The impact of an EITC on maternal labour supply in the Netherlands

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Abstract

I study the impact of an EITC for secondary earners and single parents in the Netherlands. A regression discontinuity and a difference-in-discontinuity approach suggest that the labour participation and hours worked of single mothers and mothers in couples are not significantly affected. This is supported by an extensive robustness analysis. The small effects can be due to the relatively old age of the children of the women in the treatment group, who typically have a lower labour supply elasticity than women with younger children. However, data limitations prevent me from drawing firm conclusions.

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1 Introduction

In recent years, there has been considerable policy focus to raising female labour force participation in the Netherlands. Although the share of women with a paid job has risen sharply in the last decades, it still lags behind the share of men in paid jobs. Moreover, the majority of working women have part-time jobs (SCP, 2008). Nowadays the '*Combinatiekorting*' ('Combination credit') – an earned income tax credit (EITC) for single parents and secondary earners with young children – is one of the main policies addressing these issues. This tax credit, introduced in 2001, was available to all working parents with a youngest child up to 12 years of age. Its main aim was to support parents in the combination of work and care, but over the years the EITC evolved primarily as a measure to stimulate mothers to work more. In particular the expansion in 2004, which doubled the tax credit for single parents and secondary earners with children up to 12 years of age, contributed to that. Eventually, the tax credit was made income dependent and primary earners were excluded.

In this thesis I examine the causal impact of the Combination credit on labour supply of mothers. Using data from the Labour Force Survey of Statistics Netherlands for the period 1996-2009, I employ a regression discontinuity design. The age of the youngest child, which determines eligibility to the EITC, is used as the cutoff. A working mother with a child that turned 12 after January 1 is eligible, a working mother with a child that turned 12 before is not. Accordingly, I consider working mothers with a youngest child 10-11 years of age as the treatment group, and working mothers with a child aged 12-13 as the control group.

Labour supply theory predicts that the tax credit will encourage labour force participation for both single parents and secondary earners in the treatment group, since after-tax labour income increases due to the tax credit. Any parent who preferred working before will still prefer to work in the presence of the credit, and some parents may find that the additional after-tax income from the tax credit makes it worth entering the labour force. The effects on hours worked are more ambiguous and depend highly on the specific features of the EITC. Up to 2008, the tax credit

considered in this thesis will only produce an income effect for the mothers who are already working. Giving them an incentive to reduce their hours worked. For 2009 there is both an income effect and a substitution effect since the tax credit became income dependent in that year. Therefore the effect on hours worked is ambiguous for 2009 (my last year of observation).

My RD analysis shows that the EITC has a small insignificant impact on the participation margin of single mothers. For mothers in couples the effects on labour participation are similarly small and insignificant. A number of robustness checks give similar results.

These findings are at odds with the sizable labour supply responses found in related studies. Meyer (2010), which provides a summary of the studies investigating the introduction and subsequent expansions of the Earned Income Tax Credit (EITC) in the US, concludes that the weight of evidence indicates that the credit has sharply increased the fraction of single mothers who work. Eissa and Liebman (1996), one of the earlier studies, use a difference-in-difference approach to conclude that the expansion of the EITC in 1987 increased labour force participation among single women with children by up to 2.8%-points. Among those with less than high school the impact was even greater – 6.1%-points. These findings are supported by Meyer and Rosenbaum (2001) who study the expansions between 1984 and 1996. They find the employment of single mothers in 1996 to be 7.1%-points higher because of the EITC.

In the US most single parents who were already working were on the flat or phased-out section of the credit schedule, therefore most of them only experienced an income effect (Meyer, 2010). Yet, the theoretical predication that hours worked of single parents would decline is not confirmed by the data. The lack of this "hours effect" is a robust finding in the literature (Eissa and Liebman (1996); Meyer and Rosenbaum (2001); Meyer (2002); Eissa and Hoynes (2006)).

Furthermore, the impact of the EITC on labour force participation and hours worked of secondary earners is found to be negative (Eissa and Hoynes, 2004). However, this is primarily a result of the specific design of the EITC in the US. The

level of tax credit is based on family earnings, which creates a strong labour supply disincentive for secondary earners close to the phase-out section (Meyer, 2010). The EITC examined in this thesis contains no such disincentive for secondary earners.

Another set of studies examine the impact of the introduction of the Working Families' Tax Credit (WFTC) in 1999 in the UK. The findings of these studies are reviewed by Brewer and Browne (2006). They conclude that the WFTC seems to have induced single mothers to increase their participation by around 5%-points between 1999 and 2002. There is, however, some variation in findings between the different studies. Leigh (2005) finds an insignificant increase in participation of 0.6%-points. Blundell, Brewer and Shephard (2005) find a larger 3.6%-points increase, Gregg and Harkness (2009) report an impact of 5%-points and Francesconi and Van Der Klauw (2007) find the largest increase in participation of 7%-points.

The WFTC also increased the hours worked by single mothers between 1998 and 2002. Gregg & Harkness (2009) estimate an increase of 2.5 hours per week, Brewer et al. (2005) report a somewhat lower increase of 1.8 hours per week.

Like the EITC in the US, the WFTC also creates a labour supply disincentive for secondary earners close to the phase-out section. Despite this, the evidence on the impact of the participation rate of mothers in couples is mixed. Brewer et al. (2005) find small negative effects while Blundell et al. (2005) find large positive effects, varying from 2.6%-points to 4.3%-points. In addition, there is no evidence that the WFTC has significantly reduced hours worked amongst workers in couples (Brewer and Browne, 2006).

Most studies find substantial labour supply effects, while I find small and insignificant results. There are several potential explanations for this discrepancy with the literature. First, this study has some data limitations. Especially the noise around the cutoff has the potential to bias the treatment effect downward. Second, the tax credit might have been too small to generate a significant labour supply response. Third, I consider women with relatively old children, which typically have a lower labour supply elasticity than women with younger children. Fourth, in this study mothers previously in the treatment group can end up in the control group

in later years, which can bias the treatment effect downward. Finally, there could be restrictions that prevent mothers from realizing their labour supply preferences. For instance, demand restrictions or social restrictions. In section 6 I discuss the appropriateness of these explanations in more detail.

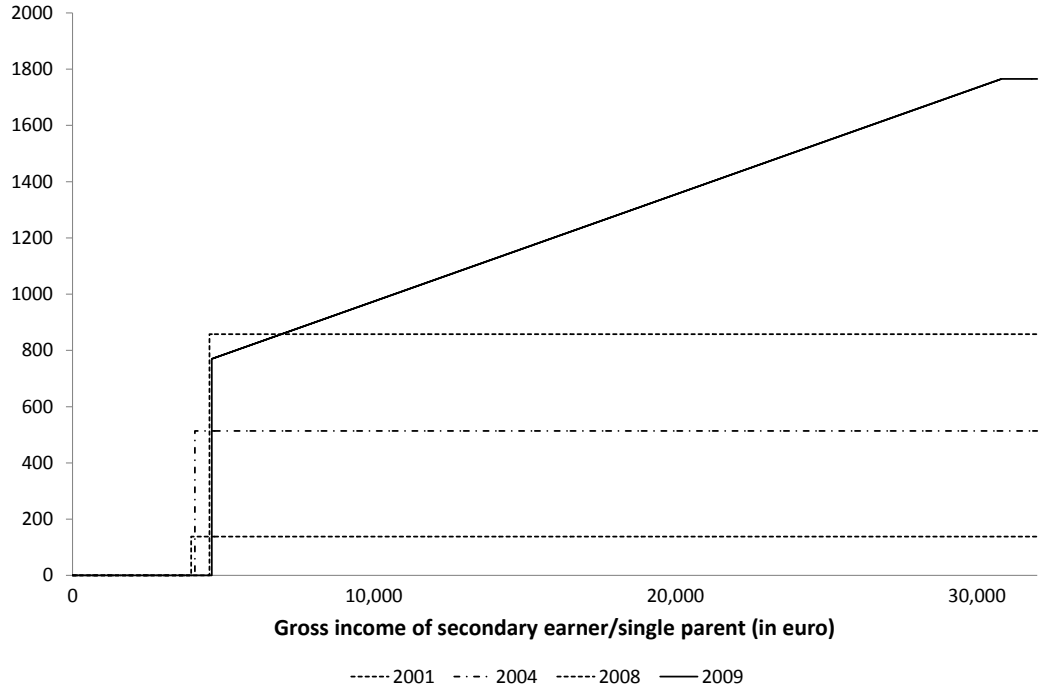
The outline of this thesis is as follows. Section 2 explains the structure of the tax credit and considers its theoretical implications. Section 3 describes the methodology and estimation methods. Section 4 discusses the data and presents descriptive statistics. Section 5 presents the results of the analysis and a number of robustness checks. Finally, section 6 discusses the findings and concludes. Supplementary material is included in an appendix.

