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The Impact of Public Policy on Fertility Rates in OECD Countries: A Comparative Study

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Abstract: Since the 1980s, fertility rates in OECD countries stayed almost stable at levels below replacement (2.1 children on average per woman), which can have significant feedback effects on the social welfare system. While females still have the desire to form a family, this wish competes with career ambitions, leading to persistently low fertility rates due to the potential incompatibility of family and work. To counter that development, countries implemented a wide range of family policies which aim at facilitating the combination of family and work, especially for females, and the increase of family income. While some countries, especially in Northern Europe, nowadays reach fertility rates around replacement level again, other countries still exhibit levels below replacement. This paper addresses the question whether family policies indeed influence fertility significantly or if other mechanisms are responsible for changes in fertility levels. Using policy and demographic data from 22 OECD countries, the influence of policy packages implemented will be tested in a multivariate regression analysis. The results suggest that policies aiming at facilitating the combination of family and work as well as governmental spending in general have a significantly positive impact on fertility rates, while the extension of the length of leave schemes and family benefits seem to lower fertility.

Keywords: fertility, family policy, OECD

EKHS11
Master Thesis, First Year (15 Credits ECTS)
June 2017
Examiner: Martin Dribe
Supervisor: Maria Stanfors
Word Count: 14,285

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1 Introduction

After the substantial decline of fertility since the 1960s, fertility rates in OECD countries remained almost stable at low levels since the 1980s (Caldwell et al., 2002). These low values of fertility do not only impact on the population's age structure, but also on social welfare systems since the increasing share of elderly needs more financial aid while the support from the working age population decreases.

Fertility rates have dropped as far as below the mark of 2.1 children on average per woman, which is called replacement level fertility. When the total fertility rate (TFR) is at 2.1, the current generation is completely replaced by the subsequent generation and population size and composition is stable, assuming unchanged mortality rates (Gauthier, 2011). Fertility below that level is called low fertility (until TFR is equal to 1.5) or lowest-low fertility (TFR between 1.5 and 1.3). With fertility that low, the dependency ratio, the share of people of working age relative to people outside the work force, will further increase which then aggravates the stress on social welfare systems and economic growth might slow down (Kalwij, 2010).

Why fertility has been declining and stayed at low levels ever since, is highly debated among scholars, but many agree at least on some determinants of this fall. Among these determinants are an increase in female labor force participation, uncertainty in the labor market, delayed age at first marriage and birth due to higher education etc. (Kohler et al., 2002). In this thesis, the focus does not lie on the reasons for the decline, but rather at the political responses to the sustained low levels of fertility.

Since there are feedback effects from declining fertility on the welfare state, social security systems and the economy as such, ways to increase the number of children per woman have become a major policy concern, especially since population ageing advances at an increasing pace.

Political responses focus especially on the compatibility of work and family for women and target fertility only indirectly. The identity of women changed over the last century and career gained importance relatively to family (Goldin, 2014). Women are able to create their own identity before marriage and family formation and invest more in education and training. Thus, family formation competes with career opportunities creating an incompatibility. This double responsibility generates a trade-off between family formation and career when political interventions cannot effectively influence its compatibility.

This trade-off can be illustrated by the fact that in 2011, the mean ultimately intended family size in the OECD was around 2 children, while mean actual family size was at 1.3 children (OECD Family Data Base, 2017). This suggests that there are certain barriers to family formation and policy implementation might be a way to enabling women to achieve their intended family size.

The desire to have a family is still a fundamental part of life satisfaction for many women, but so is the wish to also have a career, in particular for educated women. This conflict is especially evident when it comes to labor market penalties due to a temporary leave of the market as a result of childbearing. Since, differences in earnings start to evolve between men and women at early stages of the career, the decision of leaving the labor market becomes more difficult (Goldin, 2006). Consequently, women might decide to either delay childbearing until later ages or not to have children at all.

Postponement of fertility leads to low period fertility measures, while cohort fertility measures stay stable. In many countries, cohort fertility measures stayed stable at around replacement levels, while period fertility measures like the TFR remained at low values. This indicates that in these countries childbearing is only postponed, but women are still able to realize their desired number of children. When cohort fertility also declines, women are not able to only postpone childbearing, but the postponement leads to lower completed family size. Depending on the possibility of successful delay of childbearing and recovery at later ages, policy measures have to differ.

In general, political action has been slow and there are hardly any major changes in family policies before 1970, even though fertility already started to decline. Following McDonald (2007), this slow response to the demographic changes in society are due to several reasons. First, the phenomenon of low and lowest-low fertility has been considered transitory and it was assumed that the rates will increase naturally. Second, pronatalist policies have been avoided by some countries due to their nationalist past. Lastly, social and family policies are relatively costly and assumed to be mostly ineffective, which also contributed to late action taking in family policies (McDonald, 2007). It is noteworthy that while fertility did not vary much since the 1980s, family policy packages were extended significantly during that period in almost all countries.

Even though the impact of falling fertility is the same among OECD countries, their responses have not been homogeneous and the scope of policy packages implemented

depends largely on the political and social setting and other determinants within society (Craig and Mullan, 2010). Moreover, the implementation of family policies depends on the circumstances at that time. While the implementation of policies was necessary after the industrialization to include more women in the labor force, the female movements in the 1960s and 1970s led to employment of another set of variables due to this social movement. Moreover, demographic changes in societies in more recent years, require again another set of family policies (Olivetti and Petrongolo, 2017).

Nevertheless, the basic measures implemented in the field of family policy are similar and can be defined in three groups: job-protected leaves, payment during job-protected leave and cash benefits or tax breaks for families. Different policy measures also aim at different stages of child care. Maternity leave schemes aim at facilitating childbearing for women providing job security at a diminished wage. Parental leave schemes try to include also males into childrearing and promote gender-equal parenting. Both maternity and parental leave target the transition to parenthood and cover only a limited period of time. But this time is crucial, since childbearing normally takes place at early stages of the career. In contrast to that, childcare leave aims at facilitating work and family when children are older and careers are more advanced. Cash benefits and tax breaks are regularly paid to families and thus, do not have an explicit focus on an age group. Yet, cash benefits and tax breaks might have a different impact depending on the earnings potential of the family.

1.1 Aim

The aim of this thesis is to investigate the scope of different policy measures and their impact on fertility rates in 22 selected OECD countries. More specifically, it will be tested if policies aiming at work-family compatibility have a positive impact on fertility levels or if an increase in income via cash benefits and tax breaks is more effective in impacting on fertility. Moreover, it will be tested if higher governmental spending on family benefits rises fertility levels. Finally, the impact of the whole policy package will be tested for specific age groups to see if policies can impact on postponement of childbearing and its recovery at later ages.

Since this thesis looks at many different countries and different contexts, not the differences between each country will be studied, but rather the differences between country

clusters based on their welfare state regime.

The data used stems from the Comparative Family Policy Data Base and was extended by information from the OECD Data Base, Eurostat and the World Bank. The overall time span under study is from 1986 to 2008.

1.2 Outline of the Thesis

This thesis outlines as follows: First, the background of fertility and family policies in OECD countries will be reviewed. Then, the theoretical framework and previous research will be presented. Section 3 presents the data used and the definition of the variables. Afterwards, the methods will be described. Results are presented and discussed in Sections 5 and 6.

2 Background

2.1 Fertility Rates in OECD Countries

As stated in the introduction, fertility has been declining since the 1960s, but did not show large variations after 1980. On average, TFR fell from 1.96 in 1980 to 1.69 in 2008 in the OECD countries under study. Fertility is measured as the average number of children a woman would have if she lived to the end of her childbearing years and bore children at the prevailing rate for each age during that period (Gauthier, 2011).

Even though fertility rates remained below replacement for almost all countries under study between 1980 and 2008, this development was not homogenous among countries. Figure 1 shows the development in each region in comparison to the average TFR in the OECD. Following Esping-Andersen (1990, cited in Gauthier (2002)), the regions are defined based on their welfare state regime: Social-Democratic (Denmark, Finland, Norway, Sweden), Liberal (Australia, Canada, Japan, New Zealand, UK, US, Switzerland), Conservative (Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands) and Southern-European (Greece, Italy, Spain, Portugal). Depending on the welfare state regime, family policies have a different focus and scope. In the Social-Democratic cluster family policies have almost universal scope and prioritize gender equality, while in Southern-Europe the scope of policies is more fragmented along occupations and coverage is a mix between universal and private services and benefits. The conservative cluster puts the traditional family into focus, whereas the Liberal cluster has the lowest levels of support and assumes that market forces will provide services and benefits if they are needed (Gauthier, 2002). A more detailed description follows in Section 4.

In Figure 1, it becomes clear that there was a shift in the development of fertility in the regions between 1980 and 1990. The Liberal and the Conservative country cluster show least variation and move almost alongside the OECD average. In contrast to that, fertility rates in the Southern-European cluster declined steeply to levels of lowest-low fertility. The Social-Democratic cluster shows most variation, but still exhibiting the highest fertility rates after 1990.

The development for each country is shown in Figure 6 in Appendix A. There, it becomes apparent that the countries within the cluster almost always move alongside except for the Liberal country cluster where differences grew since 1980.

Figure 2 displays the age-specific fertility rates which measure the annual number of births to women of a specified age group per 1,000 women (Human Fertility Data Base, 2017). Here, 5-year age groups have been defined. Figure 2 shows that there has been postponement of family formation in all clusters. Fertility at between 20 and 24 ages declined significantly, while fertility between 30 and 39 experienced a large increase between 1980 and 2008. Mean age at first birth increased from 27.2 in 1980 to 30.2 in 2008 (Gauthier, 2011). Overall fertility in all clusters besides the Southern-European cluster stayed almost stable since women were able to still form a family after they postponed childbearing during their 20s. In the Southern-European countries age-specific fertility rates between 30 and 39 did not increase sufficiently to offset the decline in age-specific fertility between 20 and 29.

Figure 1: Total Fertility Rates between 1980 and 2008 for each Cluster

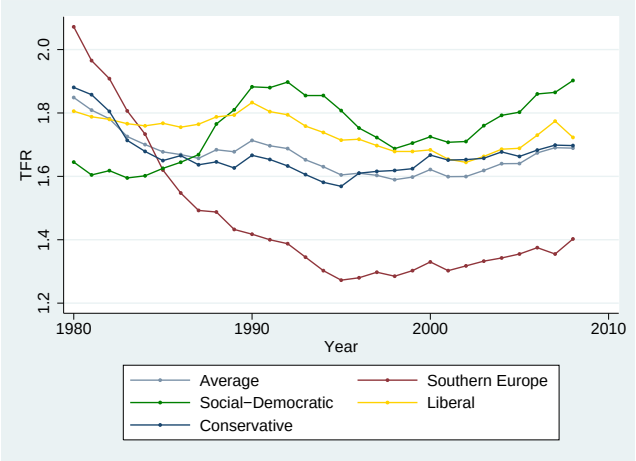
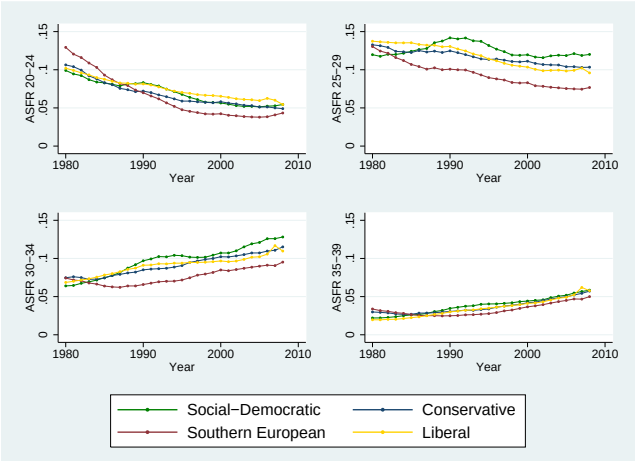


Figure 2: Age-Specific Fertility Rates between 1980 and 2010



2.2 Maternity and Parental Leave in OECD countries

There are different forms of job-protected leave, namely maternity, parental and childcare leave. Maternity and parental leave aim at the time around childbearing, while childcare leave aims at a later stage of a child's life.

Maternity leave schemes have been introduced to protect working mothers. As more women entered the labor market, new regulations needed to be implemented to account for differing needs for female workers (Council of the European Union, 1992). Almost all countries under study have some form of job-protected maternity leave, only Australia, New Zealand and the US do not have any form of national system. All forms of maternity leave in this sample have been implemented before 1970, indicating that maternity leave belongs to the family policy package already longer than the other policy instruments under study. The duration varies between around 40 weeks and 12 weeks. During that time, women receive compensation based on their previous income which varied between 50 and 100 percent of previous income in 2008. This system is financed via the social welfare system on a national level in most countries. Thus, the employer does not have to pay directly for the time the worker is on leave, which takes away the financial burden from the employer and leads to less discrimination for the leave taker (Ray, 2008). Only Canada and Switzerland have a different system, where some provinces or federal states administer their own financial system of leave schemes. One of the reasons why Australia, New Zealand and the United States do not have any form of maternity leave is based on their overall social welfare regime which was explained earlier (Gauthier, 2002).

Parental leave has been implemented later than maternity leave. The reason for the implementation was to achieve a better combination of family and work and to promote more gender-equality in the labor market (Council of the European Union, 2010). The US and Switzerland have no form of parental leave at all, the UK, Australia, Spain, Greece and Ireland offer no financial compensation during parental leave. On the other hand, Sweden and Norway replaced maternity leave with parental leave in 1974 and 1978 leading to a very gender equal system. The longest parental leave is offered in France (with a payment of 82% of the previous wage) and Spain (no payment), with each 156 weeks.

Family policies based on a male-breadwinner model assume that males are the main earners, while women take most responsibilities in the family. That might lead to a larger incentive for women to stay home to take up more family responsibility, a larger penalty

in wages for women and less participation in the labor market. This can go as far as that women decide that there is no possibility to combine family and work and never form a family or leave the labor force permanently (Ray, 2008).

