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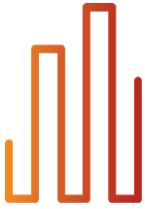SOCIO-ECONOMIC RESEARCH

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The impact of introduction of effect of parental leave policy on intensity of labour market participation of mothers. Do the number of children and pre-birth work engagement matter?

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The main research questions

- What is the effect of the introduction of the parental leave policy in 1999 on the number of hours worked per month by mothers of one or two child/ren?

- What is the effect of the policy one, two and three years after childbirth?

- Does the effect of the introduction of the policy differ between mothers who have been working full-time (more than 35 hours a week) before childbirth and those who have been working on non-marginal part-time basis (20 hours a week and more)?
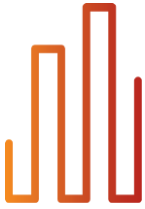
Context – general description of parental leave

- Parental leave is an employee benefit that provides time off work to care for a child. (Not to be confused with maternity leave).

- Parental leave schemes belong to the family of welfare policies facilitating reconciliation of family and work life.

- Parental leaves represent a temporal career break that allows parents to dedicate some time to childcare and, at the same time, keep the right to re-enter their original job. As a consequence, men are encouraged to be more involved in child care and women in the labour market.
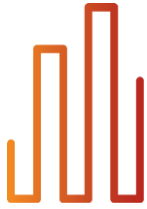
Context - Empirical evidence on the effect of parental leave on women's labour market participation

- Paid and long-enough parental leaves increase women's attachment to the labor market in terms of return to work (Mertz, 2004; Lalive & Zweimüller, 2009; Ruhm, 1998; Pronzato, 2009: Han et al., 2007, Misra et al., 2010; Klerman and Leibovitz, 1999; Baum, 2003, Schonberg & Ludsteck, 2007; Bergemann & Riphahn, 2011).

- Paid parental leave entitlements of up one year after childbirth are positively related to the odds of mothers' returning to their jobs at the end for parental leave (Pronzato, 2009, Ruhm, 1998, Waldfogel et al. 1999).

- In case of leaves longer than approximately one year, the association is not that straightforward (Ondrich et. al, 2003).

- Existence of parental leave arrangements also motivates women to enter employment before childbirth (Ruhm, 1998, Han et al., 2007) to gain eligibility for leave.
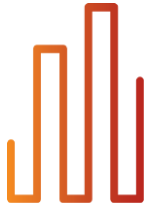
Context - Empirical evidence on the effect of parental leave on women's labour market participation

Heterogeneous effects of the policy observed among women with different wage categories and occupational status (Lalive & Zweimüller, 2009); Waldfogel et al., 2015).

Mixed evidence about the effect of parental leave policy on number of hours worked by mothers (Mertz, 2004; Bartel et al., 2015).
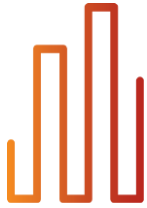
Gaps in the existing research – motivation for present paper

- The labour market outcomes in terms of number of hours worked are less often used in the literature (Mertz, 2004; Bartel et al., 2015).

- Heterogeneity analysis of the policy effect on intensity of particiption has not yet been conducted on subgroups of women working full- or part-time before child birth.

- The effect of the introduction of the policy is under-researched in Luxembourg (interesting case in terms of family policy evolution), despite the fact that in the program of the government 2013 -2018 it is announced that the parental leave will be evaluated against its main objectives, out of which one is reconciliation of work and family activities for men and women (Programme Gouvernemental, 2013).
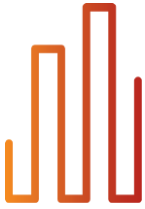
Context – Luxembourg - policy properties

- Parental leave in Luxembourg was introduced for the first time in 1999 (following the European Directive of 96/34/EC of 3 June 1996). It was a pass breaking policy effort because the remaining family policy arrangements back then were predominantly pro-familialistic.

- The leave is fully job-protected and parents are guaranteed the right to return to the same or an equivalent working position at the end of the leave.

- The parental leave scheme gives working parents in Luxembourg the right to take either a block of six months full-time parental leave or a block of twelve months part-time leave.