2 The Tax Credit

The term "EITC" that I have used so far is imprecise. In fact, there have been three different earned income tax credits over the course of the period I consider (see appendix A.16), starting with the introduction of the '*Combinatiekorting*' ('Combination credit') in 2001. This tax credit was supplemented with the '*Aanvullende combinatiekorting*' ('Additional combination credit') in 2004. Eventually, both credits were replaced by the '*Inkomensafhankelijke combinatiekorting*' ('Income dependent combination credit') in 2009. Although they all shared the aim of supporting parents in the combination of work and care, there were some differences in eligibility criteria between these credits. Most notably, the Additional combination credit and the Income dependent combination credit were only available to single parents and secondary earners, while the Combination credit was also available to primary earners. In addition, all three credits required (1) earned income to be above a certain threshold and (2) a child under the age of 12 who lives with the taxpayer for more than one-half of the tax year.

The income threshold for the Combination credit in 2001 was set at €3,938 (about 30% of the minimum wage). All parents with a qualifying child and income above that threshold were entitled to the Combination credit of €138. This amount

Figure 1: Tax credit for secondary earners and single parents (in euro)



Source: Bettendorf, Jongen & Muller (2015) and wetten.overheid.nl.

Table 1: Public spending on the tax credit (millions of euro)

Year	2002	2003	2004	2005	2006	2007	2008	2009
EITC for parents	410	460	738	830	871	984	971	1,290
- Combination credit	410	460	479	484	314	324	247	0
- Additional combination credit	0	0	259	346	557	660	724	0
- Income dependent combination credit	0	0	0	0	0	0	0	1,290

Source: Bettendorf, Jongen & Muller (2015).

increased somewhat over the years, but it remained a small share of yearly income. In 2004, when the Additional combination credit was introduced, the combined amount of both tax credits amounted to €514. This further increased till 2008 to a combined amount of €858. In 2009 both tax credits were replaced by the Income dependent combination credit. The maximum credit more than doubled to €1,765

which was obtained by a gross income of €30,803. For lower incomes the tax credit amounted to a fixed €770 and in addition 3.8% for every euro of gross income in excess of €4,619. Figure 1 summarizes the changes in the tax credit.

The expansions of the EITC are also reflected in the budgetary outlays of the government (Table 1). Total expenditures on the EITC increased from €410 million in 2002 to €1.3 billion in 2009. Note that this is not all targeted at single parents and secondary earners – part of expenditures on the Combination credit are going to primary earners. But over time, as the Combination credit decreased in importance, the share going to primary earners declined as well. Especially the introduction of the Additional combination credit in 2004 increased the share of the expenditures going to single parents and secondary earners. After the changes in 2009, the full €1.3 billion was targeted at this group, which I consider as the treatment group.

The theoretical effect of the EITC on labour force participation rate is unambiguously positive[1]. The EITC increases the after-tax return to work at all earning levels. Thus, someone who preferred working before will still prefer working, and some taxpayers may find that the additional after-tax income from the tax credit makes it worth entering the labour force. The EITC is therefore expected to lead to an increase in labour force participation.

The theoretical impact on hours worked is mostly expected to be negative. This is illustrated in Figures 2a-d. Figure 2a depicts the situation before the introduction of the EITC. The indifference curve is tangent to the budget constraint at the point where the individual does not participate in the labour force. After the introduction of the EITC, the budget constraint changes from BI to BEFG in Figure 2b. By comparing point B with point F, one can see that a higher indifference curve can be obtained by entering the labour force.

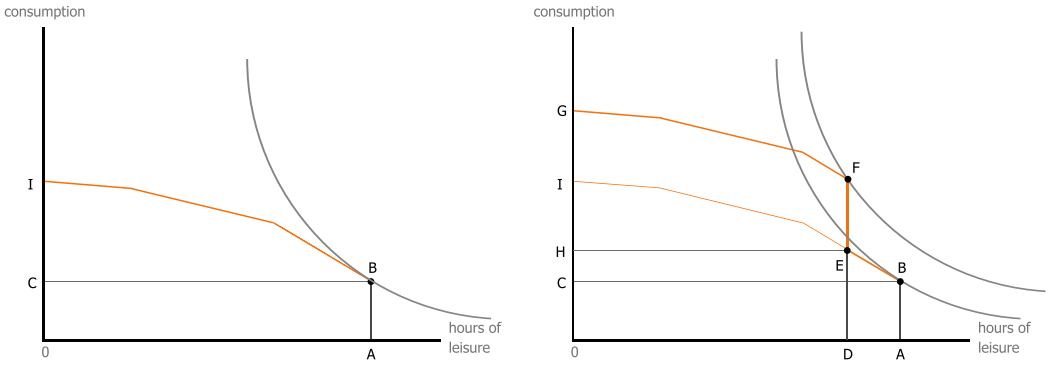
Figure 2c depicts the income dependent EITC which was in place in 2009. The impact on the participation margin (not drawn) is the same as in Figure 2b. However, the theoretical impact on hours worked is different now. The change in budget

[1]The Combination credit of primary earners may in theory reduce participation of secondary earners via a (family) income effect. However, the Combination credit was never higher than €228 per year, therefore I regard this effect to be negligible.

Figure 2: The theoretical effects

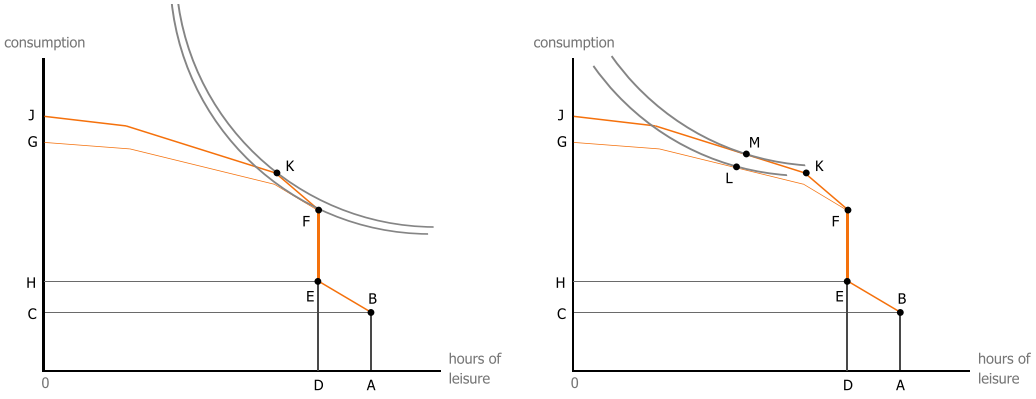
(a) Without EITC

(b) With constant EITC



(c) With income dependent EITC

(d) With income dependent EITC



constraint from BEFG to BEFKJ creates both an income effect and a substitution effect[2]. The theoretical effect on hours worked is therefore ambiguous. In Figure 2c the substitution effect dominates the income effect so that hours worked will increase (compare point F with point K). In Figure 2d I show the case of a dominant income effect which results in a decrease in hours worked (compare point L with point M). For higher incomes (above €30,803), the tax credit is constant again so that there is only an income effect.

[2]The income effect, reflected by the higher budget constraint, states that more income raises demand for leisure (reduces hours worked) under the assumption that leisure is a normal good. The substitution effect, reflected by the steeper budget constraint in Figure 2c-d, states that an increase in after-tax wages makes work more attractive relative to leisure. This increases hours worked.

