Essays on Family Policies and the Child Penalty

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Abstract

The first and third essays analyse the introductions and gradual extensions of maternity and parental leave in Finland between the 1960s and the early 1980s. I estimate causal effects of these policy changes on the labour market outcomes of eligible parents in the medium-to-long run (essay I) and on children’s education and employment, as well as cognitive and non-cognitive skills of male army recruits (essay III). As the child’s date of birth determined parents’ eligibility to longer leave, I employ a regression discontinuity design comparing the outcomes of children (or their parents) born before and after the reforms’ cut-off dates. In both studies, I find imprecisely estimated null effects, indicating that the reforms did not clearly improve nor worsen parents’ and children’s outcomes. Effects within the range of -10% and +10% of the mean cannot be excluded. Only for the first reform introducing maternity benefits in 1964, the zero effects are precisely estimated.

The second essay presents evidence on the evolution of the child penalty in Finland over the last 50 years. During this time, several family policy reforms radically improved the conditions of new parents. Now, Finland has one of the most generous and longest parental leaves in the world. Parents are also older and more educated than in the 1970s. Exploiting population-wide administrative records from 1970 until today, we find that the child penalty in has decreased by almost 60%, from around 60% to 25%. However, most of the decline happened in the first ten years, during which both the availability of formal subsidized day care and the length of paid parental leave expanded significantly. We find that the expansion of maternity and parental leaves had a larger role, compared to changes in parental characteristics, in determining improvements in the child penalty, especially in the first decades. On the other hand, the child homecare leave is associated with a worsening of the child penalty from 1985.

In the fourth essay, I replicate the paper by Danzer and Lavy (2018). They study how the duration of paid parental leave affects children’s educational performance using data from PISA. An extension of the maximum duration from 12 to 24 months in Austria had no statistically significant effect on average, but the authors highlight the existence of large and statistically significant heterogenous effects that vary in sign depending on the education of mothers and children’s gender. I replicate their study following the recommended estimation procedure taking into account both the survey’s stratified two-stage sample design and the fact that PISA relies on imputation to derive student scores. I show that the estimates of the effects of the parental leave extension become substantially smaller in absolute magnitude and non-significant.

Keywords family policies, maternity leave, parental leave, gender gap, child penalty

ISSN (printed) 1799-4934 ISSN (pdf) 1799-4942
Location of publisher Helsinki Location of printing Helsinki Year 2023
Plenty of people contributed to the making of this dissertation.

I am extremely grateful to Associate Professors Kristiina Huttunen and Natalia Zinovyeva for their excellent supervision. Kristiina, I enjoyed working together on our paper. It was like a breath of fresh air after a long time spent alone on my single-authored projects. You also showed me how to do research more efficiently. My only wish is that we had started sooner. Natalia, I was lucky to work on my Master's thesis under your supervision. Your encouragement to pursue a PhD is the reason why I am here now. Thank you for pushing me to do better and for helping me see the good in my work when I could not. I would also like to acknowledge Professor Matti Liski’s valuable feedback, especially at the early stages of my research.

I am equally thankful to Professor Manuel Bagues for his enthusiastic teaching of the applied microeconometrics course presenting a whole lot of research questions that I had no idea could be tackled by economists. This inspired me to embark on a more ambitious Master’s thesis project than strictly necessary. I am also grateful to him for hosting me at the University of Warwick and advising me during the writing and the submission process of my first published article. Manuel and Natalia, thank you also for making me feel at home with the many conversations in Italian. I have missed you since you moved to England.

I am grateful to pre-examiners Associate Professor Arizo Karimi and Assistant Professor Terhi Ravaska, who provided valuable comments to the thesis manuscript. Undoubtedly, their suggestions will improve the essays towards publication in academic journals. I want to thank Professor Rita Ginja for agreeing to act as opponent at the defence. I look forward to the discussion. I acknowledge the financial support from OP-Pohjola Group Research Foundation, Finnish Cultural Foundation, Yrjö Jahnsson Foundation and the HSE Support Foundation.