2.3 Childcare Leave in OECD countries

Childcare leave does not target the time around family formation, but rather aims at later stages of a child's life. In this sample, only seven countries have some form of childcare leave in place (Belgium, Denmark, Finland, Luxembourg, Norway, Sweden, US) of which only the US did not offer any payment. Moreover, in comparison to other forms of job-protected leave it has been implemented rather late and even abolished again in Denmark. In some of these countries, parents can stay at home until the child reaches school age. The shortest childcare leave is available in the US (12 weeks) where it is also the only form of job-protected leave and not as in the other countries, complementary to maternity or parental leave. In contrast to that, Finland offers 156 weeks with a payment of about 12% of the previous wage. Luxembourg, Norway and Sweden also offer long childcare leave periods (105, 104 and 78 weeks respectively).

2.4 Cash Benefits and Tax Breaks in OECD countries

Benefits for families do not have a limited availability based on a child's age like job protected leave schemes, but rather provide extra income or tax relief to families. One form of these benefits are allowances paid per child independently from income. In the data set used it is calculated assuming a three-child family and the values are expressed as a share of monthly income (Gauthier, 2002). These benefits vary largely within regions, but followed a similar trend over the period (see Figure 3). Benefits for the first and second child have been increasing in all country clusters. In contrast to that, benefits for the third child stayed almost stable. That shows that the average amount families received increased between 1980 until 2008, while fertility itself stayed almost stable.

Another measure of age-independent financial aid is the value of tax benefits, whose development is displayed in Figure 4. The values are expressed in US Dollars (Gauthier, 2011). It represents the difference in income of a family having two children in comparison to a family without children. In all countries, tax benefits have been increasing, especially in the conservative countries. But even though the average of the regions shows an

increasing path, there are large differences between the countries.

Both findings indicate that while the money a family received increased substantially, there is no direct effect visible in the fertility rate. This might point into the direction that other measures targeting the combination of family and work have a bigger impact than cash benefits.

In this section, it became clear that the countries under study are different in terms of the family policies they have in place and that the extent of each policy package is diverse, while fertility rates converged at low levels. The differences in policy formulation and implementation are shaped by the welfare state regime of the country. To account for the path dependency of countries in social and family policy, the countries will be grouped based on their welfare state regime later.

Figure 3: Average Allowances per Child

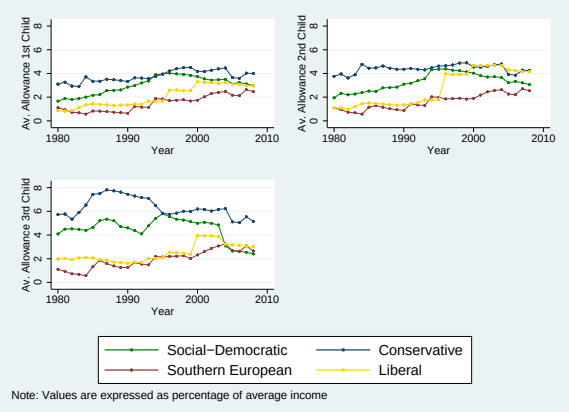
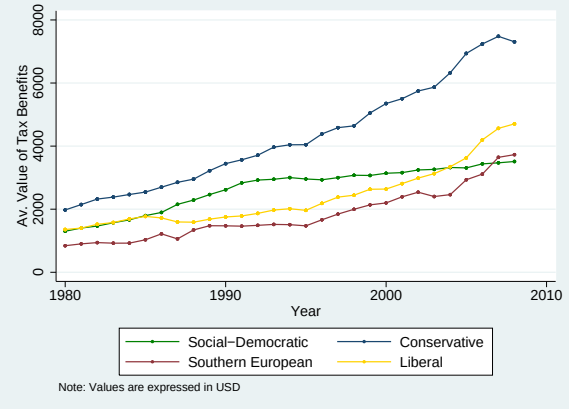


Figure 4: Average Value of Tax Benefits



3 Theory and Previous Research

3.1 Theoretical Approach

There are several theories that try to explain how fertility decisions are formed, but none of these can consistently explain all aspects relevant to it. In the following, the Economic Theory of Fertility mainly based on the work of Becker and its extension by Easterlin will be outlined.

3.1.1 Economic Theory of Fertility

The Economic Theory of Fertility has been mainly developed by Gary S. Becker and assumes that the number of children a family decides to have is determined by prices, income, the ability to produce children, cost of children, preferences and tastes (Becker, 1960). Since childbearing and -rearing are both non-market activities and children are produced at home, parents are both supplier and demander of children in the context of family formation. The production of children requires time and money from their parents. In return, parents get direct and indirect satisfaction from their children (Willis, 1973). If families rely on their own ability to produce children, they might not be able to meet their demand, since children cannot be purchased or traded in a market (Becker, 1991). In this context, it will be assumed that there is no limitation to the supply of children and families are able to meet their own demand.

Following this approach, families are maximizing their utility function which is shaped by the number of children, the expenditure on each child and the quantities of other commodities consumed. This utility function is maximized under a budget constraint that families are facing, which is equal to their total income (Becker, 1991).

The number of children a family has is determined by their production and their cost and the decision to have a child is the same as the decision to buy any other consumer durable. Non-market activities such as child care will be called child services in the following. The production of child services depends on the value of time of the mother, the value of time of the father and the price of market goods, since children and other consumption goods are assumed to compete for resources. Childbearing and -rearing is especially time-intensive and less good-intensive, which makes the value of time of parents one of the most important input factors. As children grow older, they become more good-

intensive and time becomes less important (Hoffman and Averett, 2010).

The most important input factors of child production seem to be direct and indirect costs. Direct costs are for example expenditures on clothes, food etc. Indirect costs of children are defined as the opportunity cost of parents or the value to parents of foregone opportunities in having an additional child (Willis, 1973). Of special importance for indirect costs is the value of parent's time, especially the cost of the mother's time. The growth in earning power of women and the increase in female labor force participation have been identified as a major cause of the decline in fertility. Fathers traditionally spend less time with children and thus, their value of time has been of minor importance over a long period of time (Becker, 1991). The value of time is important when families decide how they allocate their time between market and non-market activities. Assuming that children are more time-intensive than other commodities, an increase in the value of time has a strong negative impact on fertility decisions of a family. To measure the value of time for women, the wage rate can be used. The higher the wage rate, the higher the opportunity costs when having a child (Willis, 1973).

But, as stated before, families maximize their utility under a budget constraint which is equal to the family income. Thus, the increase in the value of time is not only negative for the number of children a family decides to have, but also an increase in the value of time for men and women alike impacts positively on the income of the family, raising the possibilities to childbearing. There are two effects that work alongside. On the one hand, there is the price effect, depressing the number of children due to higher earning potential of parents, and the income effect, increasing theoretically the number of children via more supply of resources that can be spent on children and other consumption goods. Which effect is stronger in the end and thus, if fertility increases, decreases or stays the same, depends on the general setting a family finds itself in (Hoffman and Averett, 2010).

In conclusion, the Economic Theory of Fertility sets the main focus on the cost of parent's time and how this impacts on fertility. An increase in the value of time, especially for mothers, e.g. through more education, would lead to a decrease in fertility due to higher opportunity costs. The income effects coming along with higher value of time is rather small and fertility is likely to decrease. In this model, the value of time and direct costs of children are variables which could potentially be influenced by policy measures.

3.1.2 Easterlin Hypothesis

While Becker and others put their focus on the rational decision making process of family formation, Richard Easterlin also takes the social environment into account when analyzing fertility.

In Easterlins theory, not absolute income, but income relative to income of the parental generation is important in determining fertility (Easterlin, 1987). Easterlin relates potential earning power and the aspirations of a couple to fertility. Decisions on childbearing and family formation are made based on the expected income and standard of living which depends on current income and expectations on the future. These expectations of the future are in turn shaped by labor market conditions, like competition or possibilities, and by the standard of living of the parents which shapes own aspirations for the future (Pampel, 1993). Fertility is higher in a setting where the future income is expected to be higher, because children are easier to finance. How these expectations are formed, depends on the relative cohort size. If the own cohort is relatively large, expected future income is lower due to a more competitive labor market. Consequently, fertility will be lower due to relatively lower wages and standards of living. The opposite holds true if the cohort is relatively small (Easterlin, 1987).

This framework focuses mainly on social determinants of fertility. Relative cohort size as a proxy for relative income is a key determinant of fertility. Policies should aim at increasing the relative income of families in order to lower the burden on families by direct benefits and tax breaks to increase income and to enable families to have the lifestyle aspired while still forming a family.

3.1.3 Summary Remarks

Both theories of Becker and Easterlin focus on the demand for children and what shapes this demand. Both state that income, prices and tastes are the most important determinants.

Generally, policies are not formulated in a vacuum and fit the general scope of social policy implemented. There is no country with a generous social policy framework who does not have a large family policy package in place. Moreover, family policies are rather ideological and proactive, trying to influence a personal and individual decisions and not only reacting to previous societal changes. Ideological in this context refers to the goal of

policy makers to persuade the individual to act like wished, but which ultimately might not be the result of the policy.

Following these theories, public policies can influence fertility via three factors: income, value of time and direct cost of children. Maternity Leave aims at facilitating the combination of family and work at the transition into parenthood. It covers a limited period of time from childbearing to the age of one. These policies aim at reducing opportunity costs due to the necessary absence from the labor market at the very beginning of a child's life. Other forms of job-protected leave like childcare leave aim at later stages of a child's life, even up to schooling age. There the focus lies on the combination of family and work as well, providing job-security and a small payment which lowers opportunity costs and prevents income of falling to significantly lower levels. Moreover, the availability of parental leave promotes a more gender equal way of parenting leading also to a more equal participation in the labor market within the couple. Direct cash benefits or tax deduction work through their effect on income. A higher income is associated with a higher number of children in a family. Direct cash benefits might have a larger impact on families with lower income, while tax deductions have a larger impact on families with higher income.

The tastes of families are more difficult to influence. Following McDonald (2007), due to the decline in fertility and the late action taking in politics, societies became less child-friendly and tastes of families changed in a way that smaller families became the ideal. Policies now would have to try to reverse this trend to escape this circle trying to show ways to combine family and work.

Moreover, the question remains what causes fluctuations in fertility and what differentiates lowest-low fertility countries from low-fertility countries. Following Kohler et al. (2006), the difference is based in demographic and behavioral patterns in the regions with lowest-low fertility. First, childbearing is postponed due to social and economic changes in the country. This postponement effect is enlarged due to social interaction effects leading to a large and persistent postponement transition. These developments are further enhanced by the institutional context. Thus, it seems like tastes are shaped by the socio-economic circumstances and further intensified by the general institutional context leading to the differences observed in the countries of the OECD.

3.2 Previous Research

Research on the impact of policies on fertility have been conducted on both micro and macro level. In this thesis, the impact will be analyzed on the macro level and consequently, the literature reviewed will be on that level as well.[1] Only few studies tried to explain differences in fertility on a national level by comparing countries over a long time period. One problem when comparing countries over time arises because policies are not formulated in an empty space, but depend largely on the context. This makes the identification of causal relationships more difficult. But this cross-national comparison allows the researcher to determine the equilibrium effects of policies considering the multitude of policy instruments and their interdependence (Olivetti and Petrongolo, 2017).

Concerning job-protected leave schemes and its compensation, studies found contradictory results. Adserà (2004) and Castles (2003) found in their studies that the length of maternity leave has no significant impact on fertility. Both took into account over 20 OECD countries, Adserà for a period from 1960 to 1997 and Castles for 1998 in a cross-sectional analysis. D'Addio and D'Ercole (2005) found a negative impact of the duration of parental leave on fertility looking at 16 OECD countries between 1980 and 1999. In contrast to that, Luci-Greulich and Thévenon (2013) and Shim (2014) reached contradictory conclusions using data on 18 and 19 OECD countries. Both studies indicate a significant positive relationship between the length of maternity leave and fertility. This view is partly supported by Rovny (2011), who found that leave generosity for both maternity and parental leave indeed is positive for fertility, but this development in mainly driven by the Nordic countries and France.

But not only the availability of a job-protected leave is an important determinant of fertility rates. Olivetti and Petrongolo (2017) and Shim (2014) agree that it is not enough to have the possibility to take a job-protected leave, but its financial compensation makes it significantly related to fertility. The inconsistent findings, might be due to the different time period each study investigates. The relationship might have changed and while maternity leave was not significantly related to fertility between 1960 and 1980, the relationship might have turned significant in later decades.

Since childcare services and spending on these services, aim at another stage of a child's life, they will be regarded separately here. Castles (2003) identified that the higher

[1] In Table 7 in Appendix A, an overview of previous research and its main findings is presented.

the enrollment in formal childcare increases fertility rates. Olivetti and Petrongolo (2017) found that spending on early childhood education is of special importance to fertility rates. When looking at governmental spending and cash benefits for families, almost all studies agree on their significant positive impact on fertility. D'Addio and D'Ercole (2005), Gauthier and Hatzius (1997) and Luci-Greulich and Thévenon (2013) found that higher transfers and cash benefits significantly increase fertility in OECD countries. Nevertheless, this positive impact is not homogeneous. Gauthier and Hatzius (1997) found large differences concerning the impact of cash benefits given to families within the OECD countries. There is no effect in Anglo-Saxon and conservative countries, whereas the effect is especially important in the Nordics. Gauthier (2002) builds on this results stating that even though spending increased in all countries of the OECD the fertility rates did not converge. Gauthier and Philipov (2008) concluded that increases in governmental spending and cash benefits do not affect the ultimate number of children per woman, but rather their timing. Only Castles (2003) states that there is no impact at all from social expenditure on fertility rates.

Even though labor market conditions will not be taken explicitly into account here, it is important to mention that not only direct policy measures and governmental spending on family policies seems to be important for fertility decisions, but also labor market conditions are crucial for a better combination of family and work. Rovny (2011) found that an active labor market policy is beneficial for family formation, whereas employment protection legislation is not.