It is important to emphasize that in the empirical analysis on hours worked, both the intensive and extensive margin are observed, not just the intensive margin as the theoretical model might suggest. Hence, a change in hours worked in the empirical model can be the result of both a change at the participation margin and/or a change in hours worked. Consequently, the expected theoretical effect on hours worked cannot be verified directly with this empirical model[3].

3 Methodology

I use a regression discontinuity (RD) model to estimate the impact of the EITC on labour force participation and hours worked. The RD approach assumes that the outcome variable is continuously related to the age of the youngest child in the absence of the EITC (Angrist and Pischke, 2009). The idea is that the tax credit introduces a discontinuity in the outcome variable at the cutoff. The size of the discontinuity is then interpreted as the causal effect of the tax credit. Identification comes from comparing mothers with a youngest child just younger than the cutoff age of 12 with mothers with a child just older than the cutoff age. More specifically, I consider mothers with a youngest child 10 or 11 years of age as my treatment group, the control group consists of mothers with a youngest child 12 or 13 years of age.

The RD approach is only valid when (1) assignment to either the treatment or the control group is exogenous so that both the treatment and control group have the same characteristics and (2) that at the cutoff all other variables are continuously related to the participation rate and (3) there are no other discontinuities (in policies) at the threshold (Imbens and Lemieux, 2008).

This first assumption can be tested by comparing the individual and household characteristics in the treatment and control group (Table 2). At first sight, there are no sizable differences, except for the age of the mother. Mothers in the control group are on average 2 years older by construction. Therefore, omitted variables

[3]This could be done with a Heckman selection model (Heckman, 1979)

correlated with age of the mother and the outcome variables can pose a threat to the analysis. Furthermore, Figure A.3a-b shows that there is no apparent jump around the cutoff in the density distribution. Consequently, anticipation effects do not seem to be a major problem in the analysis.

To informally test the second assumption I graph all control variables (see Figure A.1a-m and Figure A.2a-m). The graphs show no particularly large discontinuities for either single mothers or mothers in couples. However, the formal test in Table A.15 indicate that for some control variables – in particular those related to age of the mother – there is a significant jump at the cutoff. Again, this is problematic if there are omitted variables correlated with both (the jumps in) these control variables and the outcome variables. In addition, I did find four policies that can potentially influence the treatment and control group differently.

First, the *'Kinderopvangtoeslag'* ('Child-care allowance'). This allowance is available to parents who both work and have children under the age of 12 in formal child-care. It is of special importance because both the allowance and the EITC became more generous over the years 2006-2009. However, the extent to which this affects the treatment and control group differently seems modest. Data of Statistics Netherlands show that of the children aged 10 to 11, which is my primary treatment group, only 2-7% were in formal child-care (CBS, 2014). In the analysis it is impossible to disentangle the effect of the EITC from that of the child-care allowance. Therefore, the treatment effect is, if anything, biased upward by the Child-care allowance. However, most of the effect is likely to be attributable to the changes in the EITC.

Second, the *'Aanvullende alleenstaande ouderkorting'* ('Additional single parent credit'). This tax credit, introduced in 2001, was specifically aimed at single parents with a child up to 12 years of age. In 2002 the age limit was raised to 16, therefore it had no longer an differential impact on my treatment and control group from 2002 onwards. Hence, I exclude the year 2001 from my analysis on single mothers, to correct for this change[4].

[4]Inclusion of 2001 does not affect the treatment effects significantly. Overall the estimates are somewhat lower with 2001 included.

Third, in the Netherlands all parents get an allowance to support in the costs of children, called the *'Kinderbijslag'* ('Children's allowance'). The size of the allowance depends on the age of the eligible children. The standard allowance is around €250 per quarter per child, which is received only if the child is between 12-18 years. For every younger child, 85% of the standard allowance is received. More specifically, since I am able to control for the number of children in a household the allowance will be up to €150 higher in what I consider as my control group[5]. The income effect, following from the higher allowance, reduces the hours worked and the participation rate in the control group. Hence, the treatment effect is upwardly biased.

Fourth, most children aged 12 move from primary education to secondary education. This can potentially affect the labour supply of parents in the treatment and control group differently. For example if the move to the secondary school is perceived as a first step to more responsibility for children, a parent is perhaps more inclined to work more. Using data prior to the introduction of the EITC, I am able to show that this effect on the participation rate is insignificant and close to zero (Table A.3 and A.10). Point estimates for the effect on hours worked are also insignificant.

I use a linear probability model to explain the binary outcome variable labour force participation and a linear model to explain the hours worked. I regress both outcome variables Y_{it} of individual 'i' on a year fixed effect (β_t), age of the youngest child in years ($\beta_{agechild}$), a treatment effect that applies if the youngest child is younger than 12 years of age and that captures the discontinuity (β_{RD}), an interaction term that allows me to have a different slope for the age of the youngest child after the cut-off ($\beta_{agechild\geq 12}$) and several control variables (X_{it}) The control variables are included to improve the efficiency of the estimates.

$$\begin{aligned} Y_{it} &= \beta_t + \beta_{agechild} agechild_{it} + \beta_{RD}(agechild < 12) \\ &+ \beta_{agechild\geq 12}(agechild \geq 12) agechild_{it} + X_{it}\gamma + \epsilon_{it} \end{aligned} \tag{1}$$

[5]The difference in allowance between children under age of 12 and 12 or older, is per year ((1-0,85) x 250) x 4 = €150

The error term (ϵ_{it}) is assumed to satisfy the Gauss-Markov assumptions. However, the Breusch-Pagan test strongly rejects the null hypothesis of homoskedasticity for both outcome variables. Therefore I report robust standard errors.

In some models I use a slightly different specification, including a quadratic trend or excluding the different slope after the cutoff. As a second approach I use what is coined a difference-in-discontinuity design (Bettendorf et al., 2014). With the pre-reform data I am able to estimate the change in the discontinuity for both the participation rate and the hours worked.

$$\begin{aligned} Y_{it} = \beta_t + \beta_{PRD}(agechild < 12) + \beta_{DRD}(agechild < 12)(year \geq 2001) \\ +\beta_{agechild} agechild_{it} + \beta_{agechild \geq 12}(agechild \geq 12) agechild_{it} + X_{it}\gamma + \epsilon_{it} \end{aligned} \tag{2}$$

The pre-reform discontinuity is captured by β_{PRD}, the post-reform discontinuity relative to the pre-reform discontinuity is captured by β_{DRD}. The total post-reform discontinuity is therefore $\beta_{PRD} + \beta_{DRD}$.

Unfortunately, the data do not allow me to distinguish between mothers in couples who are secondary earners and who are therefore eligible to the EITC and mothers in couples who are primary earners and who are therefore not eligible to the EITC. Hence I estimate an intention-to-treat effect for mothers in couples.

4 Data

I make use of the Dutch Labour Force Survey ('*Enquête Beroepsbevolking*') of Statistics Netherlands. This annual survey contains information on labour force participation, individual and household characteristics for at least 80,000 individuals per year. The individual and household characteristics include: age of the mother, education (low, medium and higher), ethnicity (native, western immigrant and non-western immigrant), number of children under 18 in the household (one, two, three and more than three) and the number of adult children in the household (zero, one, two and three or more).

Combining this survey data for the period 1996-2009 gives me a repeated cross-

Table 2: Descriptive statistics on the treatment and control group

	Difference in means for single mothers (treatment-control)		Difference in means for mothers in couples (treatment-control)	
	1996-2000	2001-2009	1996-2000	2001-2009
Participation rate	-0.008	-0.032	-0.010	-0.008
Hours worked	-1.079	-1.801	-0.751	-0.669
Age of the mother	-2.084	-1.986	-1.626	-1.612
Higher education	-0.030	0.005	0.025	0.000
Medium education	0.006	0.014	0.013	0.017
Lower education	0.024	-0.020	-0.038	-0.017
Native	0.014	-0.014	-0.007	-0.008
Western immigrant^A		-0.003		0.004
Non-western immigrant^A		0.017		0.004
One minor child	-0.075	-0.067	-0.092	-0.064
Two minor children	0.032	0.024	-0.027	-0.041
Three minor children	0.038	0.035	0.100	0.083
Four or more minor children	0.005	0.008	0.020	0.022
No adult children	0.051	0.076	0.094	0.109
One adult child	-0.036	-0.065	-0.068	-0.085
Two adult children	-0.011	-0.009	-0.020	-0.021
Three or more adult children	-0.004	-0.002	-0.006	-0.003
Observations 2001-2009	12.578		78.359	

Source: Labour Force Survey (Statistics Netherlands). ^{A}For 1996-2000 data on western and non-western immigrants were unavailable.

section with in total more than 1.5 million observations. The EITC was first introduced in 2001, so that I have 5 years of data prior to the introduction and 9 years of data after the introduction. The data prior to the introduction are used in a placebo RD analysis (see table A.3 and A.10).