The Department of Economics at Aalto University has been a great environment to carry out my doctoral studies. It was a pleasure to be teaching assistant for Professors Juuso Välimäki and Matti Liski: I learned
a lot. I enjoyed the coffee break conversations with Assistant Professor Daniel Hauser. I highly valued Associate Professor Matti Sarvimäki’s advice regarding research after doctoral studies and his invitation to join his recent projects. Finally, thanks to the department secretary, Maria Kinnunen, for assistance in all administrative matters.

It can get quite lonely when three-quarters of one’s dissertation are single-authored. Luckily, I had the privilege of being surrounded by friends and colleagues to make the research process a bit less tedious. First of all, thank you Aino and Maarit for forming our “feedback group”. We exchanged comments and suggestions to improve our research and encouraged each other to carry on. I would not be done without your help and support. We also had plenty of time to rant about PhD studies and chat about life. I know our friendship will continue even beyond the degree. Andrey, thanks for being my friend from the very start. Tolga, after you graduated, we kept up our weekly lunches, a tradition I cherish, and I hope will carry on even when our work schedules become less flexible. I also enjoyed the lengthy chats with my office mates throughout the years: Aleksi, Juuso, Lassi, Salla and Teemu. Many other fellow students were of great company during lunch and coffee breaks: Arttu, Atte, Eero, Jerry, Mikael, Ramin and Topi.

To my friends outside academia, thank you for keeping me in touch with the real world: Adar, Melanie, Victoria, Janica, Pier Paolo, Daniele, Elisa-betta, Sarah, Domenico, and Angelo. Sarah deserves a special mention for drawing the cover picture of this thesis.

To Betta, I have known you all my life and, despite choosing different fields, we ended up hitting all the academic milestones together, with you preceding me by just a few months first with the Master’s degree and then with the PhD in Law. It has been comforting to share the pains and joys of doctoral studies.

I want to thank my family for supporting me even from far away and for providing a perfect refuge from the Finnish winter. I have practiced explaining my research not only to non-economists but also in Italian, which made it all the more difficult. To my Mum, I wish you were here to see me follow your footsteps in academic research. To the Caltons, thank you for welcoming me into your family more than ten years ago.

Finally, I want to thank my husband Alex for being by my side through it all.

Vantaa, August 9, 2023,

Claudia Troccoli
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List of Essays

This doctoral thesis consists of an introduction and the following essays.

1. The Impacts of Maternity and Parental Leave on Parents: Evidence from Finland.
   Unpublished manuscript

   Unpublished manuscript

3. The Impacts of Maternity and Parental Leave on Children: Evidence from Finland.
   Unpublished manuscript

   Forthcoming in the Journal of Applied Econometrics.
1. The Impacts of Maternity and Parental Leave on Parents: Evidence from Finland.
   *Single authored.*

   *Huttunen developed the idea and the empirical method. Troccoli conducted the analysis. Troccoli and Huttunen wrote the article.*

3. The Impacts of Maternity and Parental Leave on Children: Evidence from Finland.
   *Single authored.*

   *Single authored.*
This doctoral dissertation consists of three unpublished essays and one published article. The connecting theme is family policies, in particular maternity and parental leave.

A gender wage and employment gap has been widely documented across the world (International Labour Organization 2018; World Economic Forum 2022). According to the OECD (2023), the 2020 average gender wage gap for OECD and EU countries were 11.87% and 10.47%, respectively. Finland’s gender wage gap was substantially larger, at 15.98%.

A key factor explaining the gender wage gap is childbirth, a significant life event associated with large decreases in women’s earnings but no substantial changes in men’s earnings. Kleven et al. (2019) show that in Denmark, the fraction of gender inequality due to children was as large as 80% in 2013. Several studies have shown that the child penalty, the percentage by which mothers’ earnings drop due to children with respect to fathers’ earnings, can persist even in the long run (Angelov et al. 2016; Lundborg et al. 2017; Kleven et al. 2019). Women experience career interruptions and lose out on promotions opportunities, and tend to select into jobs with more flexibility and proximity to home, which are more likely to be lower-paid (Bertrand et al. 2010; Blau and Kahn 2017; Kleven et al. 2019; Goldin and Mitchell 2017; Lundborg et al. 2017).