The studies mentioned here find different policy measures important for fertility decisions. If a policy measure significantly impacts on fertility depends on the general setting of the particular country and the time period under study.

3.3 Hypotheses

Based on the theoretical remarks and previous findings in research, the following hypotheses are formulated:

1. *Policies aiming at the compatibility of family and work have a positive impact on fertility levels.*

   When the combination of family and work is facilitated, or stated differently, when the opportunity costs of leaving the labor market for a certain period of time are

reduced, fertility will be higher. These policies are maternity or/and parental leave schemes and childcare leave schemes. Moreover, if the job-protected leave is paid adequately, fertility is even more likely to be impacted positively. Gender-equality is also seen as beneficial for fertility because household and childrearing tasks can be shared more easily.

2. *Spending on family policies is positively related to fertility.*

   The more a government spends on family policies (e.g. cash benefits or family services) as a percentage of their GDP, the more facilitated is the decision on childbearing. The more money is spent, the more benefits and services are available for families, which then can rely on this additional help.

3. *Policies aiming at increasing family income are positively associated to fertility.*

   It will be assumed that fertility increases when the income of a family increases. Following the Economic Theory of Fertility, higher income enables families to stem the additional direct and indirect costs of family formation more easily. Thus, the lowered income due to the temporary absence from the labor market does not represent a big obstacle for family formation with sufficient additional income provided by the government independently from income.

4. *Depending on the age of the mother deciding to have a child, different policies are of importance to the decision.*

   Depending on the age of the mother, family formation is facing different obstacles that have to be overcome. For example, for younger couples, higher cash benefits might be more important because direct costs of children restrict childbearing. This might lead to postponement and different obstacles at later ages. For older couples the opportunity costs of leaving the labor market might be higher due to further career advancement. Moreover, extended training and education might be used to first establish a position in the labor market and gain a certain level of security, before family formation even plays a role and family policies could only impact on that by providing higher compatibility of family and work. Hence, depending on age, policies have a different impact on fertility.

4 Data

4.1 Sources

The data used stems from different sources, but is mainly taken from the Comparative Family Policy Data Base (Gauthier, 2011). It consists of two components: The Comparative Family Cash Benefits Database and the Comparative Maternity, Parental, and Childcare Leave and Benefits Database. For the analysis, these datasets have been merged together. The two datasets provide information on family benefits (cash benefits, tax relief for children, length and payment during leave schemes) and other demographic and economic data. Not all variables will be used in this analysis and many of them will not be used in their original form, but have been transformed to fit the purpose of the analysis. Further information about the variables will be provided later in this section.

Information on the total fertility rate has already been included in the Comparative Family Policy Data Base. Age-specific fertility rates have been downloaded from the Human Fertility Data Base (2017). Moreover, data from the OECD Data Base and the World Bank have been used to extent the scope of the data set with economic variables. For West Germany, the data stems from the Eurostat Data Base.

The dataset covers 22 OECD countries over a period from 1986 to 2008 respectively. The 22 countries are the following: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany (only West Germany before 1989), Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States. Data for Germany before 1989 is only available for West Germany. Possible bias resulting from that will be explained in Section 5. Summary Statistics for all relevant variables are displayed in Table 1.

Table 1: Summary Statistics

Variables	Mean	Min.	Max.	Std. Dev.	Obs.
Dependent Variables					
Total Fertility Rate	1.65	1.16	2.44	0.24	506
Age-Specific Fertility Rate 20-24	0.06	0.02	0.12	0.02	495
Age-Specific Fertility Rate 25-29	0.11	0.06	0.17	0.02	495
Age-Specific Fertility Rate 30-34	0.05	0.05	0.14	0.02	495
Age-Specific Fertility Rate 35-39	0.04	0.02	0.10	0.01	495
Leave Schemes					
Length of Leave	56.33	0	172	50.52	506
Availability of Parental Leave	0.73	0	1	0.44	506
Availability of Payment	0.84	0	1	0.37	506
Overall Payment per Parent	41.44	0	102.86	23.92	506
Childcare Services					
Availability of Childcare Leave	0.27	0	1	0.45	506
Payment of Childcare Leave	0.18	0	1	0.38	506
Enrollment in Pre-Primary Education	80.70	27.5	124	20.49	488
Cash Benefits and Tax Breaks					
Gov. Spending on Cash Benefits	1.31	0.10	3.43	0.73	500
Gov. Spending on Services	0.65	0	2.30	0.55	498
Average Allowances	10.45	0	27.76	6.36	492
Value of Tax Benefits	3,268.96	0	12,611.14	2,023.35	506
Controls					
Mean Age at Birth	29.00	26.42	31.24	1.04	495
Relative Cohort Size	2.17	1.43	3.00	0.35	506
Female Labor Force Participation	63.60	34.05	96.50	10.50	506
GDP Growth	0.02	-0.07	0.09	0.02	506
Unemployment	7.13	0.50	24.20	3.84	506
Gender Wage Gap	0.77	0.47	1.12	0.09	506
Employment in Service Sector	66.47	42.94	79.78	7.36	456

Summary Statistics for each cluster can be found in Apendix A.

4.2 Dependent Variables

4.2.1 Total Fertility Rate

Information on the Total Fertility Rate (TFR) has been included in the Comparative Family Policy Data Base (Gauthier, 2011). It is defined as the average number of children a woman would have if she lived to the end of her childbearing years and bore children at the prevailing rate for each age during that period.

It is important to mention that using TFR as a fertility indicator might be problematic. Since TFR is a period measure of fertility, it does not control for parity distribution, duration since the last birth of a women and changes in timing of birth. These factors are important in determining completed fertility and any period measure of fertility will be biased (Sobotka and Lutz, 2010). This bias might lead to wrong conclusions drawn from the introduction of policies. Following Sobotka and Lutz (2010), other measures are

preferable over TFR, but unfortunately, these measures are not widely available and this analysis will still rely on period TFR as a measure of fertility. To at least account for some shortcomings of this measure, mean age at birth will be used as a control variable in the model.

4.2.2 Age-Specific Fertility Rate

Age-specific fertility rates have been downloaded from the Human Fertility Data Base and measure the annual number of births to a woman of a certain age or age group. In order to get a better understanding of the data, women were pooled together in 5-year age groups from 20 to 39. On the Human Fertility Data Base, there were two measures available. One stemming from the Human Fertility Data Base itself and one from the European Demographic Observatory (ODE). Due to a larger availability of countries in the data from the ODE, this source is used. Age-specific fertility rates are taken into account additionally to the total fertility rate because they can provide a better insight in the mechanisms behind the persistent low fertility in the OECD. For instance, they are able to show the postponement of fertility and the potential recovery of fertility at later ages, which is invisible in the TFR.

The data includes all 22 countries under study from a time period of 1986 until 2008. However, there are some years that are not covered for all countries and are missing in the data set, which explains the slightly lower observation numbers for age-specific fertility rates in comparison to the whole data set. Moreover, it will be assumed that individuals between 14 and 19 and over 40, are not influenced in their fertility decisions by public policy. Consequently, these age groups will not be considered in the analysis.

4.3 Policy Measures

Length of Total Leave

For this analysis, it is not important how long each type of job-protected leave is, but rather how much time parents have in total to spend with their children when they are very young. For this, the length of both maternity and parental leave in weeks has been added up to get the full length.

Payment of Leave

To assess the impact of the payment of any form of job-protected leave, several variables are created based on the information available in the data set. First, to see whether the payment as such is important and not the actual value of it, a dummy variable is created which take on the value of 1 when either maternity or parental leave is paid and 0 neither leave is paid.

Maternity leave has been paid in most countries since 1960. Only three countries introduced payment later (Canada, Finland, Switzerland) and three countries never introduced payment at all (Australia, New Zealand, United States). Payment for parental leave has been introduced later, as parental leave as such has been introduced later as well. Parental leave is less often paid, Australia, Greece, Ireland, Spain, Switzerland and the UK do not compensate parental leave. The first countries to introduce paid parental leave were Austria, Italy, Norway and Sweden.

Then, to test whether the amount paid is important for fertility decisions, the amount paid in both maternity leave and parental leave is used. For that the amount paid for maternity leave and the amount paid in parental leave are summed up. To get the average payment per parent during the leave, this amount is divided by two. Payment during leave is defined as cash benefits paid during leave as a percent of female wages in manufacturing.

Gender Equality in Leave Schemes

In the hypotheses, it has been stated that a more gender equal system of leave schemes leads to higher fertility. As a measurement of gender equality, the availability of both maternity and parental leave is used. Thus, a dummy variable has been created which takes on the value of 1 when there is an option for parental leave in addition to or as a replacement of maternity leave and the value of 0 when just maternity leave is available without an option for the father to take job-protected leave.

Availability and Payment of Childcare Leave

Availability of childcare leave is separated from the other two forms of job-protected leave because it aims at another time range of a child's life. While parental and maternity leave aim at the time right after birth, childcare leave rather aims at children above the age of three. A dummy variable is created to measure the availability of childcare leave and the availability of payment during this leave. Over the whole period, only seven countries had some sort of childcare leave (Belgium, Denmark, Finland, Luxembourg, Norway, Sweden, United States).

Payment during childcare leave is defined as cash benefits paid during childcare leave as a percent of female wages in manufacturing.

Enrollment of pre-primary education

The enrollment in pre-primary education is important in this context, since the higher the enrollment, the easier it gets for parents to combine family and work. When a child is enrolled in pre-primary education it means that the parents do not have to spend all their time on children, but outsource part of the responsibility. The variable is defined as total enrollment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year (Gauthier, 2011).

In some years, the value exceeds 100% indicating that this index has been calculated including also under-aged and over-aged children. Moreover, it can be suspected that there are more issues with this index since it is not increasing in all countries, as it would be expected (Gauthier, 2011). Nevertheless, the variable is taken into account due to its special importance and lag of alternatives.

Governmental Spending

There are two variables in the final data set that measure governmental expenditures. The information is taken from the OECD Family Data Base (2017). One of them is spending on family benefits in cash and the other spending in family benefits in services. Both variables available for a time between 1980 and 2010 and all 22 countries are covered. Nevertheless, some countries are not covered over the whole period, which explains the smaller observation numbers in the summary statistic.

Average allowances for children

The original data set contains measurements for monthly family allowances for the first, second, and third child assuming a three-child family. Originally, it is stated in national currency. To be able to compare the values across countries, these variables have been transformed using average monthly earnings. Monthly average earnings are defined as average gross earnings of a production worker in the data base. The original variable is given per year and has been divided by 12 to get monthly earnings (Gauthier, 2011). Allowances per child are expressed as a percentage of these average earnings per month. It is assumed that the higher the earnings of a family are, and thus, the lower the percentage of the allowances is, the less important are direct child benefits, because fixed costs could be stemmed also without the governmental cash transfer more easily. Moreover, because it does not seem important how much a family receive per child, but the overall value they would receive having three children, the three variables are added up to get the total sum of family allowances assuming a three-child family as a percentage of monthly earnings.

Value of Tax benefits

In its original form, the value of tax benefits is defined as the value of tax and benefit transfers of one-earner-two-parent-two-child families is given in national currency and real value per year (Gauthier, 2011). The value was calculated by subtracting the disposable income (after taxes and transfers) of a one-earner-two-parent-two-child family from that of a comparable childless single earner. To be able to compare the countries, information about Purchasing Power Parity (PPP) is used, which is also available in the data set. When transformed with the PPP, the differences between national price levels is eliminated. All values are expressed in national currency relatively to the US Dollar.

When these values are compared across the countries, it becomes clear that Luxembourg spent most on tax benefits for families (average: 7,664 US Dollar). Portugal spent least on average or the time span under study (average: 1,205 US Dollar).

4.4 Control and Mediating Variables

This section presents the control and mediating variables used in the analysis. Because some of the variables have problems with non-stationarity they have been transformed to avoid biases.

Mean Age at First Birth

Data on mean age at first birth is obtained from the Human Fertility Data Base (2017). Again, there were two different measures, one from the Human Fertility Data Base itself and one from the European Demographic Observatory. Data from the ODE will be used, because more countries are covered. The disadvantage is that these values are based on estimates and not on vital statistics. But since their estimation technique is also used by Eurostat, it will be assumed that these estimations are reliable (Sardon, 2017). Data is available between 1986 and 2008, but no country has a time series without missing values. However, this is assumed to be unimportant for the analysis.

Based on Luci-Greulich and Thévenon (2013), mean age at first birth can be used to account for tempo-effect of TFR because it accounts for postponement of childbearing. This variable is not stationary, but no transformation will be made. A transformation (e.g. using the log) would not lead to a reasonable interpretation of the results. Moreover, the variable will not be included when analyzing the age-specific fertility rates since these rates already account for tempo effects by definition.

Relative Cohort Size

Relative cohort size is used as an indicator for relative income. Following Easterlin (1975), the higher the relative income (i.e. the smaller the relative cohort size), the higher the fertility rate. Relative cohort size is calculated by dividing the male population aged 30 to 45 by the male population aged 15 to 29. Data is obtained by the Human Fertility Data Base (2017). Data on population size for West Germany has been taken from Eurostat for a period before 1989 in order to make it coherent with the data from the Comparative Family Policy Data Base (Eurostat, 2017).

Female Labor Force Participation

Female labor force participation is defined as the female civilian labor force as a percentage of the female population age 15 to 64 years. It is used as a control variable since most family policies aim at increasing female labor force participation by making family and work more compatible. Using this variable as a control allows to isolate the effect

of policy from the effect of female labor force participation on fertility. Data stems from the Comparative Family Policy Data Base (Gauthier, 2011). Since the variable is not stationary, its logged form had to be used to avoid spurious regressions.

In all countries, female labor force participation has been increasing over the time under study, in some more than in others. The highest participation rates on average over the period under study has Sweden with 77%, while Italy has the lowest rates (46.3%). The relationship between Female Labor Force Participation and fertility has been considered to be negative, but as it will be explained later, this relationship eventually changed and became positive. Due to this, only the time period where the relationship is positive is taken into account.