I restrict the primary analysis to mothers aged 26-57 with a youngest child between 10-13[6]. The treatment group therefore consists of mothers with a youngest

[6]The age limit of the mother is set to prevent the analysis to be affected by early retirement

child aged 10 or 11 and the control group consists of all mothers with a youngest child aged 12 or 13.

Table 2 depicts the descriptive statistics of the treatment and control group over the relevant sample period, seperately for single mothers and mothers in couples. The table shows that there are no large difference between the treatment and control group, except for age and variables related to age of the mother. For instance the share of adult children in the treatment group is substantially lower. In the empirical analysis I try to control for these differences by including these variables as controls. In most other respects, like education and ethnicity, the treatment and control group are very similar.

There are three major downsides to the dataset I am using. First, I am not able to observe the exact birth date of the youngest child. The age of the youngest child is determined at the survey date[7]. Consequently, some parents with a child just under 12 years before January 1 will receive the EITC, while in fact they are assigned to the control group based on the observed age at the survey date. Second, some mothers who were first in the treatment group will end up in the control group in later years. This causes problems if the EITC has a career effect. Third, there are no data available on who actually received the EITC. This is problematic for mothers in couples because I cannot rule out whether they are secondary earners, and therefore eligible to the EITC, or primary earners and therefore not eligible. This problem does not occur for single mothers. Consequently, I am only able to estimate an intention-to-treat effect for mothers in couples. In the next sections I consider ways to address some of these concerns.

5 Results

I will present the results on single mothers and mothers in couples, separately for three reasons. First, single mothers might respond different to the EITC than

benefits.

[7]Statistics Netherlands conducts the surveys every 3 months so that about 50% of all 12 year olds are wrongly assigned to the control group when in fact they belong to the treatment group.

mothers in couples, since they do not have to consider the labour supply decision of their partner. Second, there is a policy reform affecting solely single mothers. Third, for single mothers I observe the actual treatment effect on the treated while I am only able to estimate an intention-to-treat effect for mothers in couples.

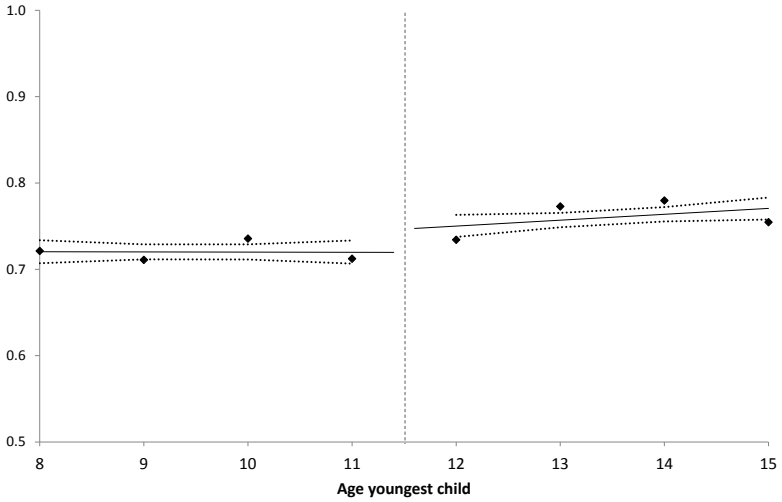
5.1 Single mothers

First, I present an eyeball test. Figure 3a shows the relation between the participation rate of single mothers and the age of the youngest child in years. In figure 3b the outcome variable is hours worked. The single mothers to the left of the cutoff, marked by the vertical line, still qualify for the EITC, while mothers to the right do not. Hence I expect the participation rate to be higher just before the cutoff age of 12. Instead, figure 3a shows a drop in the participation rate at the age of 11, creating a discontinuity of opposite sign. Figure 3b on hours worked shows a similar result. In what follows, I examine this result more closely using regression analysis.

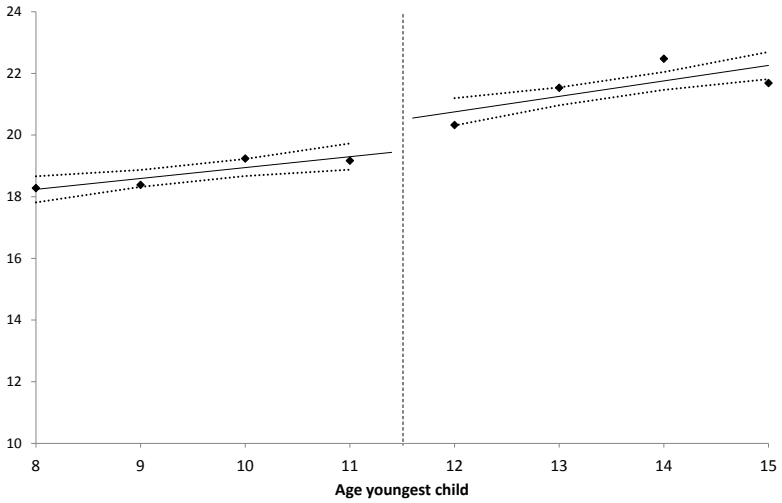
Table 3 presents a first attempt to do so by estimating variants of equation (1) for the participation rate. In column (1) I present the results for the treatment effect without controlling for time and demographic differences. This specification assumes that the relationship between participation rate and the age of the youngest child has a similar slope to the left and the right of the cutoff. With this specification I find a negative treatment effect of -1.5%-points, indicating that single mothers who receive the EITC appear to have a lower participation rate. To allow for a more flexible relation I add a quadratic term, yielding the results in column (2). The quadratic term is highly significant, but it hardly affects the size, significance and the sign of the treatment effect. In column (3) I allow for a different slope to the right of the cutoff by adding an interaction between age of the youngest child and a dummy which is 1 if the child exceeds the cutoff age of 12. The slope to the right of the discontinuity is significant at the 1% level, causing the sign of the treatment effect to switch to a positive 1.7%-points. However, the treatment effect remains insignificant. Furthermore, when I add controls to the specification of column (3), yielding the model in column (6), the treatment effect becomes larger

Figure 3: The participation rate and hours worked for single mothers

(a) Participation rate



(b) Hours worked



Source: Labour Force Survey (Statistics Netherlands)

Table 3: Participation rate for single mothers

	Without controls			With controls		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.015	-0.014	0.017	-0.014	-0.013	0.024
	(0.018)	(0.018)	(0.020)	(0.017)	(0.017)	(0.019)
Age youngest child	0.007	-0.008	-0.023**	0.017**	-0.001	-0.020*
	(0.008)	(0.009)	(0.011)	(0.008)	(0.008)	(0.011)
Age youngest child^2		0.015***			0.019***	
		(0.004)			(0.004)	
Age youngest child x (age y. child >11)			0.062***			0.074***
			(0.016)			(0.015)
Year fixed effects	No	No	No	Yes	Yes	Yes
Observations	12,143	12,143	12,143	12,143	12,143	12,143

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included if indicated.

but remains insignificant. In fact, adding controls result in a higher treatment effect across all specifications. For the model in column (4) the treatment effect is less negative and the specification in column (5), which adds a quadratic term, yields also a less negative treatment effect. In column (6), the slope to the right of the cutoff is estimated with considerable uncertainty, so that the treatment effect is less reliable. Hence, I prefer the specifications of columns (4) and (5) with an insignificant treatment effect on participation of -1.4%-points and -1.3%-points respectively.