- The leave can be used up to the 5th birthday of the child and is an individual entitlement: both parents have the right to leave (if they meet the eligibility conditions),however, they cannot transfer it to each other.

- There is the requirement that the first leave in a two-parent family must be taken immediately after the maternity leave. If a parental leave is not taken immediately after the maternity leave the right to the leave is forfeited. However, the second leave can still be used until the child turns five.
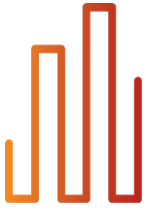
Context – Luxembourg - policy properties

- Flat rate parental leave benefit = paid parental leave.

- In 1999 the rate of compensation started out at 1496.11 EUR for the full-time leave and half of the amount for the part-time leave. The rate was adjusted for inflation in 2007 and increased to 1778.31 EUR. In 2017 it was reformed.

- The eligibility requirements for the leave are a minimum of one year employment with the same employer prior to the start of the leave and a reduction of at least 50% of working hours in the case of taking the leave part-time.

- Single parents are entitled to only one parental leave, however, they do not have to necessarily take it immediately after the maternity leave.

- Self-employed persons are eligible for parental leave if they have been self-employed for at least one year for at least 20 hours per week.
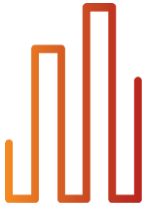
Context – Luxembourg – take-up information

The parental leave take-up rate is higher among mothers than among fathers. On average, the take-up rate between 1999 and 2007 among eligible women was 46.3 per cent compared to 10.6 per cent among eligible fathers.

The parental leave take-up has had an increasing tendency over years, particularly among fathers.

The lowest take-up rates were reported in 1999 and 2000, i.e. immediately after the introduction of the policy.

On average, 34 per cent of fathers who took parental leave opted for the part-time mode, compared to 19 per cent of mothers.

Only about 1.5 per cent of mothers of a single child who took parental leave took the second parental leave, whereas among fathers it was 35 per cent.

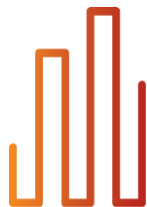(Zhelyazkova et al. 2015; Ministry of Family and Integration (2014) *Rapport d'Activité 2014)*

Tentative hypotheses

- H1 - The introduction of the policy had a positive effect on the average number of hours worked both among single-child mothers as well as among mothers of two children.

- H2- The effect the introduction of the policy persisted for longer than one year following the last childbirth (due to limited need to reduce working engagement). No differences are expected in persistence of the effect among single-child mothers and mothers of two children.

- H3 - The introduction of the policy had a more notable effect on the number of hours worked among full-timers than among part-timers (due to their labour market position and assumed level of work attachment).
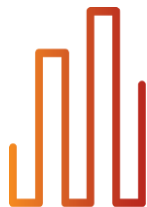
Data

- Extract from the **administrative social security records** (L' Inspection générale de la sécurité sociale -IGSS) from 1992-2007 covering full population of women in Luxembourg. Information about number of children and their birth dates available.

- Only **quarterly data** available (four observation points per year per person).

- **Selected population:** Women aged 18-38 who are either childless or single-child mothers or mothers of two children with particular birth dates and sibling constellation. Also only women working at childbirth included (following Bartel et al., 2015) => consequences for external validity!

Data - continued

- **Childless women:** haven't had children during entire observation period.

- **Single-child mothers:** those who had only one (living) child thought out the observation period. Out of these women those who gave birth to their child either during the first trimester of 1995 or during the first trimester of 1999.

- **Mothers of two children:** those who gave birth to only two living children during the entire observation period. To assure that both children were born in the period of three year either before or after the introduction of the policy, only women who gave birth to their first child either in 1993 or in 1994 and to their second child during the first trimester of 1995 and women who gave birth to their first child either in 1997 or 1998 and to their second child during the first trimester of 1999.