Gender Wage Gap

The variable to measure the gender wage gap has been created using three other variables from the Comparative Family Policy Data Base (Gauthier, 2011). Information was available for female and male wages, both defined as hourly wages in manufacturing in national currency. To make them comparable across countries purchasing power parities (PPP) are used, taking the United States as a reference category. Then wages are expressed in US Dollars. Information is available for the whole period under study. To get the pay gap between men and women, the PPP adjusted values of female wages have been divided by the PPP adjusted value of male wages. Since this variable is also non-stationary, the yearly growth rate of the gender wage gap has to be used in the analysis.

Unemployment

Uncertainty in the labor market has been found to negatively impact on fertility. Higher unemployment rates alter the risk of not being re-employed after childbirth and being forced to stay outside the labor market (Gauthier and Hatzius, 1997). But in Adserà (2004), it has also been found that temporary unemployment can be beneficial for fertility since temporary absence from the labor market is necessary anyway. Nevertheless, it will be assumed that unemployment is rather hindering family formation, than fostering it. Here, total unemployment as a percentage share of the total civilian labor force is used.

GDP per capita

GDP per capita is used to account for general economic well-being of the economy. It is assumed that the better the economic outlook for the future (positive GDP growth rates), the less insecurity a couple faces and family formation faces less obstacles. GDP

per capita is expressed in constant 2010 US Dollar and is obtained from The World Bank (2017). Regarding stationarity, also this variable had to be further transformed, so that in the analysis the change of GDP per capita is used by taking the first difference of the logarithm.

Employment in Service Sector

Employment in the Service Sector is expressed as a percentage share of the total civilian labor force and the information is obtained from the OECD Data Base (2017). In general, the service and public sector are more likely to employ women, than for example industrial or manufacturing firms (McDonald, 2006). With a larger service sector, women are more likely to be able to return to the labor force after childbearing, since there are more employment possibilities for them. Due to issues with stationarity, its logged form and the first difference had to be used, transforming the variable in the change in employment in the service sector.

4.5 Country Clusters

Since this thesis takes into account 22 countries, it is clear that there also are large differences between the countries. To control for this heterogeneity, the countries are grouped together based on characteristics of their political system. Esping-Andersen (1990) defined country clusters based on their relationship between market, family and the state. Depending on the relationship between these three, the responsibility of the welfare state differs and with it also policy formulation and who takes up the risk of childbearing.

Esping-Andersen (1990) defines three clusters: Liberal, Conservative and Social- Democratic. The Social-Democratic policy regime is characterized by a high level of equality and universality. The welfare state tries to maximize the independence of the individual from the market. The Conservative policy regime has, in contrast, a rather has traditional understanding of family and the state will only interfere if the family cannot provide for itself anymore. In the Liberal policy regime, there is generally a low level of support for families and the state encourages the market to subsidize the welfare state (Esping-Andersen, 1990). Since the Southern-European countries do not fit in any of those categories they will form their own (Gauthier, 2002). Southern-European policy regimes are highly fragmented along occupational lines and there is a mixture of universal

and private policies and benefits.

The composition of the clusters is taken from Gauthier (2002) and is based on the type of family policy implemented in the late 1980s and early 1990s (see Table 2). Another way of grouping the countries would be based on their geographical location or other national characteristics, which matches closely with the clustering based on their social welfare system.[2] To see if the definition of the cluster impacts on the results, tests have been conducted to see whether there are differences between the two definitions of country clusters, but the differences have been negligible. The results of the regressions with the differing cluster definition can be seen in Table 11 in Appendix B.

Table 2: Country Cluster

Cluster	Countries included
Social-Democratic Policy Regime	Denmark, Finland, Norway, Sweden
Conservative Policy Regime	Austria, Belgium, France, Germany, Ireland, Luxemburg, Netherlands
Southern-European Policy Regime	Greece, Italy, Portugal, Spain
Liberal Policy Regime	Australia, Canada, Japan, New Zealand, Switzerland, United Kingdom, United States

[2]The clusters would be the following: Nordic countries, Continental European Countries, English-Speaking Countries and Japan, and Southern-European Countries. The composition of the cluster only changes for Switzerland (Continental Europe), Ireland (English-Speaking), Japan (English-Speaking).

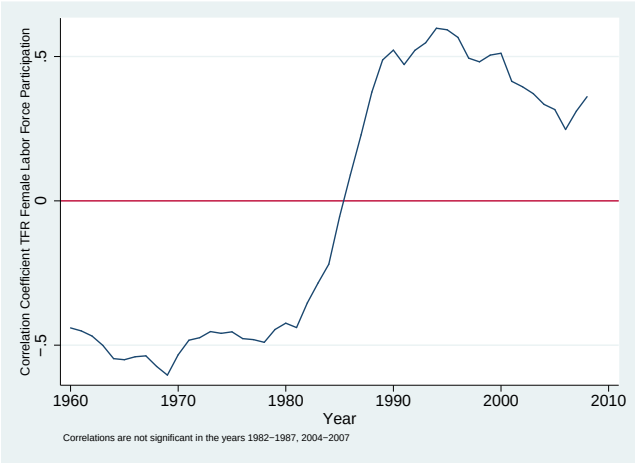
5 Model and Methods

5.1 Model Specification

The relationship between fertility and different policy instruments will be analyzed both in a descriptive and an analytical way. Here, the steps to the final model will be outlined.

First, the time period under study was defined. Following Adserà (2004), the negative relationship between female labor force participation and fertility experienced a reversal, leading to higher fertility in countries with higher female labor force participation. Since family policies aim at increasing female labor force participation while trying to still be able to combine it with family formation, this reversal is important to take into account. In the data set used in this analysis, the correlation considering all countries reversed in 1986 (see Figure 5). To test the sensibility of the regression results, the cut-off has been changed to 1987 and 1989 and the same regressions have been calculated. The results are mostly stable, indicating that the exact point of the cut-off does not seem to matter. Moreover, since policy decisions are taking time to implement and people adjust before implementation to new legislations or policies, the exact point loses significance. Hence, 1986 will be used as a cut-off. The results with the different cut-offs can be seen in Table 12 and Table 13 in Appendix B.

Figure 5: Correlation between TFR and Female Labor Force Participation



The analysis will only consider the years after 1985. The focus of this thesis does not lie on the decline of fertility rates to levels below replacement, but wants to analyze the effect of policies targeting the combination of family and work. Thus, only the period

where higher female labor force participation seems to foster fertility will be analyzed. Moreover, this period has been studies less and the age-specific fertility rates clearly show the postponement of fertility.

The data set has the structure of a balanced panel data set. Thus, different regression techniques can be used to build the model. First, a pooled OLS regression will be performed. But performing an OLS regression with a panel data set has flaws. The cross-section and time dimension are ignored. As a result, unobserved heterogeneity of the different components is likely to bias the results (Gujarati and Porter, 2009). To account for unobserved heterogeneity, it is more efficient to use either a fixed effects or a random effects estimation. Assuming fixed effects in the analysis means that each cluster differs in unobserved characteristics, but that these do not change over time and are not independent from the aspects that can be observed. Random effects on the other hand assumed that these effects are independent from the other aspects observed (Gujarati and Porter, 2009). Intuitively, a fixed effects estimation is more plausible than a random effects estimation. It is likely that unobserved factors like culture, language, norms, values etc., are not independent from the policy measures implemented, since they are customized for the population shaped by these characteristics. Moreover, countries possess a certain path dependency of their social policy depending on the rest of the policy framework. Since the analysis focuses on cluster specific effects, the estimation cannot be evaluated using the Hausman Test (Gujarati and Porter, 2009). Nevertheless, the clustering in regions and including a dummy variable for each cluster already captures some unobserved heterogeneity since it assumes that the countries behave similarly due to their welfare state regime.

Fertility rates are likely to be persistent and changes in policies are not likely to immediately influence fertility decisions (Gauthier and Hatzius, 1997). Thus, the independent variables will be used with one lag behind of the dependent variables. It has been tested if the lag structure has an impact on the results, but the results are similar.[3]

[3]The results can be seen in Table 14 in Appendix B.

5.2 Limitations

Reversed Causality and Simultaneity

The model specification implies that changes in fertility are caused by previous changes in policies. But this assumption is likely to be flawed. Policies are implemented either due to preceding economic change, preceding political and social change or demographic changes in a society (Olivetti and Petrongolo, 2017). As a result, causality might be opposite and changes in policies do not cause changes in fertility, but changes in fertility rates cause governments to adapt. That phenomenon is called reversed causality and leads to the inability to interpret the results obtained as causal. Moreover, it might also be the case that both fertility and policy instruments are caused by another unobserved factor simultaneously and thus, a causal relationship between fertility and policy instruments cannot be established. This problem cannot be solved by estimation techniques and thus, it has to be kept in mind when interpreting the results.

Omitted Variable Bias

This analysis is likely to be biased by omitted variables which are not included explicitly in the model and consequently, enter the error term. Fertility decisions are private decisions and are not only determined by macro determinants included here. Hence, there are aspects of decision making that cannot be included in the analysis, but are essential to childbearing and -rearing decisions. Moreover, since the data is highly aggregated, heterogeneity within the population cannot be taken into account. Thus, the mean effect might be zero due to offsetting effects e.g. at the edges of the income distribution. Considering that, the results obtained might not reflect the whole range of fertility determinants and cannot control for everything influencing TFR.

Heteroskedasticity

It is likely that the variables used in this analysis are heteroskedastic. Heteroskedasticity means that the variance of the error term is not constant, which is one assumption of an unbiased estimator. Consequently, the results obtained in the regressions are inefficient, even though they are unbiased. Regressions results might appear insignificant, even though they would be significant in absence of heteroskedasticity (Gujarati and Porter, 2009). Following Acock (2014), robust standard errors are calculated for all regressions to account for that problem.

Multicollinearity

In the presence of multicollinearity, the regressors are correlated leading to higher standard errors. Thus, the coefficients cannot be interpreted accurately (Gujarati and Porter, 2009). Since some variables measure similar aspects of policies, their values might be biased. To check whether the results obtained in the regression are biased by multicollinearity, Variance Inflation Factors are calculated. Variance Inflation Factors measure to what extent multicollinearity biases the results obtained for each independent variable. If this factor is larger than ten, the results are biased and cannot be interpreted with accuracy (Acock, 2014). In neither of the specifications, the VIF exceeds 10 and thus, multicollinearity does not seem to be a problem in this analysis.

Stationarity

Stationarity means that the variables used have a constant mean, constant variance which is independent from time. If these assumptions are violated, the results of the regression will be biased and it is not possible to establish relationships of the variables over time (Gujarati and Porter, 2009). In order to test whether the variables are stationary, the Pasaran CIPS test is used. This test also accounts for cross-sectional dependence which is likely since the data set only contains OECD countries similar to each other (Baltagi, 2013). All control and mediating variables have been tested for stationarity. There have been problems with female labor force participation, gender pay gap, GDP per capita and the share of employment in service sector. All variables have been transformed until they were stationary and their definition has already been presented in Section 4. Policy variables and mean age at birth have not been transformed even though they were not stationary since their interpretation would lose meaning.

Autocorrelation

The problem of autocorrelation arises due to correlation in the error terms of either within a country or over time. Put differently, one observation depends on the following one, either over time or over space. In this situation, the estimators are still linearly unbiased, but inefficient (Gujarati and Porter, 2009). It might be also a result of non-stationarity and omitted variables in the model. Since the countries under study all belong to the same unit, it is likely that their behavior is dependent on each other, at least in some dimensions. In order to avoid biased results, robust standard errors are calculated as suggested by Acock (2014).

Data on Germany

In the Data Set taken from the Comparative Family Policy Data Base, data on Germany is only available for West Germany and then the Federal Republic of Germany. In what year this changes, depends on the variable. This might lead to large biases in the results, given the fact that East and West Germany exhibited very different evidence on fertility and policies. To account for that, data on Germany was excluded from the analysis to see whether the results behave sensitive to this exclusion. The results are similar to the main analysis and are displayed in Table 15 in Appendix B. Which variables are available for West Germany and the reunited German territory and when the cut-off is set, can be seen in Table 10 in Appendix A.

Taking into account these limitations, the results of the analysis have to be taken with precaution.

5.3 Final Model

Based on these results the final model looks as follows:

$$FertilityIndicator_t = \alpha_{t-1} + \beta_1 PolicyIndicators_{t-1} + \beta_2 Controls_{t-1} + \beta_3 CountryCluster_i + \varepsilon_{t-1}$$

This equation is estimated using an OLS regression and including dummy variables for the country clusters to account for unobserved heterogeneity within the clusters using the conservative welfare state regime as a reference category.[4] The calculated standard errors are robust. The time period under study is 1986 to 2008.

The fertility indicators are the different fertility rates (TFR and ASFR) in their logged form. The independent and control variables are measured with one lag. When the Total Fertility Rate is used as a dependent variable, it is controlled for Mean Age at Birth. Policy indicators and control variables have been explained in Section 4.

Generally, the data used does not allow for causal inference and the estimated effects will be stated in associations.

[4]The analysis is not robust to the choice of the reference category. Using the Conservative country cluster avoids multicollinearity in the model.

6 Empirical Analysis

6.1 Total Fertility Rate

The first step to analyze the data does not include any policy variables to detect the differences between the welfare regimes in general. Table 3, column 1 shows a basic estimation only including the cluster dummy variables, taking the Conservative countries as the reference category. All clusters have the expected sign, indicating that compared to the Conservative countries, Social-Democratic and Liberal countries have higher fertility rates, while in Southern-European countries fertility rates are lower.

In column 2, some control variables which are considered especially important have been added. When adding Female Labor Force Participation, Relative Cohort Size and Mean Age at Birth, the effect among the clusters differs. The coefficients of the Social-Democratic and Southern-European cluster stay significant, but their coefficients are reduced almost by half. The coefficient of the Liberal cluster loses significance indicating that when the regression controls for more determinants of fertility rates, the difference based on the welfare state regime as such turns insignificant.

