The modern Swiss social welfare system is younger than comparable countries. It was started with the initiation of the old age insurance in 1948. Similar to the United States, the Swiss social welfare system is mainly federal. The federal government is responsible for the major social insurance programs such as old-age pensions and maternity benefits and they are ruled by federal law. The prevention of the poverty and family allowances (payments to families with children) are the responsibility of the cantons rather than federal government. Therefore, cantons and trade unions are also responsible for the social welfare delivery and they share the overall cost together with the federal government. In 2009, the portion of total public and mandatory private social welfare expenditures was 25.4% in gross domestic product. Between 1980 to 1995, the proportion devoted to social welfare services was lower than the other

comparable states and Switzerland was the 15th country in total public and mandatory private social expenditures (as a % of GDP) among OECD countries. In the meantime, however, the level exceeded the OECD average. In 2009, it was the 8th highest country with respect to total public and mandatory private social spending among OECD-34 countries. This increasing trend after mid-1990s mainly relied on the social change with the modernization of the state like changed role of the woman. After the mid-1990s, social welfare services was extended (especially healthcare services) regarding of the important role of women in the society. On the other hand, although until the end of the 1980s Switzerland had virtually zero unemployment, the number of people out of the labor market increased during the seven-year recession period in 1990s. It was another reason of the increasing trend in total social spending, especially in incapacity and unemployment benefits during 1990s, with the idea of supporting people who were out of the labor market. Namely, the long recession during the period of 1991-1996 concluded with the increases in social services in contrast to situation in other OECD countries. Public spending on family allowances has not followed an increasing trend but has not decreased as well. It was following a stable trend from 1980 to 2009(Kaz10; OEC13f).

United States: The United States spends much less on social welfare than most of the other OECD countries when we consider the differences in the amount of social expenditures. In 2009, the United States ranked 26th out of 34 countries in the OECD regarding to public social expenditures. The percentage share of the public social spending in GDP was 19.2 in 2009. Beside the public social welfare expenditures, US is the country with highest gross private social spending among all the other OECD countries (10.5% of GDP in 2009). Especially the increasing number of old-age population and its positive effect on pension programmes largely accounts for an upward trend in private social expenditure which increased 16.7 per cent from 1980 to 2009. Private social health spending and old-age pensions are the main spending items in the US. Among all the other social expenditure categories, total (public and private) health spending is at the top of the list with 14.4 percent of GDP.

Total social expenditures on the old-age benefits has the second greatest range with 11.0% of GDP. In 2009, United States spent only 4.7% of its GDP on the other social policy areas such as unemployment (0.9% of GDP), housing(0.0% of GDP), family(0.7% of GDP), active labor market programmes(0.2% of GDP), incapacity related benefits(2.1% of GDP) and survivor benefits (0.8% of GDP). Public spending on families is really below the OECD average (0.7% of GDP in 2009). One of the reasons for the low level public family spending is the inexistence of a paid maternity leave policy. Amongst OECD-34 countries, US is the only country which has not launched a paid maternity or parental leave. The second important item of the public family spending is the expenditures on family allowances, which was designed to support families with the cost of raising children, was only 0.1% of GDP in 2009 and 0.5% of GDP in 1980(OEC13f).

United Kingdom: In the UK, total social expenditure is above the OECD average (24%), accounting for 30.3 percent of GDP in 2009. The biggest shares are old-age benefits and expenditures on health as is the case with every country in the OECD. The UK is one of the OECD countries paying greater attendance to the private pension system to provide retirement benefits like Australia, Denmark, Mexico, Japan, Korea, Canada, Ireland, New Zealand, Germany, and the United States.The third main spending item is expenditure on families with a propotion as 3.8 percent of GDP. Since 1997 the UK has increased public spending on families very rapidly. However family allowances has followed a decreasing trend after 1985 and after 1990 remain at the same level around 0.8-0.9% of GDP. The forth main social expenditure item is incapacity benefits for people describing themselves as disabled due to a health condition which makes them unable to work. Disability benefits are costing the United Kingdom more than many other countries in OECD. The average social expenditures on incapacity benefits among the 34 OECD members is 2.6 percent of GDP in 2009. The countries which spent more than UK are Sweden(5.7%), Norway(6.4%), the Netherlands(4.2%), Luxembourg(3.6%), Germany(3.5%), Finland(4.8%) and Denmark(5.2%) out of 34 countries. The United Kingdom spent only 6.0% of its GDP to other social policy areas as unemployment (0.7% of GDP), housing(1.5% of

GDP), active labor market programmes(0.3% of GDP),incapacity related benefits(3.4% of GDP) and benefits on survivors(0.1% of GDP)(OEC13f).

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