Data - continued

|	Before the introduction of parental leave (baseline year 1997)	After the introduction of parental leave (baseline year 2001)	Total
Mothers of a single child	458	492	950
Mother of two children	175	184	359
Childless women	8419	9594	18013
Total	9052	10270	19322

Method

- It is not possible to simply compare the number of hours worked of mothers before and after the introduction of the parental leave policy. There were many possible other institutional factors and developments that could have affected the number of hours worked (for example, the labor market participation of women has dramatically increased in the country during past decades.) **Thus, the difference-in-differences (DID) method is used.**

- DID is based on a comparison of number of hours worked before and after the introduction of parental leave for the groups affected (mothers with young children) by it to this difference for unaffected groups (childless women). This method helps to avoid many of the endogeneity problems that are typical of comparisons between heterogeneous individuals (Bertrand et al., 2001).

Model – notation

- $Y_{it} = \beta_0 + \beta_1 (\text{treat } i) + \beta_2 (\text{time } t) + \rho(\text{treat } i \cdot \text{time } t) + \beta'(X_s) + \epsilon_{it}$

- 'Y_{it}' stands for outcome variables: the number of hours worked per month at the beginning of the first trimester 1, 2 or 3 years after child birth.

- '**treat i**' represents the treatment variable. It is equal to one if a person is in group of mothers of one or two children and zero if it is a childless woman.

- '**time t**' is equal to one if a person starts to be observed after the introduction of the policy (i.e. in 1999) and zero otherwise (i.e. 1995). These two reference points/base lines were chosen due to following reasons:

  - Year 1995 - to avoid the effect of anticipation of the policy (i.e. adaptation of behavior due to anticipated introduction of policy),

  - Year 1999 to see immediate effect and avoid additional contamitaion.

  - To out knowledge, during the observed period no policy that could have affected labour market behavior of mothers of young children not introduced.
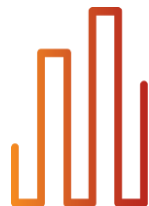
Model – notation - continued

- **'treat i·time t'** stands for the interaction between the treatment and time variables.

- **'Xs'** identifies control variables:
  - sample of employed women (full-timers and non-marginal part-timers): age, marital status (dummy), nationality (6 categories), bleu/white color worker (dummy), private/public sector (dummy), NACE2 code (11 categories), firm size (8 categories) , categorized hourly wage (28 categories – no continuous variable provided by IGSS).
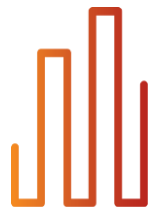
Results: single-child mothers –full- and non-marginal part-timers together

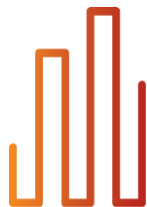| Outcome variable	Before the introduction of the policy (reference year 1997)			After the introduction of the policy (reference year 2001)			
	Control (childless)	Treatment (one child)	Difference	Control (childless)	Treatment (one child)	Difference	DIFF-IN-DIFF
Full-timers+ non-standard part-timers							
No of hours worked one year after the reference year							
Mean	168.763	126.925	-41.838***	169.972	157.512	-12.460***	29.378***
Std. error	2.812	3.467	2.160	2.873	3.475	2.094	2.978
No of hours worked two years after the reference year							
Mean	165.581	113.240	-52.341***	169.131	126.406***	-42.725	9.616***
Std. error	3.243	3.999	2.492	3.313	4.008	2.415	3.434
No of hours three years after the reference year							
Mean	167.934	126.832	-41.102***	170.073	130.189***	-39.884	1.218
Std. error	3.395	4.187	2.609	3.469	4.197	-39.884	3.218
N	8038	433		9203	460		

Results: mothers of two childen – full- and non-marginal part-timers together

| Outcome variable	Before the introduction of the policy (reference year 1997)			After the introduction of the policy (reference year 2001)			DIFF-IN-DIFF
	Control (childless)	Treatment (one child)	Difference	Control (childless)	Treatment (one child)	Difference	
Full-timers+ non-standard part-timers							
No of hours worked one year after the reference year							
Mean	166.579	133.009	-33.570***	167.963	156.187	-11.776***	21.795***
Std. error	2.795	4.425	3.527	2.855	4.331	3.293	4.758
No of hours worked two years after the reference year							
Mean	163.788	114.891	-48.897***	167.587	125.762	-41.825***	7.072***
Std. error	3.233	5.118	4.079	3.303	5.010	3.810	5.503
No of hours three years after the reference year							
Mean	165.290	121.571	-43.719***	167.66	134.081	-33.585***	10.134*
Std. error	3.397	5.379	4.287	3.471	5.265	4.004	5.784
N	8079	153		9218	175		