In the last column, the remaining control variables are added. Only a change in GDP per capita is significantly related to the total fertility rate, indicating that an increase in GDP per capita is associated with an increase in fertility. It is surprising that the other control variables are not significantly influencing the total fertility rate, since they have been found to be related to it in other studies.

The results presented in Table 4 include the relevant policy variables. The first two columns used a pooled OLS regression to estimate the effect of policy instruments on overall fertility.

When control variables are not included, all policy variables are significantly influencing TFR in the following period. With control variables entering the regression equation, some variables lose their significance, indicating that the effect of policies might be mediated by these variables. Moreover, the signs of the variables are not always as expected based on previous findings and theoretical considerations. For example, the availability of payment during job-protected leave and the availability of parental leave are associated negatively with the TFR. The other significant variables, namely governmental spending on family benefits and services, relative cohort size, female labor force participation and

GDP growth all have the expected sign.

Columns 1 and 2 do not take country cluster specific effects into account and treat all observations as if they were from one unit. This might lead to biases in the estimation and to account for that, columns 3 and 4 use country-cluster fixed effects including a dummy for each country cluster and using the conservative countries as a reference category. Consequently, the results change, especially when no control variables are taken into account. Column 4 is the final model used to explain fertility changes due to a prior change in the policy measures.

The first part of the policy package are job-protected leave schemes and their payment. An increase of one week of job-protected leave is associated with a decrease in overall fertility of 0.05%. This results is surprising, since it has been assumed that the longer the time parents can spend with their children, the easier they can combine family and work. It is possible that the effect of skill depreciation outweighs that effect since the average length of maternity and parental leave combined is already 56 weeks.

While the value of payment per parent during leave seems to be irrelevant for fertility decisions, the availability of payment during either maternity of parental leave impacts negatively on fertility rates. If payment is introduced, mean fertility would fall by 8.5%. Again, this result is surprising, because due to the availability of payment income does not fall as much as it would without the payment and the direct costs of childbearing can be stemmed more easily.

The coefficient for the availability of paid parental leave is insignificant. In previous research, it has been found that the availability of parental leave and therefore, a more gender equal system of job-protected leave, is associated with higher fertility. Thus, the results obtained here are against the expectations. It has been checked if the results might be driven by contrary developments due to the large time span under study. But when only looking at the period between 2000 and 2008, the relationship does not change and stays insignificant.

The variables included in the category childcare services do not aim at the time right at family formation, as the variables presented before, but at children aged 3 until they reach school age. When looking at childcare services, only the coefficient of the availability of childcare leave is significantly related to TFR. The availability of childcare leave is associated with an 8% increase in fertility. The availability of payment during that leave

and the enrolment in pre-primary education are only insignificantly related to TFR.

The last part of the policy package are cash benefits and tax breaks for families. Both, governmental spending on cash benefits and services for families, are associated with an increase in overall fertility. An increase in spending of one percent is associated with a 4.5% and 12.5% increase in fertility rates. The impact of a rise in spending on services is larger as a rise in spending on cash benefits for families, signaling that an extension of availability of for example daycare facilities impacts more on fertility than an increase in cash benefits.

Concerning the amount of money a family receives, two measurements are analyzed. The first one is average allowances a family receives as a percentage share of their monthly income. An increase in this variable of one unit is associated with a decrease in fertility of 0.4%. That means that the higher the average allowances, the lower is the fertility rate. However, this might not show the ineffectiveness of policies targeting higher family income, but rather an income effect. If the share of allowances is higher, total income might be lower and theoretically, lower income is associated with less children in the family. Also, the mean income is used and large difference between the two ends of the distribution cancel each other out, potentially leading to this counterintuitive result. Besides the fact that other mechanisms than the policy itself drives the negative impact, the coefficients are very small. The second variable concerning the income of families, is the value of tax benefits. Even though the coefficient is significantly related to TFR, the coefficient is equal to zero when rounded to four decimals. That indicates that even though there is a positive relationship between the two variables, the effect is negligible. This small effect can be partially explained by the income distribution. Tax breaks only impact on families with higher income, but there are less families with high income than there are with lower income. The effect might be cancelled out because the median income is used in the analysis.

In Model 4, dummy variables for the different country clusters have been included to account for unobserved heterogeneity among the countries and to separate the policy effect from the effect of the general welfare state regime. In comparison to the Conservative countries in the study, the Social-Democratic countries, have a median fertility rate which is 15.3% lower. The countries belonging to Southern-Europe have a median fertility which is 14.5% lower than in the Conservative countries. There is no significant difference

between the Liberal and the Conservative country cluster. These results partially differ from the ones in the basic model presented earlier. When all policy and control variables are taken into account, the dummy variables measure the difference between the general welfare regime. Thus, it is not as surprising as it may seem that the coefficient for the Social-Democratic dummy is negative.

When looking at the control variables, only some are significantly related to TFR. Changes in the gender pay gap, unemployment and the change in employment in the service sector do not seem to impact significantly on fertility decisions. In contrast to that, relative income impacts significantly negative on TFR. An increase of one unit in relative cohort size is associated with a decrease of 16.6% in TFR. This coefficient decreased compared to the basic model, indicating that part of the effect of relative income is now absorbed by the policy variables in the model. On the other hand, female labor force participation and GDP growth per capita are positively associated with TFR.

Table 3: Basic Model

	(1) Log TFR	(2) Log TFR	(3) Log TFR
Social-Democratic Cluster	0.0929***	0.0459***	0.0453***
	(0.000)	(0.001)	(0.004)
Southern-European Cluster	-0.1869***	-0.1912***	-0.1830***
	(0.000)	(0.000)	(0.000)
Liberal Cluster	0.0493***	0.0030	0.0262
	(0.002)	(0.833)	(0.110)
Mean Age at Birth		0.0161***	0.0177***
		(0.009)	(0.004)
Relative Cohort Size		-0.2185***	-0.2257***
		(0.000)	(0.000)
Log Female Labor Force Participation		0.2681***	0.2938***
		(0.000)	(0.000)
GDP Growth			0.4188*
			(0.085)
Change in Gender Wage Gap			-0.0262
			(0.910)
Unemployment			-0.0020
			(0.248)
Change in Employment in Service Sector			0.0468
			(0.883)
Constant	0.4877***	-0.5939***	-0.7281***
	(0.000)	(0.006)	(0.003)
Observations	484	479	414
R^2	0.388	0.532	0.591
Adjusted R^2	0.384	0.526	0.581

p-values in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Independent Variables are measured in t-1

Reference Category for Country Cluster: Conservative Countries

Table 4: Comparison OLS and Country Cluster Fixed Effects

	(1)	(2)	(3)	(4)
Dep. Variable: Log TFR	OLS	OLS	Fixed Effects	Fixed Effects
Length of Leave	-0.0005***	-0.0003	-0.0006***	-0.0005***
	(0.002)	(0.106)	(0.000)	(0.001)
Overall Payment per Parent	0.0010**	0.0002	0.0005	0.0002
	(0.023)	(0.705)	(0.137)	(0.584)
Availability of Payment	-0.1007***	-0.0931***	-0.0717***	-0.0816***
	(0.000)	(0.000)	(0.000)	(0.000)
Availability of Parental Leave	-0.0861***	-0.0985***	0.0110	-0.0138
	(0.000)	(0.000)	(0.447)	(0.330)
Availability of Childcare Leave	0.0537***	0.0233	0.1040***	0.0771***
	(0.003)	(0.231)	(0.000)	(0.000)
Payment of Childcare Leave	-0.0361*	0.0184	-0.0154	0.0188
	(0.061)	(0.350)	(0.420)	(0.335)
Enrollment in Pre-Primary Education	0.0005*	0.0006**	0.0001	0.0002
	(0.068)	(0.026)	(0.702)	(0.530)
Gov. Spending on Cash Benefits	0.0795***	0.0442***	0.0762***	0.0449***
	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Services	0.1062***	0.0904***	0.1322***	0.1253***
	(0.000)	(0.000)	(0.000)	(0.000)
Average Allowances	-0.0038***	-0.0007	-0.0086***	-0.0044***
	(0.001)	(0.538)	(0.000)	(0.001)
Value of Tax Benefits	-0.0000***	-0.0000	-0.0000***	-0.0000***
	(0.000)	(0.659)	(0.000)	(0.005)
Social-Democratic Cluster			-0.1969***	-0.1534***
			(0.000)	(0.000)
Southern-European Cluster			-0.1907***	-0.1451***
			(0.000)	(0.000)
Liberal Cluster			-0.0387*	-0.0197
			(0.076)	(0.482)
Mean Age at Birth	-0.0199***	0.0013	-0.0098*	0.0087
	(0.003)	(0.853)	(0.100)	(0.225)
Relative Cohort Size		-0.1661***		-0.1659***
		(0.000)		(0.000)
Log Female Labor Force Participation		0.2905***		0.1958***
		(0.000)		(0.000)
GDP Growth		0.4277**		0.3716*
		(0.036)		(0.053)
Change in Gender Wage Gap		0.2175		0.0544
		(0.118)		(0.748)
Unemployment		-0.0020		-0.0004
		(0.166)		(0.789)
Change in Employment in Service Sector		0.0367		0.1609
		(0.874)		(0.474)
Constant	1.0495***	-0.3964	0.8741***	-0.1605
	(0.000)	(0.105)	(0.000)	(0.536)
Observations	439	381	439	381
R^2	0.580	0.723	0.696	0.775
Adjusted R^2	0.568	0.709	0.685	0.762

p-values in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Conservative Countries

6.2 Age-Specific Fertility Rates

The age-specific fertility rates are used to determine if the same policy instrument has the same impact on each age group. Moreover, it will be looked for evidence of postponement of family formation, which will be signaled by lower fertility rates in between 20 and 29 and higher fertility rates between 30 and 39. The results are displayed in Table 5.

The length of job-protected leave around family formation is significantly negative related to the age-specific fertility rates between 20 and 29. An increase of one week is associated with a decrease of the fertility rate by 0.1% and 0.8%, respectively. For the older age groups an extended leave is not significantly associated with fertility rates. The overall payment per parent impacts negatively only on fertility at ages 25 to 29, while the availability of payment impacts negatively on fertility between 20 and 24 and fertility between 35 and 39. The effect of the availability of payment is larger than the effect of the value of these payments (-0.8% compared to 22.8% and 10.5%). The other age categories do not seem to be influenced by a change in policy concerning length and payment of job-protected leave.

The availability of childcare leave and its payment yield different results compared to the previous model. The availability of childcare leave is only positive for fertility between 20 and 29, while the other age groups are not influenced by a change in that variable. The effect is five times larger for women between 20 and 24 (15.2% compared to 3.2%). But this positive effect is almost offset if this childcare leave is paid for women between 20 and 24. The introduction of payment for childcare leave is associated with a decrease in age-specific fertility of 11.1%. While the availability of childcare leave did not impact on fertility rates for women in their 30s, there is an effect for women aged between 30 and 34. That indicates that for women who have their children at their early 30s, the availability is not enough to incentivize family formation, but a financial compensation is needed to impact significantly on fertility rates.

There is a clear postponement effect when looking at the enrolment rates in pre-primary education. Pre-primary education has been assumed to be positive for family formation because women can return to the labor force more easily if their children are taken care of in daycare facilities. In the results, it becomes clear that an increase in enrolment rates lead to lower fertility during the 20s (between 0.6% and 0.1%) and higher fertility during the 30s (0.4% and 0.6%). That indicates that females delay their child-

bearing even though there is a higher possibility to give responsibility of childcare away to the pre-primary school.

Governmental spending on cash benefits and services for families is positively related to age-specific fertility rates in almost all age groups. If the coefficient is significant, the association between fertility and governmental spending is positive, as it was expected. The effect of a one percent increase in governmental spending is associated with an increase in fertility between 4.1% and 17.6%, depending of the age group and area of spending. In general, the effect of an increase in governmental spending on services is associated with a larger increase in fertility than an increase in spending on cash benefits. Moreover, this effect is largest for women in their late 30s. Surprisingly, the effect of governmental spending on women between 25 and 29 is insignificant for cash benefits, while the coefficient for spending on services is comparably large. That might indicate that for women in their late 20s, a larger availability of services is more important than higher cash benefits.

Since spending on cash benefits seems to be positive for fertility rates, it would be logical to expect also average allowances to be positive for childbearing decisions. But the results indicate that an increase in average allowances is negatively associated with fertility, at least for women aged between 30 and 39. As stated, this results might be biased due to the variable definition and might mix the policy effect with a general income effect.

When looking at the country cluster and the differences depending on the welfare state regime, it becomes clear that the separate age groups behave differently from the overall effect found in the previous analysis. Fertility in the Social-Democratic cluster is significantly lower than in Conservative cluster, at least in the 20s. The differences between the clusters for women between 30 and 39 are insignificant. In the Southern-European cluster fertility rates are significantly lower in all categories besides for women in their late 30s. Their mean fertility is 19.7% higher compared to the Conservative cluster, indicating that there is a larger postponement in Southern Europe, but that there is also a larger recovery at older ages. The same holds for the liberal countries. Mean fertility in the 20s is 30.9% and 11.7% lower, but is 14.9% and 24.9% higher for women between 30 and 39.

Furthermore, postponement effects are visible in some of the control variables. If the relative cohort size increases and thus, if relative income decreases, fertility rates fall during the 20s and increase during the 30s. This result was expected since due to a higher

relative cohort size, there is for example more competition at the labor market and young women try to establish their career prior to family formation to gain more security. The same postponement effect can be seen in GDP growth and unemployment. An increase in GDP growth improves the prospects for the future and younger women might try to advance their career further before they form a family, while older women use the positive signs to assure their return to the labor market after childbearing. If unemployment increases, there is a larger insecurity and fertility decreases at younger ages, while fertility at older ages increases. For women already established in the labor market, temporary absence from the labor market can be used to bypass the worse conditions and return to the market after childbearing when the prospects might be better.