In Table 4 I consider the impact on hours worked of single mothers. In column (1) the treatment effect is an insignificant -0.445 hours per week. Adding a quadratic term in column (2) does not change that substantially in terms of size and significance. However, allowing for a different slope to the right of the discontinuity in column (3) results in a positive, though insignificant effect on hours worked. Again, the preferred specifications are (1) and (2) with a treatment effect of -0.445 and -0.414 hours per week respectively.

I study the hours worked of single mothers for 2009 separately. The table shows that, across the different specifications, single mothers worked substantially less

Table 4: Hours worked for single mothers

	Period: 2002-2008			Period: 2009		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.445	-0.414	0.425	-1.554	-1.690	-0.920
	(0.613)	(0.613)	(0.678)	(1.463)	(1.469)	(1.554)
Age youngest child	0.971***	0.573*	0.153	0.373	-0.088	-0.473
	(0.269)	(0.294)	(0.369)	(0.673)	(0.792)	(1.011)
Age youngest child^2		0.420***			0.385	
		(0.134)			(0.335)	
Age youngest child x (age y. child >11)			1.679***			1.540
			(0.535)			(1.340)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,454	10,454	10,454	1,689	1,689	1,689

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

hours in 2009. The estimated treatment effects range from -1.690 to -0.920 hours per week, presumably reflecting a stronger income effect. The effects on participation in 2009 (Table A.1) are quite low, suggesting that the hours effect is due to a change in the intensive margin.

Table 5 presents the results of the difference-in-discontinuity analysis (equation (2)). Using the full sample period 1996-2009, I estimate how the discontinuity in the participation rate and the hours worked changes after the introduction of the EITC compared to the pre-intervention period. From column (1) it is clear that the pre-intervention discontinuity is positive but insignificant for the participation rate. The results on the post-intervention discontinuity – indicated by treatment effect x (year $\geq$ 2001) – suggest that the introduction of the EITC actually reduces the participation of single mothers in the treatment group by 3.8%-points compared to the pre-reform period. The negative post-intervention discontinuity is insignificant. Furthermore, it can be seen from column (2) that allowing for a different slope to the right of the cutoff, makes the pre-intervention discontinuity significant. The

Table 5: Difference-in-discontinuity for single mothers

	Outcome variable: participation rate		Outcome variable: hours worked	
	(1)	(2)	(3)	(4)
Treatment effect	0.023	0.060**	0.696	1.477
	(0.027)	(0.028)	(0.899)	(0.931)
Treatment effect x (year $\geq$ 2001)	-0.038	-0.039*	-1.196	-1.221
	(0.024)	(0.024)	(0.805)	(0.805)
Age youngest child	0.017**	-0.018	0.947***	0.216
	(0.007)	(0.010)	(0.238)	(0.328)
Age youngest child x (age y. child >11)		0.070		1.484***
		(0.014)		(0.473)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	13,755	13,755	13,755	13,755

Sample period 1996-2009, excluding 2001. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

post-intervention discontinuity, which I expect to be positive, remains negative. A similar pattern arises from the hours worked decision of single mothers. In column (3) and (4) I show that mothers who receive the EITC in the post-reform period tend to work less hours relative to the pre-reform period.

An extensive robustness analysis is provided in the appendix. First, Table A.1 and Table A.2 present the biannual regression results for the participation rate and the hours worked respectively. The results confirm that the discontinuity is small and insignificant for most years. The exception is 2007-2008. In this period both hours worked and participation rate increased significantly in the treatment group. However, for 2009 the point estimates are negative again for both outcome variables. Table A.3 shows the results of a placebo RD regression on the pre-intervention period 1996-2000. I find a positive but insignificant discontinuity for the participation rate and the hours worked, which is in line with the difference-in-discontinuity analysis. If 12 year olds are included in the control group the treatment effect is larger, hence the noise around the cutoff age seems to bias the treatment effect upward (compare

Table 3 and 4 with Table A.4). Table A.5 shows that allowing for a wider bandwidth around the cutoff yields a similar small, negative treatment effect as before. When I run the analysis for several subgroups of single mothers, it yields mostly negative and insignificant results, as can be seen from Table A.6 and Table A.7.

5.2 Mothers in couples

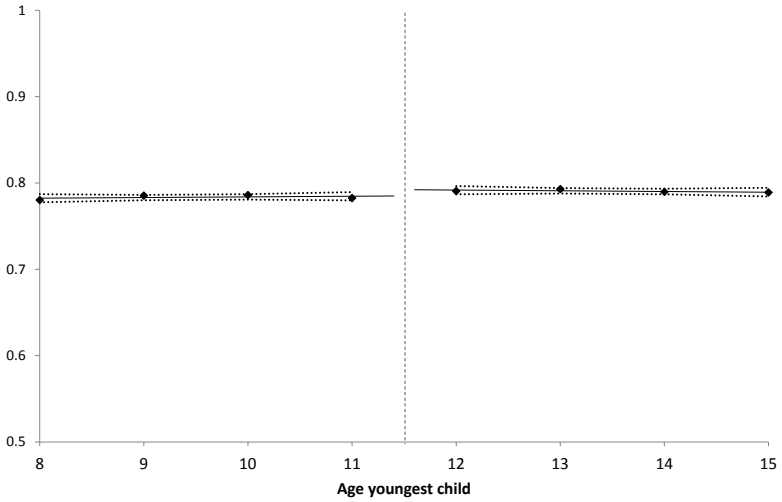
For mothers in couples I perform a similar RD analysis. Figure 4a and 4b show that there is hardly a jump in the participation rate and hours worked at the cutoff. This is further investigated in the formal analysis below.

Table 6 shows that across all specifications the treatment effect is negative but close to zero and insignificant. Indicating that the participation of mothers in couples is hardly affected by the EITC. The impact on hours worked also appears to be close to zero. The exception is 2009 for which the hours worked declined by between 0.815 till 0.859 per week (see Table 7). However, none of these results are significant. When I compare the discontinuity of the post-intervention period relative to the pre-intervention period I obtain the results in Table 8. They suggest that the participation rate is slightly larger after the introduction of the EITC. This also holds for the hours worked by mothers in couples.

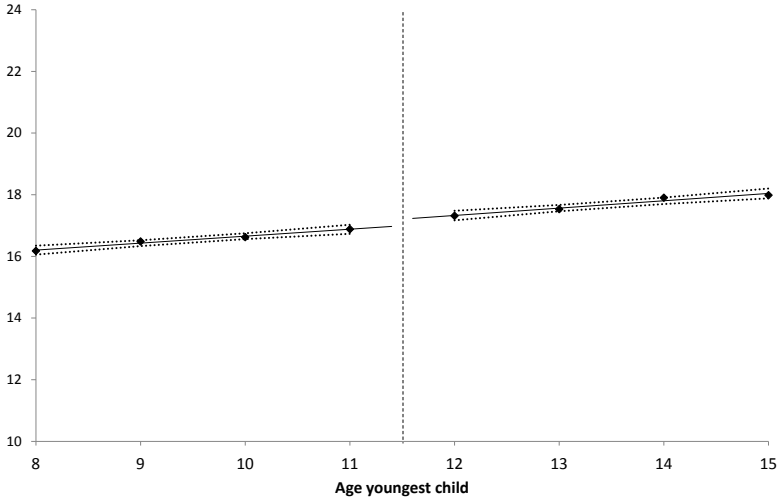
An extensive robustness analysis is given in the appendix. Table A.8 and A.9 presents the biannual regression results for both the participation rate and hours worked of mothers in couples. The results show no clear time pattern; most results are small, sometimes positive but mostly negative. The only exception is the period 2001-2002 where the treatment effect is large and negative. This, however, is unlikely due to the EITC since the credit was relatively small back then. Table A.10 contains the placebo RD analysis on the pre-intervention period. It shows positive but insignificant results for the participation rate and small insignificant results for the hours worked. In addition, using a different control group (Table A.11), allowing for a wider bandwidth around the cutoff (Table A.12) or doing separate regressions for different subgroups (Table A.13 and A.14) yields similar insignificant treatment effects.