Results: single-child mothers – full-timers and non-marginal part-timers separately

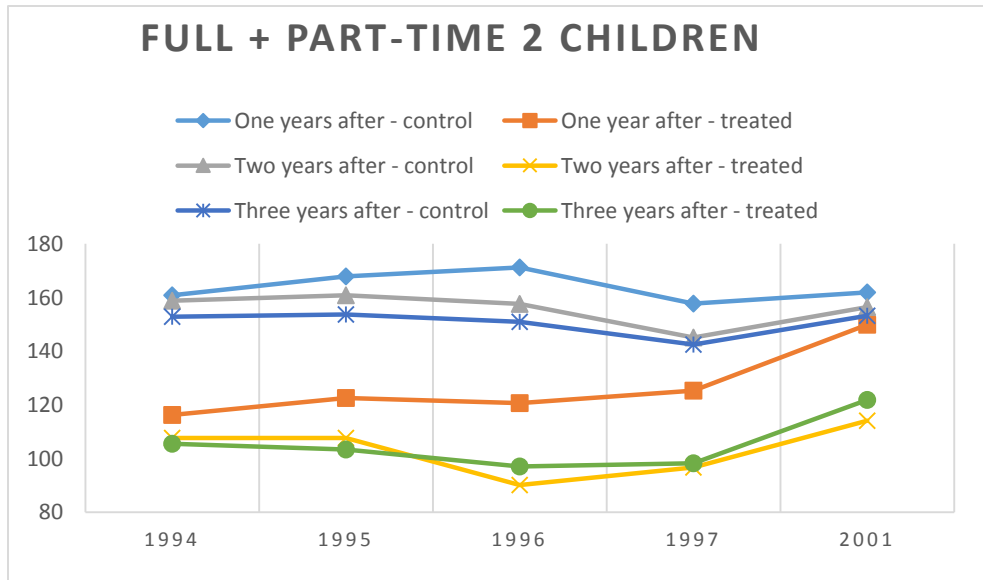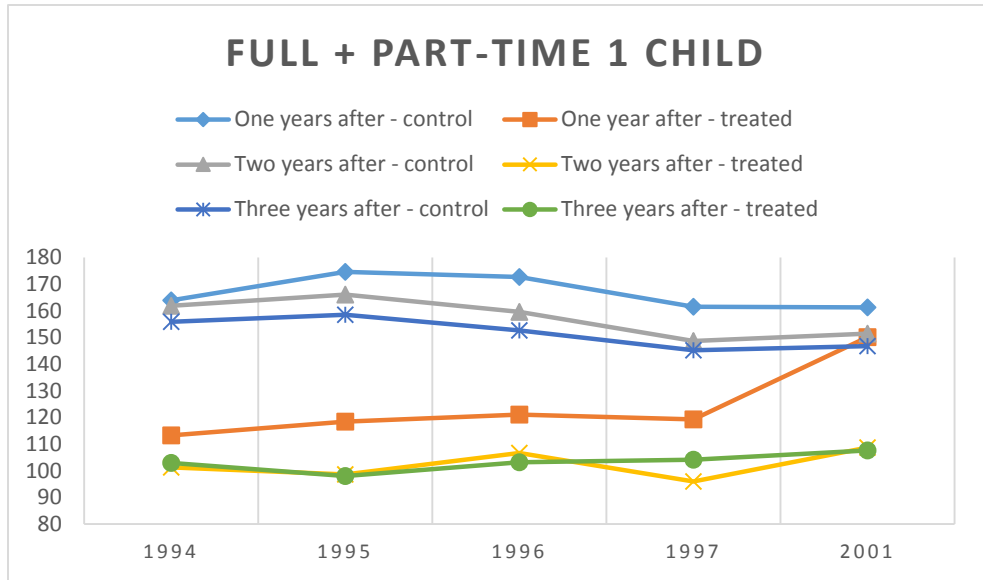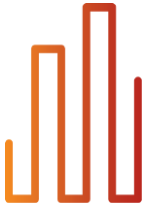|	Before the introduction of the policy (1997)			After the introduction of the policy (2001)			
Outcome variable	Control (	Treatment (one	Difference	Control	Treatment	Difference	DIFF-IN-DIFF
Full-time							
No of hours worked one year after the reference year							
Mean	168.376	124.962	-43.414***	169.155	156.68	-12.475***	30.939***
Std. error	2.887	3.562	2.223	2.946	3.568	2.148	3.057
No of hours worked two years after the reference year							
Mean	162.713	108.847	-53.865***	166.295	123.306	-42.989***	10.877***
Std. error	3.339	4.120	2.571	3.407	4.127	2.484	3.536
No of hours worked three years after the reference year							
Mean	163.806	121.644	-42.162***	166.158	126.046	-40.112***	2.050
Std. error	3.339	4.120	2.571	3.407	4.127	2.484	3.536
N	7391	393		8498	420		
Non-marginal part-time							
No of hours worked one year after the reference year							
Mean	111.293	83.071	-28.222***	117.354	105.976	-11.378***	16.845
Std. error	12.437	14.998	8.677	12.817	14.977	8.621	12.122
No of hours worked two years after the reference year							
Mean	139.111	96.122	-42.989***	142.054	101.513	-40.541***	2.448
Std. error	13.864	16.718	9.672	14.287	16.695	9.610	13.513
No of hours worked three years after the reference year							
Mean	151.226	114.673	-36.553***	150.693	112.133	-38.560***	-2.007
Std. error	14.164	17.080	9.882	14.597	17.057	9.818	13.806
N	647	40		705	40		