A change in female labor force participation yields different results depending on the age group. While an increase in female labor force participation of one percent is associated with higher fertility for young women and women in their 30s, fertility is expected to decrease for women aged between 25 and 29 (-9.2%). Higher female labor force participation incentivizes women to also be more involved in the labor market and family formation is postponed to later ages, when careers are more advanced.

Table 5: Country Cluster Fixed Effects with Age-Specific Fertility Rates

	(1) Log ASFR 20-24	(2) Log ASFR 25-29	(3) Log ASFR 30-34	(4) Log ASFR 35-39
Length of Leave	-0.0011***	-0.0008***	-0.0001	-0.0002
	(0.004)	(0.000)	(0.522)	(0.510)
Overall Payment per Parent	-0.0003	-0.0008**	0.0001	0.0018
	(0.730)	(0.010)	(0.856)	(0.120)
Availability of Payment	-0.2281***	0.0246	0.0407	-0.1053**
	(0.000)	(0.223)	(0.206)	(0.048)
Availability of Parental Leave	-0.0234	0.0441**	0.0250	0.0158
	(0.626)	(0.027)	(0.359)	(0.717)
Availability of Childcare Leave	0.1417***	0.0318*	0.0256	0.0756
	(0.002)	(0.058)	(0.474)	(0.187)
Payment of Childcare Leave	-0.1050***	0.1200***	0.1070***	-0.0286
	(0.005)	(0.000)	(0.000)	(0.545)
Enrollment in Pre-Primary Education	-0.0059***	-0.0013***	0.0044***	0.0059***
	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0409*	-0.0053	0.0755***	0.1738***
	(0.092)	(0.597)	(0.000)	(0.000)
Gov. Spending on Services	0.0916***	0.1571***	0.1353***	0.1762***
	(0.010)	(0.000)	(0.000)	(0.000)
Average Allowances	0.0019	0.0008	-0.0108***	-0.0142***
	(0.503)	(0.598)	(0.000)	(0.000)
Value of Tax Benefits	0.0000	-0.0000*	-0.0000***	-0.0000***
	(0.150)	(0.058)	(0.000)	(0.000)
Social-Democratic Cluster	-0.2768***	-0.1534***	-0.0684	-0.0823
	(0.000)	(0.000)	(0.130)	(0.276)
Southern-European Cluster	-0.2811***	-0.3599***	-0.0820*	0.1797***
	(0.000)	(0.000)	(0.060)	(0.009)
Liberal Cluster	-0.2695***	-0.1108***	0.1386***	0.2193***
	(0.000)	(0.000)	(0.001)	(0.001)
Relative Cohort Size	-0.4929***	-0.3454***	0.1170***	0.4113***
	(0.000)	(0.000)	(0.001)	(0.000)
Log Female Labor Force Participation	0.2430*	-0.0918*	0.1874***	0.3284***
	(0.052)	(0.095)	(0.008)	(0.003)
GDP Growth	-1.3771***	-0.5841**	1.4522***	3.1233***
	(0.009)	(0.013)	(0.000)	(0.000)
Change in Gender Wage Gap	-0.3835	-0.1035	0.1853	0.3798
	(0.415)	(0.601)	(0.327)	(0.207)
Unemployment	-0.0138***	-0.0043**	0.0092***	0.0204***
	(0.000)	(0.025)	(0.000)	(0.000)
Change in Employment in Service Sector	0.7513	-0.1311	-0.3508	-0.0182
	(0.174)	(0.709)	(0.366)	(0.974)
Constant	-1.8806***	-0.8929***	-3.9305***	-6.4028***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	375	375	375	375
R^2	0.655	0.807	0.618	0.555
Adjusted R^2	0.636	0.796	0.597	0.530

p-values in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Conservative Countries

6.3 Discussion

To put the regression results into perspective, a change in policy will be analyzed in the year 2008 using the predicted probabilities of the regression. The average total fertility rate in 2008 was 1.689 children per women. Table 6 shows the increase in the number of children born if the policy measure would increase by 25 % in the respective unit or would be introduced by a larger share of countries. The results suggest that even such a large increase in policies does not have an equally large impact on fertility. The largest increase in overall fertility would be achieved by an increase in female labor force participation, which is one of the main goals of family policy as well. If in 2008, female labor force participation would have risen by 25%, fertility would have increased by 0.342 children per women. The other effects range between -0.01 and +0.034. Nevertheless, if all significant family policies would rise simultaneously by 25% the impact would be sufficient to rise fertility from low levels to replacement. Yet, these large increases are not very likely due to their high cost or their lack of practicability.

Table 6: Effect of Increase in Policies on TFR in 2008

Policy Variable	Mean in 2008	Value of Increase	Effect	Change in Fertility	TFR
Length of Leave	56.335	14.084	-0.007	-0.012	1.682
Availability of Payment	0.8479	0.153	-0.012	-0.021	1.668
Availability of Childcare Leave	0.2747	0.220	0.017	0.029	1.706
Gov. Spending on Cash Benefits	1.312	0.328	0.015	0.025	1.714
Gov. Spending on Services	0.647	0.162	0.020	0.034	1.723
Average Allowances	10.449	2.612	-0.011	-0.019	1.678
Female Labor Force Participation	4.138	1.035	0.203	0.342	1.892
GDP Growth	0.021	0.005	0.002	0.003	1.692

Availability of Payment during Leave: Increase of 18% is assumed which is equal to the introduction by all countries
Availability of Childcare Leave: Increase of 80% is assumed which is equal to the introduction by half of the countries
For the other variables an increase of 25% is assumed.

Unfortunately, the interpretation of the results is limited due to tempo-effects in fertility and other possible biases, which have been mentioned before. These limitations might also explain some of the differences to other studies. Other differences can be attributed to the different policy indicators used, different definitions of policy measures and different scope of time and space.

The results of this thesis concerning the facilitation of the combination of family and work show that an increase of job-protected maternity and parental leave impacts negatively on fertility, especially for women aged between 20 and 29. Shim (2014) in contrast

found a positive impact on fertility, but also stated that payment is especially important. Gauthier and Hatzius (1997) did not find any effect and attribute that to the little variation in the data used. In this data set, there is also very little variation and the overall length has mostly been stable over the period under study. When an earlier time period would be taken into account, the effect might thus be different.

Unexpectedly, the availability of parental leave is only significantly related to fertility between 25 and 29. It was assumed that the availability of parental leave leads to a more gender-equal parenting and helping to combine family and work more easily. Even when only the most recent years are considered, this relationship stays insignificant. To investigate this issue further it would be interesting to also take into account take-up rates, since the impact of a new policy will be smaller if parents take no advantage of it.

At later ages of a child's life, job-protected childcare leave helps to secure the job position when the child is a little bit older. This thesis concurs with Castles (2003), D'Addio and D'Ercole (2005), Luci-Greulich and Thévenon (2013) and Shim (2014), who all found a positive relationship between the availability of childcare leave and fertility levels. Shim (2014) also states that payment is important to have a significant impact on fertility. This finding can be supported by this theory. When payment is available, childbearing is still delayed in early 20s, but increases in late 20s and early 30s. The same holds for enrollment in pre-primary education. Higher enrollment rates lead to lower fertility in the 20s and recovery of fertility in the 30s.

This thesis has been unable to detect an income effect on childbearing as described in the literature and previous research. The effect of an increase of average allowances has been found to be negative for both overall and age-specific fertility rates. This contrasts with Gauthier and Philipov (2008) who found that there is at least a short-term effect when couples get incentivized by higher allowances to advance family formation. The negative finding here might be due to the definition as a percentage share of earnings and it would be interesting to measure them independently from monthly income and compare the effects.

The results concerning governmental spending on family cash benefits and services match with those in earlier studies like Adserà (2004), Luci-Greulich and Thévenon (2013) and Rovny (2011). All studies found a positive impact of governmental spending on fertility levels, indicating that even though family policies are rather ideological a higher

spending leads to some impact on family formation.

Postponement of fertility can be seen clearly in the control variables used. Relative Cohort Size has not received much attention in previous research, but the results are in line with the theoretical framework on which this thesis builds on. Unemployment has received most attention in previous literature and is mostly used as a proxy for insecurity. In this thesis, an increase in unemployment is associated with lower fertility in 20s and higher fertility in 30s. These findings match those in Adserà (2004) who states that temporary unemployment can be regarded as a cheap time to have children, especially when the career is more advanced. On the other hand, for younger women who use this temporary unemployment for childbearing, the absence from the labor market will lead to weaker attachment to it and decreases in earning potential.

Some of the coefficients of the country cluster variables might look surprising at first sight, but can be explained by the model. In general, the Social-Democratic country cluster had higher fertility rates than the other cluster in the study. But when accounting for all different policy measures, the results suggest lower fertility rates in the Social-Democratic cluster when compared to the Conservative cluster. This suggests that the countries of the Conservative cluster can make up for not having such an extensive family policy package due to other social forces of the society. Moreover, women in the Social-Democratic cluster are able to recover from their lower fertility in their 20s and have more children during their 30s, compared to the Conservative country cluster. This recovery can also be seen in the Liberal and the Southern-European country cluster. Nevertheless, the sustained low fertility rates in the Southern-European cluster cannot be offset by the recovery in the late 30s.

7 Conclusion

This thesis set out to assess the impact of family policies on fertility in 22 OECD countries between 1986 and 2008. More specifically, the focus was set on policies aiming at facilitating of the combination of family and work and increasing family income. Both total fertility rate and age-specific fertility rates were considered to also see whether policies have differing impact on women depending on their age.

Since family policies do not directly aim at increasing fertility, higher fertility can be considered a by-product of these policies. Nevertheless, even small increases in fertility would have beneficial effects on the social welfare system through their effect on population structure.

This thesis has shown that extending the availability of childcare leave and spending on family services like childcare facilities impact significantly on fertility, whereas further increases in the length of job-protected leave or increases in payment during the leave seem not to foster fertility. The relevance of absolute income cannot be confirmed by this study since both indicators have been found to be negative. However, lower relative income is associated with postponement of fertility. The same holds for unemployment and GDP growth, indicating that security is an important factor for fertility decisions.

Yet, the rather small impact of changes in the family policy package found in this thesis should not be taken as evidence for ineffectiveness of policy intervention. Family policies are rather ideological trying to influence a personal decision and thus, their effect does not have to be large. Moreover, governmental spending on family benefits and services has been found to be positive for both overall and age-specific fertility.

Further research is required to get a better understanding how policy interventions impact on fertility decisions and what other factors shape family formation. Using either individual-level data or more specific data in each country could shed light on other determinants of childbearing, which cannot be taken into account in a cross-national study. Moreover, factors like labor market conditions and flexible work arrangements would contribute to the facilitation of the combination of family and work and hence, it would be interesting to assess the effect of these factors more explicitly.

An implication of the findings of this thesis is that not only one policy instrument can increase fertility, but rather a comprehensive set of policies is needed which support families not only through childbearing, but also through later stages of a child's life.

Moreover, the policy framework is dependent on the circumstances of each country, like the general setting of the welfare state. Family policies are dependent on the prevailing policy regime and thus, generous family policy is likely to be associated with other generous social policy instruments. Moreover, the needs of parents and children are heterogenous, not only between countries, but also between groups within the country. Thus, there cannot be a universal solution of all countries and policies will not have the same impact in every setting.

It is likely that fertility rates will continue to fluctuate at levels of low fertility in many countries since the tendency of postponing childbearing persists. Policy makers should therefore focus on policies which enable couples to be able to reach their intended family size even though childbearing was delayed to higher ages.

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Appendix A: Descriptives

Figure 6: Development of TFR in Welfare State Regime Clusters

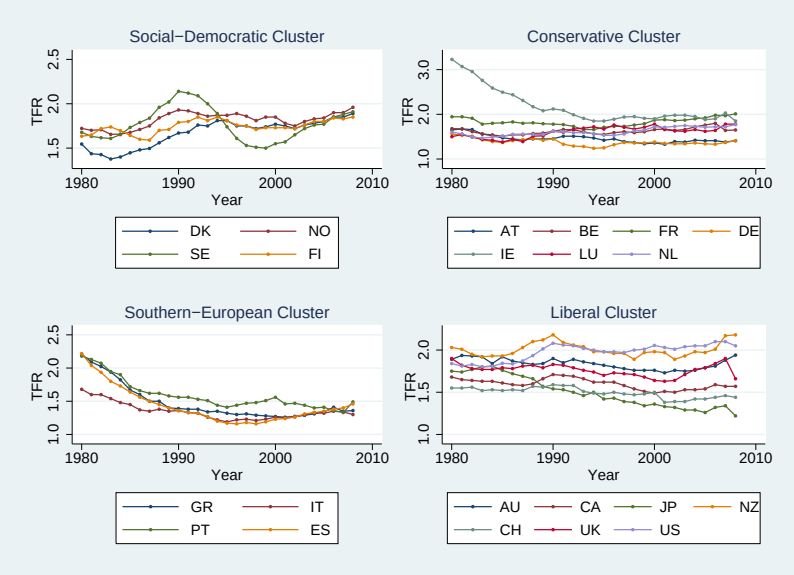

Table 7: Overview over Previous Research

Countries and time included	Author	Source	Method	Dependent Variable	Policy Variable	Findings
23 OECD countries, 1960-1997	Adserà (2004)	Official OECD Statistics	Panel regression with country and year specific effects	TFR and ASFR	Length of Maternity Leave and replacement rate of maternity leave	No significant relationship of weeks of maternity leave and TFR or ASFR
21 OECD countries in 1998	Castles (2003)	Official OECD Statistics	Correlations and regressions	TFR	Proportion of children using child-care arrangements, maternity/childcare leave, social expenditure on families, flexible workplace arrangements	Proportion of children using formal childcare services seems especially important
19 OECD countries, 1980-1999	D'Addio, A. C., & d'Ercole, M. M. (2005)	Official OECD Statistics	Dynamic Panel Model	TFR	Tax benefits and cash transfers, childcare provision, maternity and parental leave	Length of maternity leave affects fertility negatively, higher transfers increase fertility rates
22 OECD countries, 1970-1996	Gauthier & Hatzius (1997)	Official OECD Statistics	Pooled cross-national and time-series regression	TFR	Family Cash Benefits	Positive Effect of Cash Benefits on fertility, especially in Nordic countries
European countries	Gauthier & Philipov (2008)	various sources	Clustering of countries and linking cross-national differences to to economic, social and institutional differences	TFR, temo-adjusted TFR, Desired and realized fertility	Financial Support for families, Work- and Gender-related policies , other institutional barriers	Financial benefits rather affect timing of births; combination of broader societal norms and institutions matters for fertility decisions