Figure 4: The participation rate and hours worked for mothers in couples

(a) Participation rate



(b) Hours worked



Source: Labour Force Survey (Statistics Netherlands)

Table 6: Participation rate for mothers in couples

	Without controls			With controls		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.009	-0.009	-0.006	-0.008	-0.008	-0.001
	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)
Age youngest child	-0.001	-0.002	-0.003	0.006**	0.003	-0.000
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Age youngest child^2		0.001			0.003**	
		(0.001)			(0.001)	
Age youngest child x (age y. child >11)			0.006			0.013**
			(0.006)			(0.006)
Year fixed effects	No	No	No	Yes	Yes	Yes
Observations	78,359	78,359	78,359	78,359	78,359	78,359

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included if indicated.

Table 7: Hours worked for mothers in couples

	Period: 2001-2008			Period: 2009		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.087	-0.085	-0.041	-0.815	-0.815	-0.859
	(0.211)	(0.211)	(0.233)	(0.567)	(0.567)	(0.617)
Age youngest child	0.450***	0.429***	0.407***	0.517**	0.539*	0.561
	(0.095)	(0.105)	(0.132)	(0.252)	(0.281)	(0.354)
Age youngest child^2		0.022			-0.022	
		(0.047)			(0.124)	
Age youngest child x (age y. child >11)			0.088			-0.088
			(0.189)			(0.496)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	68,797	68,797	68,797	9,562	9,562	9,562

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table 8: Difference-in-discontinuity for mothers in couples

	Outcome variable: participation rate		Outcome variable: hours worked	
	(1)	(2)	(3)	(4)
Treatment effect	-0.010	-0.005	-0.390	-0.381
	(0.010)	(0.011)	(0.304)	(0.315)
Treatment effect x (year $\geq$ 2001)	0.005	0.005	0.272	0.272
	(0.009)	(0.009)	(0.268)	(0.268)
Age youngest child	0.008***	0.003	0.499***	0.490***
	(0.003)	(0.004)	(0.084)	(0.117)
Age youngest child x (age y. child >11)		0.011**		0.019
		(0.005)		(0.167)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	89,248	89,248	89,247	89,247

Sample period 1996-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

6 Discussion and conclusion

The EITC for secondary earners and single parents in the Netherlands provides a natural experiment to study the impact on labour supply of mothers. Using the age criterion of the youngest child as cutoff, I am able to employ a RD analysis. The results indicate that both single mothers and mothers in couples do not work significantly more after the introduction of the EITC. The treatment effects are close to zero and insignificant. An extensive robustness analysis confirms that these results are robust. Furthermore, recent research in the Netherlands also finds small labour supply effects of an extension of the single parent tax credit (Bettendorf et al., 2014). These small effects stand out because related studies – considering the WFTC in the UK and the EITC in the US – find substantial effects on the participation margin. Below I will discuss a number of potential explanations for this discrepancy.

First, the noise around the cutoff age of the youngest child leads to an under-

estimated treatment effect. Some parents are assigned to the control group - based on the observed age at the survey date – while in fact they belong to the treatment group. This biases the treatment effect downward. However, the study by Bettendorf et al. (2014) – which observes the exact birth date – finds similar small labour supply effects. Suggesting that the downward bias resulting from this noise around the cutoff is not the main driver of the small effects I find.

Second, the tax credit might have been too small to generate a significant effect. Indeed, for the earlier years of the EITC the amounts were quite limited in magnitude (Table A.16). However, in more recent years the tax credit have increased steadily. For example, in 2009 the tax credit increased the gross income for someone with the minimum wage of €16,574 by 7.4%. This was still more than 5% for those with gross incomes above €30,000. In the studies on the UK and the US the impulses in gross income were comparable in size (see also Bettendorf et al. (2014)). Consequently, it is highly unlikely that the tax credit has been too small to estimate a labour supply response.

Third, in this study I consider mothers with a relatively old youngest child, whereas the others studies also include mothers with younger children. This was also put forward in the paper by Bettendorf et al. (2014) as a potential explanation. Indeed, evidence from the Netherlands indicate that the labour supply elasticity is higher for single mothers with younger children (Mastrogiacomo et al., 2013). Hence, this might be a plausible explanation for the small labour supply effects I find for single parents.

Fourth, one might argue that mothers who are in the treatment group end up in the control group in later years as their child gets older. If, in addition, the EITC has a career effect on labour supply, then both the treatment and control group are affected by the EITC – leading to a downward biased treatment effect. Although, this is a valid concern, I do not find any evidence supporting it. For instance, if I look at separate regressions for years in which there was a major expansion of the EITC (Table A.1 and A.8) – so that the there are no mothers in the control group who experienced the expansion – I do not find higher treatment effects than in the

pooled sample.

Finally, there could be restrictions that prevent mothers from realizing their labour supply preferences. For example demand restrictions or social restrictions. The demand restrictions are also touched upon by Bettendorf et al. (2014). In particular around 2002 the Netherlands experienced a business cycle downturn. However, the treatment effect I find is small and insignificant not only around 2002 but also in later years. Furthermore, the small labour supply effects I find might be due to a particular Dutch attitude toward a mothers' decision to join or stay out of the labour force. However, there is no indication that in the Netherlands society's perception is particularly conservative. On the contrary, labour participation among Dutch mothers is very high reflecting the rather liberal stance of most people on this topic (SCP, 2008). This is different for working hours. Most Dutch men and women agree that women should work less if they have children (SCP, 2008). Moreover, mothers mostly prefer to have a part-time job, thereby limiting the scope for increases in the working hours.

These findings may also be of interest to policy makers. In particular, the finding that, despite the relatively large tax credit in recent years, the labour supply effects of mothers with a relatively old youngest child turn out to be small if not zero. Policy makers could address this by lowering the eligibility age of the youngest child, thereby targeting the groups with a higher labour supply elasticity. The desirability to do so, however, remains a political question, especially because the tax credit can also be seen as income support.

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Table A.1: Biannual regressions for the participation rate of single mothers

	Period: 2002		Period: 2003-2004		Period: 2005-2006		Period: 2007-2008		Period: 2009	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment effect	-0.081	0.007	-0.019	0.006	-0.042	0.014	0.046	0.068**	-0.022	0.008
	(0.076)	(0.085)	(0.035)	(0.039)	(0.034)	(0.037)	(0.031)	(0.033)	(0.043)	(0.046)
Age youngest child	-0.047	-0.129***	0.005	-0.019	0.020	-0.032	0.040***	0.019	0.018	-0.021
	(0.032)	(0.044)	(0.016)	(0.022)	(0.015)	(0.021)	(0.014)	(0.019)	(0.019)	(0.029)
Age youngest child x (age y. child >11)		0.172***		0.048		0.105***		0.045*		0.073*
		(0.065)		(0.031)		(0.029)		(0.027)		(0.038)
Observations	680		3,043		3,425		3,306		1,689	

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.2: Biannual regressions for the hours worked of single mothers

	Period: 2002		Period: 2003-2004		Period: 2005-2006		Period: 2007-2008		Period: 2009	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment effect	-1.555	-0.385	-1.560	-1.381	-1.361	0.142	2.103**	2.798**	-1.554	-0.920
	(2.450)	(2.786)	(1.155)	(1.310)	(1.079)	(1.190)	(1.056)	(1.135)	(1.463)	(1.554)
Age youngest child	-0.460	-1.557	0.411	0.245	0.802*	-0.591	2.041***	1.365**	0.373	-0.473
	(1.081)	(1.390)	(0.509)	(0.676)	(0.468)	(0.656)	(0.466)	(0.660)	(0.673)	(1.011)
Age youngest child x (age y. child >11)		2.302		0.340		2.821***		1.406		1.540
		(2.175)		(1.016)		(0.934)		(0.923)		(1.340)
Observations	680		3,043		3,425		3,306		1,689	

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.3: Placebo RD for both participation rate and hours worked of single mothers

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	0.025	0.026	0.037	1.854	1.889	2.146
	(0.052)	(0.052)	(0.059)	(1.694)	(1.702)	(1.939)
Age youngest child	0.018	0.013	0.007	1.550**	1.436*	1.308
	(0.023)	(0.025)	(0.032)	(0.764)	(0.812)	(1.011)
Age youngest child^2		0.006			0.128	
		(0.012)			(0.383)	
Age youngest child x (age y. child >11)			0.022			0.513
			(0.047)			(1.531)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,612	1,612	1,612	1,612	1,612	1,612