Conclusions

- On average, the introduction of the policy had a positive effect on the number of hours worked.

- The effect of the policy is notable during two years after childbirth for single-child mothers and during three years following the childbirth for mother of two children.

- The introduction of the parental leave policy had a heterogeneous response between full-timers and part-timers (only mother of a single-child analyzed). The effect of the policy was stronger among full-timers than among part-timers (however, the results should be interpreted with caution due to low number of observations among part-timers).
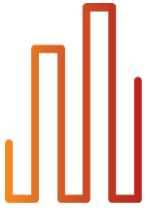
Common trend assumption

- Potential source of bias due to non-compliance with the common trend assumption was addressed. The common trend assumption stipulates that in the absence of the treatment, the outcome for treated (mother with one or two children) and control (childless women) groups should have evolved in parallel.

- A placebo estimation was conducted placing the fictive introduction of the policy in 1997. We re-estimated DID for each of the pre-treatment year (i.e. 1994-1996) and year 1997. The insignificant difference in difference then indicates that there is no significant difference in outcomes for analyzed pre-treatment years, thus the outcome trends between treatment and control group are the same.

Sensitivity analysis

- We re-estimated the impact of the introduction of the policy on a more homogenous sample for women aged 25-35 years (instead of 18-38 years) to verify whether our original age selection could have affected the results.

  - The results of this test reveal that the impact of the policy in this more restricted subgroup of women is very close to the one presented for a broader age category of women. This indicated that, on average, our conclusions have not been affected substantially by the choice of age range.

- We re-estimated our models also using log of number of hours worked. The results are in line with general findings of the paper.
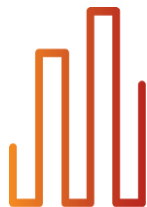
Limitation

- Problem of missing variables in the model such as: education, partners' characteristics, occupation at childbirth, work-family preferences and attitudes. However, the pre- and post-treatment period are not too distant from each other to allow for substantial changes in group composition regarding these variables.

- Sample of analyzed mothers restricted only to those with children born in particular time (for a single child) and in particular sibling constellation (for two children). Thus, potential problem with external validity and possibility to generalize.

- Trimestrial nature of the data – source of inprecision.

- Problems with some available variables: e.g. occupation.

- More?
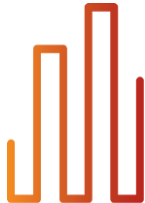
THANK YOU

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