Various policies have been introduced to facilitate the transition of women into motherhood and back into the workforce, with the aim of improving both mothers’ labor market prospects and children’s well-being.

For example, job-protected and paid maternity leave could allow mothers to care for their newborns in the first months, without having to drop out of the labour force. This leave can be combined with high-quality and subsidized early childcare, which would enable mothers to return to work at the end of the leave.

Paternity and shareable parental leave are other policies that could potentially promote gender equality at home and at the societal level. By providing fathers with the opportunity to take time off work to care for their children, these policies help to remove the notion of child-rearing as
CHAPTER 1. INTRODUCTION

a task solely reserved for mothers, encouraging a more equal distribution of parenting responsibilities between men and women.

These policies can also have multiple positive effects on children’s well-being. Firstly, they can relieve maternal stress, even before childbirth. Research has shown that maternal stress during pregnancy can negatively impact children’s cognitive and behavioural outcomes (Aizer et al. 2016; Black et al. 2016).

Secondly, job-protected maternity leave can enable mothers to breastfeed their infants for a longer period of time. Breastfeeding has been linked to various positive health outcomes for children (Brooks-Gunn et al., 2002). Furthermore, spending more time with parents during the early years of life can also improve children’s social, emotional, and cognitive development.

Thirdly, these policies can have a positive impact on children’s future academic and economic success. Early childhood interventions have been shown to improve cognitive and non-cognitive skills that are critical for success in later life (Cunha and Heckman 2008; Cunha et al. 2010). Children who have a good start in life are more likely to perform well in school and have higher educational attainment, which, in turn, can lead to higher-paying jobs later in life.

However, there are potentially complex mechanisms that interlink the effects of maternity and parental leave on maternal labour market outcomes and on children’s outcomes, especially in the medium-to-long run.

First of all, the relationship between maternity leave and maternal labor supply, career trajectories, and income is theoretically unclear (Becker and Tomes 1986; Ermisch and Francesconi 2013).

On the one hand, for mothers who would have dropped out of the labour force in the absence of leave, the availability of job-protected maternity leave can have a positive impact on job continuity. By allowing these mothers to take time off without losing their jobs, maternity leave can encourage their return to work, which could ultimately benefit their long-term career prospects and earnings.

On the other hand, for mothers who would have otherwise returned to work soon after childbirth, the availability of maternity leave can lead to extended absences from work, potentially hindering their career progression. This could be especially true for women in highly competitive fields. In particular, prolonged leaves might be detrimental to mothers’ careers, causing a loss of human capital, especially if spells for successive births overlap, further extending the period of absence from the labour market (Olivetti and Petrongolo, 2017).

If job-protected leave improved mothers’ careers and wages, it would lead to an increase in family income. It may allow for more nutritious food options, higher-quality childcare, and better educational resources. This, in turn, may positively impact the child’s academic performance and
increase their chances of success in the workforce later in life. Conversely, if leave deteriorates mothers’ careers and lowers family income, this could have detrimental effects on child’s outcomes.

Another important consideration is the impact of decreased interaction between mother and child due to maternal work. Research suggests that a weaker attachment between parent and child could have negative effects on children’s long-term outcomes (Heckman 2000). While other family members and daycare teachers may substitute for parents’ care, the effectiveness of these substitutes may depend on the characteristics of the parents, such as their education level and socio-economic status, as well as the quality of the substitute care (Fort et al., 2020).

For these reasons, the effects of maternity leave on both mothers and children should be considered jointly, to identify potential trade-offs between children’s life outcomes and mothers’ careers.