Sample period 1996-2000. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.4: Participation and hours worked of single mothers, excluding 12 year olds

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.093***	-0.093***	-0.063**	-2.092***	-2.090***	-1.187
	(0.024)	(0.023)	(0.027)	(0.784)	(0.784)	(0.934)
Age youngest child	-0.008	-0.018**	-0.023**	0.464*	0.166	0.015
	(0.007)	(0.009)	(0.011)	(0.250)	(0.295)	(0.346)
Age youngest child^2		0.005**			0.150*	
		(0.002)			(0.083)	
Age youngest child x (age y. child >11)			0.030**			0.903*
			(0.015)			(0.498)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,150	12,150	12,150	12,150	12,150	12,150

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.5: Participation rate and hours worked of single mothers, wider bandwidth

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.012	-0.012	0.002	-0.550	-0.544	-0.150
	(0.013)	(0.013)	(0.014)	(0.431)	(0.431)	(0.454)
Age youngest child	0.015***	0.011***	0.000	0.846***	0.736***	0.453***
	(0.004)	(0.004)	(0.006)	(0.129)	(0.133)	(0.176)
Age youngest child^2		0.004***			0.113***	
		(0.001)			(0.041)	
Age youngest child x (age y. child >11)			0.029***			0.792***
			(0.008)			(0.253)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,216	18,216	18,216	18,216	18,216	18,216

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.6: Participation rate for subgroups of single mothers

	(1)	(2)	(3)	(4)	(5)	(6)
	Lower educated	Medium educted	Higher educated	Native	Western immi-grant	Non-western immigrant
Treatment effect	-0.047	0.003	-0.010	0.006	-0.108*	-0.070
	(0.035)	(0.026)	(0.026)	(0.019)	(0.057)	(0.050)
Observations	3,733	5,462	2,948	9,182	1,179	1,782

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.7: Hours worked for subgroups of single mothers

	(1)	(2)	(3)	(4)	(5)	(6)
	Lower educated	Medium educted	Higher educated	Native	Western immi-grant	Non-western immigrant
Treatment effect	-2.295**	-0.097	0.295	0.113	-4.662**	-2.112
	(1.066)	(0.872)	(1.010)	(0.621)	(1.892)	(1.695)
Observations	3,733	5,462	2,948	9,182	1,179	1,782

Sample period 2002-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.8: Biannual regressions for the participation rate of mothers in couples

	Period: 2001-2002		Period: 2003-2004		Period: 2005-2006		Period: 2007-2008		Period: 2009	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment effect	-0.067***	-0.073***	0.017	0.017	-0.004	0.011	-0.010	-0.002	-0.023	-0.013
	(0.022)	(0.024)	(0.013)	(0.014)	(0.012)	(0.013)	(0.012)	(0.014)	(0.017)	(0.018)
Age youngest child	-0.018*	-0.013	0.021***	0.021***	0.007	-0.007	-0.003	-0.011	0.012	0.001
	(0.010)	(0.014)	(0.006)	(0.008)	(0.005)	(0.008)	(0.006)	(0.008)	(0.007)	(0.011)
Age youngest child x (age y. child >11)		-0.011		-0.001		0.028***		0.016		0.021
		(0.020)		(0.012)		(0.011)		(0.011)		(0.015)
Observations	7,408		20,306		21,946		19,137		9,562	

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.9: Biannual regressions for the hours worked of mothers in couples

	Period: 2001-2002		Period: 2003-2004		Period: 2005-2006		Period: 2007-2008		Period: 2009	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment effect	-1.873***	-1.947***	0.814**	0.666	0.081	0.137	-0.624	-0.338	-0.815	-0.859
	(0.674)	(0.754)	(0.385)	(0.424)	(0.374)	(0.407)	(0.398)	(0.442)	(0.567)	(0.617)
Age youngest child	-0.176	-0.113	0.899***	1.034***	0.536***	0.480**	0.094	-0.181	0.517**	0.561
	(0.300)	(0.407)	(0.174)	(0.240)	(0.169)	(0.237)	(0.180)	(0.248)	(0.252)	(0.354)
Age youngest child x (age y. child >11)		-0.135		-0.282		0.112		0.560		-0.088
		(0.598)		(0.345)		(0.336)		(0.357)		(0.496)
Observations	7,408		20,306		21,946		19,137		9,562	

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.10: Placebo RD for participation rate and hours worked of mothers in couples

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	0.004	0.004	0.002	-0.032	-0.031	-0.198
	(0.020)	(0.020)	(0.022)	(0.569)	(0.569)	(0.622)
Age youngest child	0.022**	0.023**	0.025*	0.769***	0.850***	0.934***
	(0.009)	(0.010)	(0.013)	(0.255)	(0.281)	(0.354)
Age youngest child^2		-0.001			-0.083	
		(0.004)			(0.127)	
Age youngest child x (age y. child >11)			-0.005			-0.334
			(0.018)			(0.507)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,889	10,889	10,889	10,888	10,888	10,888

Sample period 1996-2000. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.11: Participation and hours worked, mothers in couples excluding 12 year olds

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.021**	-0.021**	-0.014	-0.117	-0.109	0.042
	(0.009)	(0.009)	(0.011)	(0.284)	(0.284)	(0.344)
Age youngest child	0.002	0.001	-0.001	0.520***	0.472***	0.447***
	(0.003)	(0.003)	(0.004)	(0.091)	(0.106)	(0.124)
Age youngest child^2		0.001			0.025	
		(0.001)			(0.030)	
Age youngest child x (age y. child >11)			0.006			0.151
			(0.006)			(0.180)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	77,217	77,217	77,217	77,217	77,217	77,217

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.12: Participation and hours worked of mothers in couples, wider bandwidth

	Participation rate			Hours worked		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment effect	-0.007	-0.007	-0.004	-0.123	-0.120	-0.084
	(0.005)	(0.005)	(0.005)	(0.151)	(0.151)	(0.159)
Age youngest child	0.006***	0.005***	0.003	0.486***	0.476***	0.452***
	(0.001)	(0.002)	(0.002)	(0.045)	(0.047)	(0.062)
Age youngest child^2		0.001*			0.012	
		(0.000)			(0.015)	
Age youngest child x (age y. child >11)			0.006**			0.072
			(0.003)			(0.089)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	117,342	117,342	117,342	117,342	117,342	117,342

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.13: Participation rate for subgroups of mothers in couples

	(1)	(2)	(3)	(4)	(5)	(6)
	Lower educated	Medium educted	Higher educated	Native	Western immi-grant	Non-western immigrant
Treatment effect	0.019	-0.023*	-0.009	-0.010	0.015	-0.002
	(0.014)	(0.009)	(0.010)	(0.007)	(0.023)	(0.033)
Observations	22,310	36,784	19,265	67,925	6,391	4,043

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

Table A.14: Hours worked for subgroups of mothers in couples

	(1)	(2)	(3)	(4)	(5)	(6)
	Lower educated	Medium educted	Higher educated	Native	Western immi-grant	Non-western immigrant
Treatment effect	0.482	-0.669**	0.010	-0.180	0.831	-1.507
	(0.384)	(0.287)	(0.386)	(0.208)	(0.744)	(1.076)
Observations	22,310	36,784	19,265	67,925	6,391	4,043

Sample period 2001-2009. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Controls are included.