Table 7 - continued: Overview Previous Research

Countries and time included	Author	Source	Method	Dependaent Variable	Policy Variable	Findings
18 OECD countries, 1982-2007	Luci-Greulich & Thévenon (2013)	Official OECD Statistics	Two-way fixed effects estimation model with contry and time fixed effects	TFR	Spending per birth, spending on cash benefits, spending on childcare services, number of paid weeks, childcare enrollment	each variable has positive impact, but some measures seem to be more important than others
15 OECD countries, 1970-2010	Olivetti & Petrongolo (2017)	Official OECD Statistics	Correlations and Regressions	TFR	Total paid leave, average payment, spending on childhood education and care	Availability of maternity/parental leave is not enough, payment it important; spending on early childhood education raises fertility significantly
22 OECD countries, 1972-1999	Gauthier (2002)	Official OECD Statistics	Comparison of trends in regions in Europe	TFR	Indirect and direct cash benefits and support for working parents	Divergence in trends even though spending increased in all countries
17 OECD countries, 1990-1999	Rovny (2011)	Official OECD Statistics, World Bank Data	Pooled Time Series Analysis	TFR	Active Labor Market Policy, Daycare Spending, Leave Generosity, Type of Welfare Regime	Active Labor Market Policy (positive) and Employment Protection Legislation (negative) have large impact; Daycare spending and Leave generosity are positively related but driven by Nordic countries and France
19 OECD countries, 1969-2010	Shim (2014)	Several sources	OLS regression with country and year fixed effects	TFR	weeks of leave (paid and unpaid), cash allowances, maternity and parental leave, family services, childcare enrollment	Job-protected Leave increases fertility rates, while unpaid leave does not have an effect

Table 8: Summary Statistics for Social-Democratic and Conservative Welfare State Regime

	Social-Democratic Cluster					*Conservative Cluster*				
Variables	Mean	Min.	Max.	Std. Dev.	Obs.	Mean	Min.	Max.	Std. Dev.	Obs.
Dependent Variables										
Total Fertility Rate	1.78	1.58	2.14	0.13	92	1.64	1.24	2.44	0.22	161
Age-Specific Fertility Rate 20-24	0.06	0.04	0.10	0.01	92	0.06	0.04	0.10	0.01	161
Age-Specific Fertility Rate 25-29	0.13	0.10	0.16	0.01	92	0.11	0.08	0.15	0.02	161
Age-Specific Fertility Rate 30-34	0.11	0.07	0.13	0.01	92	0.10	0.05	0.14	0.02	161
Age-Specific Fertility Rate 35-39	0.04	0.02	0.06	0.01	92	0.04	0.02	0.10	0.02	161
Leave Schemes										
Length of Leave	47.95	18	68.57	14.61	92	82.60	12	172	59.52	161
Overall Payment per Parent	54.48	31	90	17.50	92	55.60	15.28	25	102.86	161
Availability of Payment	1	1	1	0	92	1	1	1	0 161	
Availability of Parental Leave	1	1	1	0	92	0.75	0	1	0.44	161
Childcare Services										
Availability of Childcare Leave	0.86	0	1	0.35	92	0.27	0	1	0.44	161
Payment of Childcare Leave	0.49	0	1	0.50	92	0.27	0	1	0.45	161
Enrollment in Pre-Primary Education	74.93	29	105.50	20.44	92	96.40	70	121	13.13	143
Cash Benefits and Tax Breaks										
Gov. Spending on Cash Benefits	1.70	0.85	2.97	0.36	90	1.73	0.56	3.43	0.59	157
Gov. Spending on Services	1.55	0	2.30	0.44	92	0.57	0.04	1.73	0.38	157
Average Allowances	11.38	4.33	21.65	3.32	92	14.79	2.98	27.76	6.46	161
Value of Tax Benefits	2,957.63	1,490.93	4,873.69	897.92	92	4,822.81	1,853.06	12,611.14	2,414.73	161
Controls										
Mean Age at Birth	29.28	27.53	30.61	0.73	92	29.10	26.77	31.24	1.02	161
Relative Cohort Size	2.30	1.75	2.80	0.28	92	2.21	1.43	2.91	0.39	161
Female Labor Force Participation	74.82	69.4	80.9	2.71	92	59.89	40.60	96.50	9.42	161
GDP Growth	0.02	-0.07	0.06	0.02	88	0.03	-0.07	0.09	0.02	154
Gender Wage Gap	0.86	0.76	1.12	0.06	92	0.75	0.58	0.86	0.06	161
Unemployment	6.43	0.76	1.12	0.06	92	6.97	1.10	17.10	3.76	161
Employment in Service Sector	69.40	57.04	76.16	2.43	82	66.95	53.16	79.78	6.68	152

Table 9: Summary Statistics for Southern-European and Liberal Welfare State Regime

	Southern European Cluster					*Liberal Cluster*				
Variables	Mean	Min.	Max.	Std. Dev.	Obs.	Mean	Min.	Max.	Std. Dev.	Obs.
Dependent Variables										
Total Fertility Rate	1.36	1.16	1.66	0.12	92	1.73	1.22	2.18	0.24	161
Age-Specific Fertility Rate 20-24	0.05	0.02	0.11	0.02 90	0.07	0.04	0.12	0.02	152	
Age-Specific Fertility Rate 25-29	0.09	0.06	0.11	0.01	90	0.11	0.08	0.17	0.02	152
Age-Specific Fertility Rate 30-34	0.08	0.05	0.10	0.01	90	0.09	0.07	0.13	0.01	152
Age-Specific Fertility Rate 35-39	0.03	0.02	0.06	0.01	90	0.04	0.02	0.07	0.01	152
Leave Schemes										
Length of Leave	77.27	38	172	55.31	92	22.90	0	66	23.25	161
Overall Payment per Parent	43.91	25	55	11.86	92	18.44	0	60	21.98	161
Availability of Payment	1	1	1	0	92	0.49	0	1	0.30	161
Availability of Parental Leave	1	1	1	0	92	0.40	0	1	0.30	161
Childcare Services										
Availability of Childcare Leave	0	0	0	0	92	0.10	0	1	0.30	161
Payment of Childcare Leave	0	0	0	0	92	0	0	0	0	161
Enrollment in Pre-Primary Education	77.12	32.30	124	21.17	92	72.11	27.50	103	17.65	161
Cash Benefits and Tax Breaks										
Gov. Spending on Cash Benefits	0.52	0.13	0.81	0.18	92	1.14	0.10	2.57	0.77	161
Gov. Spending on Services	0.31	0.01	0.76	0.23	92	0.39	0.02	1.16	0.25	157
Average Allowances	5.68	0.60	20.69	3.91	92	8.09	0	20.76	5.69	147
Value of Tax Benefits	2,046.83	34.86	5,066.47	1,091.80	92	2,591.35	0	6,671.13	1,465.62	161
Controls										
Mean Age at Birth	29.11	26.44	30.96	1.23	90	28.64	26.42	31.00	1.02	152
Relative Cohort Size	2.03	1.59	2.30	0.33	92	2.13	1.49	2.87	0.31	161
Female Labor Force Participation	51.79	34.5	72.9	9.32	92	67.67	57.30	81.30	4.73	161
GDP Growth	0.02	-0.03	0.07	0.02	88	0.02	-0.06	0.06	0.02	154
Gender Wage Gap	0.77	0.65	0.83	0.05	92	0.73	0.47	0.95	0.10	161
Unemployment	10.41	3.95	24.20	4.66	92	5.82	0.50	11.40	2.46	161
Employment in Service Sector	57.67	42.94	68.05	6.15	92	70.06	57.06	79.46	5.18	139

Table 10: Data on Germany

Variables	Data on United Germany from
TFR	1990
ASFR 20-24	1989
ASFR 25-29	1989
ASFR 30-34	1989
ASFR 35-39	1989
Maternity and Parental Leave	1989
Childcare Leave	1989
Enrollment in Pre-Primary Education	1989
Expenditure on Family Services	only for whole Germany
Expenditure on Cash Benefits	only for whole Germany
Average Allowances per Child	1989
Value of Tax Benefits	1989
Mean Age at Birth	1989
Relative Cohort Size	1989
Female Labor Force Participation	1991
GDP Growth	only for whole Germany
Gender Paygap	1991
Unemployment Rate	1991
Employment in Service Sector	only for whole Germany

Appendix B: Regressions

Table 11: Estimation with different definition of Country Cluster

	(1) Log TFR	(2) Log ASFR 20-24	(3) Log ASFR 25-29	(4) Log ASFR 30-34	(5) Log ASFR 35-39
Length of Leave	-0.0002	-0.0013***	-0.0010***	0.0004	0.0011***
	(0.238)	(0.003)	(0.000)	(0.139)	(0.003)
Overall Payment per Parent	0.0006*	-0.0000	-0.0009***	0.0005	0.0030***
	(0.064)	(0.962)	(0.005)	(0.428)	(0.002)
Availability of Payment	-0.0649***	-0.1988***	0.0337*	0.0368	-0.0966**
	(0.000)	(0.000)	(0.067)	(0.199)	(0.029)
Availability of Parental Leave	-0.0271**	-0.0299	0.0461**	0.0105	-0.0306
	(0.049)	(0.539)	(0.018)	(0.719)	(0.503)
Availability of Childcare Leave	0.0902***	0.1355***	0.0234	0.0508	0.1443***
	(0.000)	(0.003)	(0.144)	(0.138)	(0.005)
Payment of Childcare Leave	0.0286	-0.1281***	0.1089***	0.1250***	0.0081
	(0.140)	(0.001)	(0.000)	(0.000)	(0.837)
Enrollment in Pre-Primary Education	0.0007**	-0.0054***	-0.0011***	0.0043***	0.0060***
	(0.011)	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0556***	0.0588***	-0.0002	0.0745***	0.1831***
	(0.000)	(0.005)	(0.986)	(0.000)	(0.000)
Gov. Spending on Services	0.1442***	0.0859**	0.1491***	0.1594***	0.2423***
	(0.000)	(0.014)	(0.000)	(0.000)	(0.000)
Average Allowances	-0.0041***	-0.0007	-0.0006	-0.0085***	-0.0095***
	(0.002)	(0.810)	(0.682)	(0.000)	(0.001)
Value of Tax Benefits	-0.0000*	0.0000	-0.0000***	-0.0000***	-0.0000*
	(0.073)	(0.230)	(0.007)	(0.001)	(0.093)
Nordic Countries	-0.1023***	-0.2759***	-0.1672***	-0.0157	0.0711
	(0.001)	(0.000)	(0.000)	(0.732)	(0.342)
Southern-European Countries	-0.0648***	-0.3296***	-0.4040***	0.0342	0.4835***
	(0.004)	(0.000)	(0.000)	(0.551)	(0.000)
English-Speaking Countries and Japan	0.0948***	-0.2804***	-0.1502***	0.2757***	0.6091***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Mean Age at Birth	-0.0059				
	(0.412)				
Relative Cohort Size	-0.1600***	-0.4910***	-0.3381***	0.0913***	0.3381***
	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)
Log Female Labor Force Participation	0.1176***	0.1825	-0.0933*	0.1302**	0.1216
	(0.009)	(0.128)	(0.056)	(0.035)	(0.208)
GDP Growth	0.4312**	-0.9414*	-0.3774*	1.1241***	2.4675***
	(0.024)	(0.057)	(0.068)	(0.000)	(0.000)
Change in Gender Wage Gap	0.0292	-0.2750	-0.0411	0.0623	0.0968
	(0.868)	(0.544)	(0.827)	(0.726)	(0.745)
Unemployment	-0.0022	-0.0106***	-0.0021	0.0042*	0.0079**
	(0.101)	(0.010)	(0.258)	(0.051)	(0.018)
Change in Employment in Service Sector	0.1568	0.9468*	-0.0560	-0.4317	-0.1201
	(0.504)	(0.092)	(0.871)	(0.249)	(0.798)
Constant	0.3921	-1.6889***	-0.8814***	-3.7751***	-5.8224***
	(0.155)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	381	375	375	375	375
R^2	0.783	0.660	0.816	0.667	0.672
Adjusted R^2	0.771	0.641	0.806	0.648	0.653

p-values in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Continental European Countries