In this doctoral dissertation, I try to understand the consequences of family leave policies on the labour market outcomes of parents, especially mothers, and on children’s educational attainment and employment, as well as their cognitive and non-cognitive skills. In the first three essays, I focus on the Finnish context. The last essay studies a parental leave expansion in Austria.

In the second half of the XX century, Finland underwent a radical societal transformation. With the implementation of several family policy reforms, it became one of the most family-friendly countries in the world, with generous parental leaves and high-quality childcare. The female labour force participation rate increased remarkably fast, especially for married women and mothers (Haavio-Mannila 1968; Jallinoja 1985).

Figure 1.1 shows the history of family leave policies in Finland. Between 1964 and 1981, several reforms introduced and then expanded paid maternity and parental leave. Since 1981, the combined length of the two types of leave has remained fairly stable. However, in 1983 and 1985 maternity leave was shortened in favour of a longer shareable parental leave, reflecting an attempt to encourage more fathers to take part in childcare. Another key policy introduced in 1985 is the child home care allowance, a job-protected leave with a flat benefit available until the youngest child’s third birthday, if they do not enrol their child into municipal or private daycare. A dedicated paternity leave was introduced in 1991; twelve years later, it was increased from three to five weeks; in 2011, it was further lengthened to seven weeks.

**Essay I: The Impacts of Maternity and Parental Leave on Parents: Evidence from Finland** In the first essay, I study the eight early reforms that introduced and then gradually extended maternity and parental leave between 1964 and 1981. I analyse their effects on the earnings and employment of mothers and fathers in the short, medium, and long run. The estimation method exploits the institutional framework, whereby only parents that
Figure 1.1. Changes to family leave entitlement in Finland. *
Before 1964, some professions had unpaid maternity leave: four weeks for factory workers and six weeks for those working in trade or as officers. **The 1964 reform introduced nine weeks of universal maternity benefits, without job-protected maternity leave. From 1971 onwards, changes to the length of job-protected leave also applied to the provision of benefits. The length of child home care leave is always until the youngest child's third birthday.

gave birth after a specified date were eligible to longer leave. Since this cutoff date was announced shortly before the implementation of the policy, parents could not affect their assignment to treatment. Therefore, I can compare the outcomes of parents whose children were born just before and just after the reform cutoff date, obtaining the causal effects of the reforms. As I have no information on take-up rates of leave by parents, I estimate intention-to-treat effects. The Finnish context and setup present a number of advantages. I study different reforms implemented in the same country and over a relatively short time. This allows me to isolate the effects of the policy changes from the role of the country context. Additionally, each reform only modified the length of maternity or parental leave, but kept constant all the other rules regarding eligibility and benefits payment. In this way, I can isolate the effects of the leave extensions. Furthermore, as the reforms implemented were the introductions and various smaller and larger extensions of maternity and parental leave at different margins, I can compare the effects by size of the extension, as well as the margin at which it is introduced. I find that the reforms had no discernible positive or negative effect on parents’ earnings, neither in the medium nor in the long run. The estimated effects are close to zero for all reforms, but for most of them these are too imprecisely estimated to rule out positive or negative impacts smaller than ten percent in absolute value. Only for the
first reform introducing maternity benefits in 1964, the zero effects are precisely estimated. I find no differences between the effects of maternity versus parental leave or between leave extensions at different lengths or at different margins. Additionally, I explore potential heterogeneous effects depending on parental education level, but find that the effects were approximately zero and imprecisely estimated for parents with all education levels. I also consider whether first-time parents were differentially affected by the reforms compared to parents with older children, but I consistently find zero effects for both groups.