Table 12: Estimation for time period from 1987 to 2008

	(1) Log TFR	(2) Log ASFR 20-24	(3) Log ASFR 25-29	(4) Log ASFR 30-34	(5) Log ASFR 35-39
Length of Leave	-0.0005***	-0.0011***	-0.0008***	-0.0001	-0.0002
	(0.001)	(0.004)	(0.000)	(0.522)	(0.510)
Overall Payment per Parent	0.0002	-0.0003	-0.0008**	0.0001	0.0018
	(0.584)	(0.730)	(0.010)	(0.856)	(0.120)
Availability of Payment	-0.0816***	-0.2281***	0.0246	0.0407	-0.1053**
	(0.000)	(0.000)	(0.223)	(0.206)	(0.048)
Availability of Parental Leave	-0.0138	-0.0234	0.0441**	0.0250	0.0158
	(0.330)	(0.626)	(0.027)	(0.359)	(0.717)
Availability of Childcare Leave	0.0771***	0.1417***	0.0318*	0.0256	0.0756
	(0.000)	(0.002)	(0.058)	(0.474)	(0.187)
Payment of Childcare Leave	0.0188	-0.1050***	0.1200***	0.1070***	-0.0286
	(0.335)	(0.005)	(0.000)	(0.000)	(0.545)
Enrollment in Pre-Primary Education	0.0002	-0.0059***	-0.0013***	0.0044***	0.0059***
	(0.530)	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0449***	0.0409*	-0.0053	0.0755***	0.1738***
	(0.000)	(0.092)	(0.597)	(0.000)	(0.000)
Gov. Spending on Services	0.1253***	0.0916***	0.1571***	0.1353***	0.1762***
	(0.000)	(0.010)	(0.000)	(0.000)	(0.000)
Average Allowances	-0.0044***	0.0019	0.0008	-0.0108***	-0.0142***
	(0.001)	(0.503)	(0.598)	(0.000)	(0.000)
Value of Tax Benefits	-0.0000***	0.0000	-0.0000*	-0.0000***	-0.0000***
	(0.005)	(0.150)	(0.058)	(0.000)	(0.000)
Social-Democratic Cluster	-0.1534***	-0.2768***	-0.1534***	-0.0684	-0.0823
	(0.000)	(0.000)	(0.000)	(0.130)	(0.276)
Southern-European Cluster	-0.1451***	-0.2811***	-0.3599***	-0.0820*	0.1797***
	(0.000)	(0.000)	(0.000)	(0.060)	(0.009)
Liberal Cluster	-0.0197	-0.2695***	-0.1108***	0.1386***	0.2193***
	(0.482)	(0.000)	(0.000)	(0.001)	(0.001)
Mean Age at Birth	0.0087				
	(0.225)				
Relative Cohort Size	-0.1659***	-0.4929***	-0.3454***	0.1170***	0.4113***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Log Female Labor Force Participation	0.1958***	0.2430*	-0.0918*	0.1874***	0.3284***
	(0.000)	(0.052)	(0.095)	(0.008)	(0.003)
GDP Growth	0.3716*	-1.3771***	-0.5841**	1.4522***	3.1233***
	(0.053)	(0.009)	(0.013)	(0.000)	(0.000)
Change in Gender Wage Gap	0.0544	-0.3835	-0.1035	0.1853	0.3798
	(0.748)	(0.415)	(0.601)	(0.327)	(0.207)
Unemployment	-0.0004	-0.0138***	-0.0043**	0.0092***	0.0204***
	(0.789)	(0.000)	(0.025)	(0.000)	(0.000)
Change in Employment in Service Sector	0.1609	0.7513	-0.1311	-0.3508	-0.0182
	(0.474)	(0.174)	(0.709)	(0.366)	(0.974)
Constant	-0.1605	-1.8806***	-0.8929***	-3.9305***	-6.4028***
	(0.536)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	381	375	375	375	375
R^2	0.775	0.655	0.807	0.618	0.555
Adjusted R^2	0.762	0.636	0.796	0.597	0.530

p-values in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Conservative Countries

Table 13: Estimation for time period from 1989 to 2008

	(1) Log TFR	(2) Log ASFR 20-24	(3) Log ASFR 25-29	(4) Log ASFR 30-34	(5) Log ASFR 35-39
Length of Leave	-0.0006***	-0.0014***	-0.0011***	-0.0001	-0.0001
	(0.000)	(0.001)	(0.000)	(0.558)	(0.709)
Overall Payment per Parent	0.0007*	0.0006	-0.0009***	0.0002	0.0025**
	(0.077)	(0.454)	(0.010)	(0.805)	(0.047)
Availability of Payment	-0.0931***	-0.2422***	0.0146	0.0393	-0.1048*
	(0.000)	(0.000)	(0.477)	(0.259)	(0.071)
Availability of Parental Leave	-0.0378***	-0.0608	0.0449**	0.0110	-0.0435
	(0.008)	(0.208)	(0.016)	(0.703)	(0.351)
Availability of Childcare Leave	0.0592***	0.1321***	0.0158	-0.0006	0.0324
	(0.007)	(0.006)	(0.368)	(0.987)	(0.623)
Payment of Childcare Leave	0.0253	-0.1167***	0.1261***	0.1352***	0.0001
	(0.212)	(0.002)	(0.000)	(0.000)	(0.999)
Enrollment in Pre-Primary Education	0.0004	-0.0054***	-0.0012***	0.0044***	0.0063***
	(0.187)	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0364***	0.0365	-0.0184*	0.0651***	0.1642***
	(0.001)	(0.168)	(0.067)	(0.000)	(0.000)
Gov. Spending on Services	0.1427***	0.1200***	0.1709***	0.1405***	0.1932***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Average Allowances	-0.0042***	0.0001	0.0016	-0.0094***	-0.0129***
	(0.002)	(0.968)	(0.254)	(0.000)	(0.000)
Value of Tax Benefits	-0.0000**	0.0000	-0.0000	-0.0000***	-0.0000***
	(0.037)	(0.291)	(0.294)	(0.000)	(0.005)
Social-Democratic Cluster	-0.1445***	-0.2988***	-0.1669***	-0.0370	-0.0074
	(0.000)	(0.000)	(0.000)	(0.434)	(0.928)
Southern-European Cluster	-0.1381***	-0.3052***	-0.3689***	-0.0512	0.2441***
	(0.000)	(0.000)	(0.000)	(0.264)	(0.000)
Liberal Cluster	-0.0132	-0.2769***	-0.1384***	0.1586***	0.2864***
	(0.642)	(0.001)	(0.000)	(0.001)	(0.000)
Mean Age at Birth	0.0116*				
	(0.097)				
Relative Cohort Size	-0.1722***	-0.4272***	-0.3550***	0.0701*	0.3680***
	(0.000)	(0.000)	(0.000)	(0.075)	(0.000)
Log Female Labor Force Participation	0.2137***	0.2602*	-0.0298	0.2136***	0.3009***
	(0.000)	(0.053)	(0.570)	(0.004)	(0.010)
GDP Growth	0.2550	-1.7039***	-0.7244***	1.5688***	3.1275***
	(0.186)	(0.001)	(0.004)	(0.000)	(0.000)
Change in Gender Wage Gap	-0.0413	-0.4803	-0.1156	0.1192	0.1874
	(0.815)	(0.331)	(0.556)	(0.533)	(0.532)
Unemployment	-0.0012	-0.0140***	-0.0033*	0.0082***	0.0159***
	(0.333)	(0.000)	(0.072)	(0.001)	(0.000)
Change in Employment in Service Sector	0.2108	0.6974	-0.0768	-0.2334	0.1197
	(0.336)	(0.203)	(0.829)	(0.512)	(0.839)
Constant	-0.3092	-2.0845***	-1.1124***	-3.9583***	-6.2423***
	(0.217)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	344	338	338	338	338
R^2	0.805	0.675	0.830	0.625	0.567
Adjusted R^2	0.792	0.654	0.820	0.602	0.540

p-values in parentheses, $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Conservative Countries

Table 14: Estimation without Lagged Independent Variables

	(1) Log TFR	(2) Log ASFR 20-24	(3) Log ASFR 25-29	(4) Log ASFR 30-34	(5) Log ASFR 35-39
Length of Leave	-0.0006***	-0.0015***	-0.0010***	-0.0001	0.0004
	(0.000)	(0.000)	(0.000)	(0.767)	(0.201)
Overall Payment per Parent	0.0003	0.0013	-0.0009**	-0.0003	0.0009
	(0.345)	(0.240)	(0.033)	(0.700)	(0.521)
Availability of Payment	-0.0618***	-0.2298***	0.0058	0.0360	-0.0430
	(0.001)	(0.000)	(0.822)	(0.311)	(0.490)
Availability of Parental Leave	0.0140	-0.0195	-0.0046	0.0684**	0.0917*
	(0.317)	(0.657)	(0.812)	(0.010)	(0.052)
Availability of Childcare Leave	0.1043***	0.3093***	0.0380	-0.0133	0.0446
	(0.000)	(0.000)	(0.113)	(0.641)	(0.338)
Payment of Childcare Leave	-0.0129	-0.2458***	0.0680***	0.1157***	0.0284
	(0.466)	(0.000)	(0.007)	(0.000)	(0.561)
Enrollment in Pre-Primary Education	-0.0001	-0.0070***	-0.0014***	0.0041***	0.0057***
	(0.760)	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0817***	0.1569***	0.0348***	0.0520***	0.1348***
	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)
Gov. Spending on Services	0.1249***	0.0393	0.0781***	0.1721***	0.2547***
	(0.000)	(0.307)	(0.001)	(0.000)	(0.000)
Average Allowances	-0.0093***	-0.0058**	-0.0031**	-0.0117***	-0.0154***
	(0.000)	(0.039)	(0.042)	(0.000)	(0.000)
Value of Tax Benefits	-0.0000***	-0.0000***	-0.0000***	-0.0000**	0.0000
	(0.000)	(0.000)	(0.000)	(0.010)	(0.364)
Social-Democratic Cluster	-0.1987***	-0.4086***	-0.1775***	-0.0610	-0.0379
	(0.000)	(0.000)	(0.000)	(0.121)	(0.592)
Southern-European Cluster	-0.1933***	-0.2943***	-0.3763***	-0.1447***	0.1430**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.026)
Liberal Cluster	-0.0424**	-0.3001***	-0.2016***	0.1367***	0.3012***
	(0.041)	(0.000)	(0.000)	(0.000)	(0.000)
Mean Age at Birth	-0.0076				
	(0.211)				
Constant	0.8293***	-1.8602***	-1.7875***	-2.8289***	-4.2225***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	453	453	453	453	453
R^2	0.692	0.524	0.670	0.520	0.374
Adjusted R^2	0.681	0.509	0.659	0.504	0.354

p-values in parentheses, (p<0.1, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t

Reference Category for Country Cluster: Conservative Countries

Table 15: Estimation without Germany

	(1) Log TFR	(2) Log ASFR 20-24	(3) Log ASFR 25-29	(4) Log ASFR 30-34	(5) Log ASFR 35-39
Length of Leave	-0.0004**	-0.0016***	-0.0008***	0.0002	0.0003
	(0.019)	(0.000)	(0.000)	(0.196)	(0.372)
Overall Payment per Parent	0.0002	0.0005	-0.0007**	-0.0003	0.0012
	(0.607)	(0.546)	(0.025)	(0.677)	(0.271)
Availability of Payment	-0.0793***	-0.2157***	0.0259	0.0339	-0.1169**
	(0.000)	(0.000)	(0.203)	(0.289)	(0.028)
Availability of Parental Leave	-0.0111	0.0078	0.0501**	0.0141	0.0015
	(0.464)	(0.867)	(0.015)	(0.586)	(0.973)
Availability of Childcare Leave	0.0731***	0.2185***	0.0406**	-0.0111	0.0264
	(0.001)	(0.000)	(0.026)	(0.776)	(0.671)
Payment of Childcare Leave	0.0221	-0.0855**	0.1238***	0.1001***	-0.0390
	(0.255)	(0.023)	(0.000)	(0.000)	(0.391)
Enrollment in Pre-Primary Education	0.0003	-0.0056***	-0.0013***	0.0042***	0.0056***
	(0.314)	(0.000)	(0.000)	(0.000)	(0.000)
Gov. Spending on Cash Benefits	0.0484***	0.0667***	-0.0005	0.0666***	0.1627***
	(0.000)	(0.009)	(0.962)	(0.000)	(0.000)
Gov. Spending on Services	0.1245***	0.1345***	0.1609***	0.1125***	0.1441***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Average Allowances	-0.0058***	0.0026	-0.0002	-0.0130***	-0.0175***
	(0.000)	(0.395)	(0.860)	(0.000)	(0.000)
Value of Tax Benefits	-0.0000***	-0.0000	-0.0000**	-0.0000***	-0.0000**
	(0.006)	(0.851)	(0.016)	(0.002)	(0.014)
Social-Democratic Cluster	-0.1588***	-0.3613***	-0.1737***	-0.0461	-0.0573
	(0.000)	(0.000)	(0.000)	(0.316)	(0.476)
Southern-European Cluster	-0.1617***	-0.2245***	-0.3708***	-0.1397***	0.0929
	(0.000)	(0.002)	(0.000)	(0.000)	(0.149)
Liberal Cluster	-0.0262	-0.2093***	-0.1141***	0.0919**	0.1489**
	(0.365)	(0.004)	(0.000)	(0.027)	(0.028)
Mean Age at Birth	0.0022				
	(0.777)				
Relative Cohort Size	-0.1458***	-0.5652***	-0.3488***	0.1625***	0.4850***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log Female Labor Force Participation	0.1913***	0.1839	-0.0982*	0.2142***	0.3566***
	(0.000)	(0.147)	(0.077)	(0.002)	(0.001)
GDP Growth	0.3305*	-1.1711**	-0.6484***	1.2131***	2.7743***
	(0.072)	(0.026)	(0.005)	(0.000)	(0.000)
Change in Gender Wage Gap	0.0232	-0.2508	-0.1159	0.0691	0.1916
	(0.892)	(0.595)	(0.563)	(0.697)	(0.516)
Unemployment	-0.0003	-0.0159***	-0.0048**	0.0098***	0.0211***
	(0.824)	(0.000)	(0.015)	(0.000)	(0.000)
Change in Employment in Service Sector	0.2861	0.6098	-0.0374	-0.0938	0.3396
	(0.206)	(0.255)	(0.907)	(0.796)	(0.552)
Constant	0.0064	-1.6059***	-0.8522***	-4.0402***	-6.5257***
	(0.981)	(0.003)	(0.000)	(0.000)	(0.000)
Observations	365	359	359	359	359
R^2	0.779	0.678	0.806	0.651	0.587
Adjusted R^2	0.766	0.659	0.795	0.630	0.563

p-values in parentheses, $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Fixed Effects refers to Country Cluster Fixed Effects

Independent Variables are measured in t-1

Reference Category for Country Cluster: Continental European Countries