**Essay II: The Evolution of the Child Penalty**  
The second essay, joint with Kristiina Huttunen, presents evidence on the evolution of the child penalty in Finland. Exploiting population-wide administrative records from 1970 until today, we illustrate how changes in the child penalty have evolved alongside changes in family policies and changes in selection into motherhood. The child penalty in Finland has decreased by almost 60% between 1970 and 2016, from around 60% to 25%. However, most of the decline happened in the first ten years, during which both the availability of formal subsidized day-care and the length of paid parental leave expanded significantly. The child penalty stopped its decline in the second half of the 1980s, at the same time as the introduction of the child home care allowance. This is a generous child benefit paid to parents that do not place their children into formal childcare, and is available until the youngest child’s third birthday. The introduction and later extensions of paternity leave did not correspond with any changes in the child penalty. We make several contributions to the literature on the child penalty. First, we provide evidence on how the child penalty has changed over time. Second, we propose a new way to calculate the child penalty from cross-sectional data. Finally, we investigate the role of leave use and parents’ characteristics on mothers’ individual child penalty. This analysis reveals that leave-taking behaviour consistent with a more equal distribution of childcare responsibilities between fathers and mothers improves mothers’ labor market outcomes (diminishes the child penalty). In fact, longer use of child homecare allowance, a fixed paid leave available until the youngest child is three years old, worsens significantly the child penalty. This finding is supported by research showing that increases in the child homecare allowance level significantly encourage mothers to stay home with their children and negatively affects maternal employment even in the long run (Gruber et al., 2022; Kosonen, 2014). On the other hand, longer use of parental leave by fathers is associated with a smaller child penalty. Additionally, we find that increases in parents’ educational level and age at birth are associated with improvements in the child penalty.

**Essay III: The Impacts of Maternity and Parental Leave on Children: Evidence from Finland**  
In the third essay, I return to the causal estimation of the
eight maternity and parental leave reforms implemented between 1964 and 1981 but shift the focus onto children. I implement the same empirical strategy as in Essay I, exploiting cutoff dates that determined parents' eligibility to longer maternity or parental leave. I study the causal effects of the reforms on children's educational attainment, labour market outcomes and family formation. Additionally, I leverage data from the Finnish Defence Forces to estimate the effects on cognitive and non-cognitive skills of male army recruits. For all the outcomes considered, the estimates are centred around zero. However, for most reforms I cannot exclude effects larger than -10% and smaller than +10% of the mean. The only exception is represented by the 1964 introduction of maternity benefits, for which I identify precise zero effects. I also explore potential heterogeneity by maternal education. I find no differences in outcomes for children of mothers with only primary, secondary, or tertiary education. In this case, almost all the estimates are close to zero, but they are too imprecise to exclude effects larger than -20% and smaller than +20%.

Essay IV: Does Paid Parental Leave Affect Children's Schooling Outcomes? Replicating Danzer and Lavy (2018) The last essay studies the effects of a large expansion of paid parental leave from one to two years on children's PISA scores in Austria. I replicate an article by Danzer and Lavy (2018) that identifies substantial heterogeneous effects for boys depending on their mothers' educational attainment. However, the focus of this paper is methodological. I discuss the PISA stratified two-stage sample design and use of imputation, and its implications for data analysis. Large-scale assessments, such as PISA, evaluate pupils on a wide range of abilities in mathematics, reading and science, with the aim of comparing their competencies across OECD countries. Test-takers are randomly assigned a test booklet with a small subset of questions. Multiple imputation is then applied to obtain five so-called plausible values (PVs) for each subject. Statistical analysis requires a specific procedure, which uses each of the PVs. Additionally, the selection of school and pupils for participation in the test is done via stratified sampling, reflecting the population distribution, geographically and in terms of other characteristics. For this reason, both student weights and Balanced Repeated Replication weights must be included in the estimation. Failing to follow the recommended procedure leads to the underestimation of standard errors, which may inflate the statistical significance of the estimates. I show that, especially in the case of small sample sizes, following the recommended procedure for the analysis leads to substantially different results. I find that, once the procedure is followed correctly, the expansion of Austrian parental leave did not have statistically significant effects neither on the full sample of PISA test takers, nor on children of mothers with different levels of education. Despite the large differences between the Finnish and the Austrian contexts, these results are in line with my own findings.