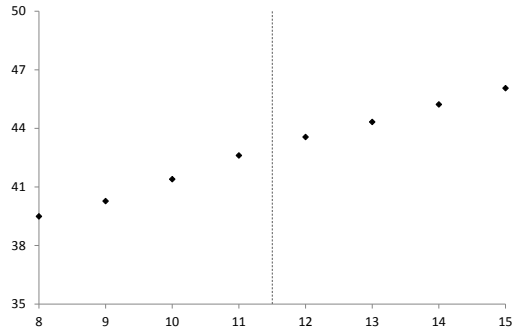
Table A.15: RD analysis for the control variables

	Single mothers	Mothers in couples
Age of the mother	0.086	0.099
	(0.200)	(0.065)
Higher education	0.034*	-0.001
	(0.018)	(0.007)
Medium education	-0.032	0.002
	(0.020)	(0.008)
Lower education	-0.002	-0.001
	(0.019)	(0.007)
Native	-0.012	-0.002
	(0.017)	(0.005)
Western immigrant	-0.003	0.003
	(0.012)	(0.004)
Non-western immigrant	0.015	-0.000
	(0.014)	(0.004)
One minor child	0.021	0.015**
	(0.020)	(0.007)
Two minor children	-0.001	-0.024***
	(0.020)	(0.008)
Three or more minor children	-0.020	0.010
	(0.013)	(0.006)
No adult children	-0.008	0.003
	(0.014)	(0.006)
One or more adult children	0.003	-0.003
	(0.006)	(0.006)

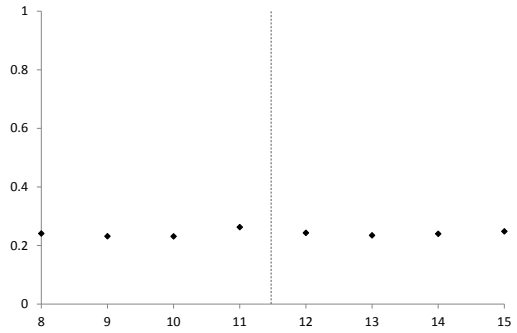
Sample period 2002-2009 for single mothers and 2001-2009 for mothers in couples. Robust standard errors between parenthesis. * p<0.10, **p<0.05 and ***p<0.01. Years fixed effects are included.

Figure A.1: Control variables for single mothers

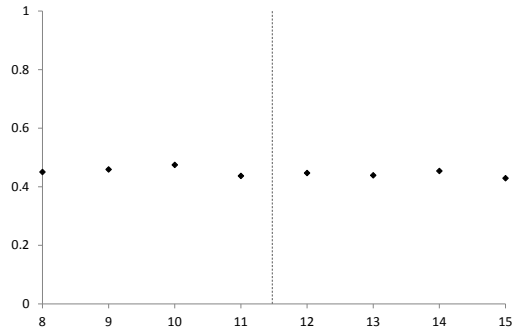
(a) Age of mother



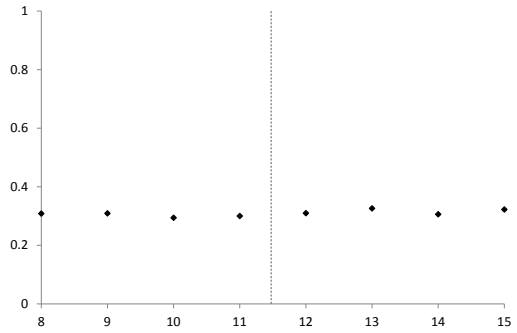
(b) Share of higher educated



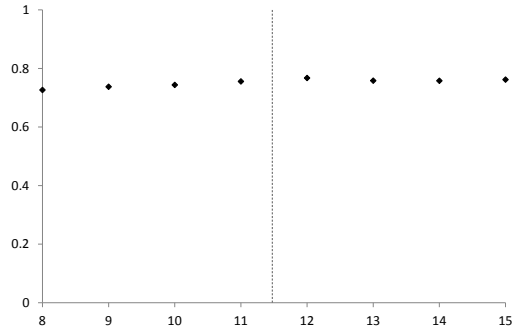
(c) Share of medium educated



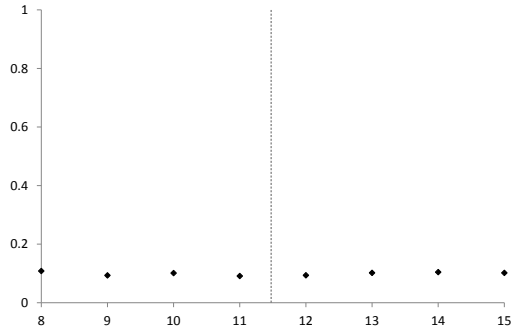
(d) Share of low educated



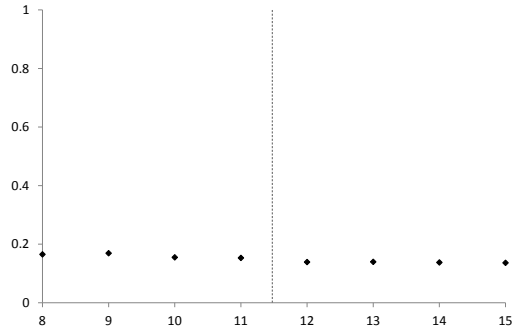
(e) Share of natives



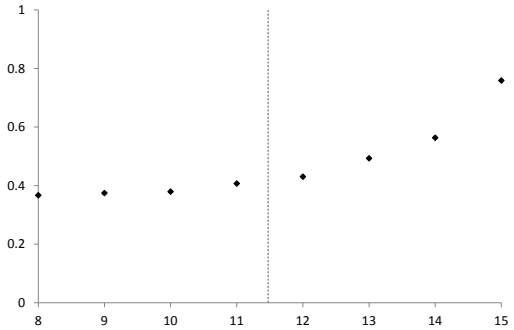
(f) Share of western immigrants



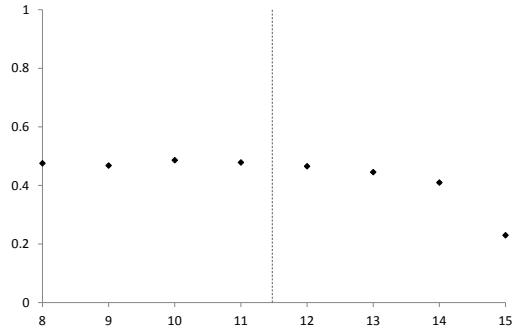
(g) Share of non-western immigrants



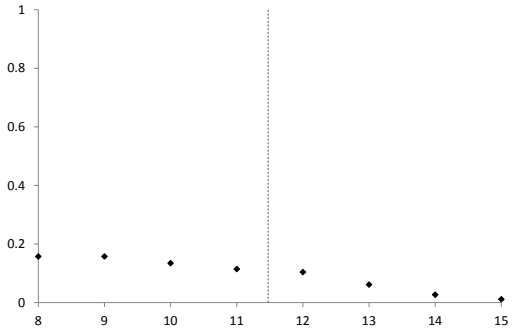
(h) Share of one minor child



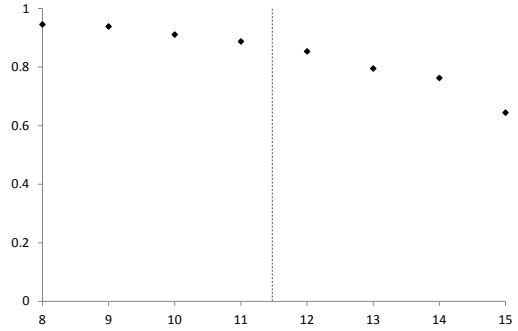
(i) Share of two minor children



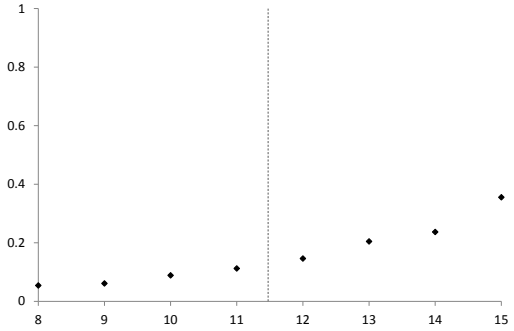
(j) Share of three or more minor children



(k) Share of no adult children



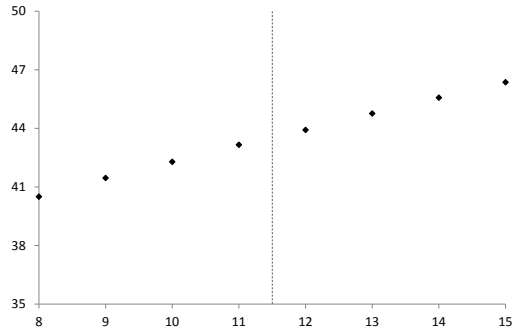
(l) Share of one or more adult children



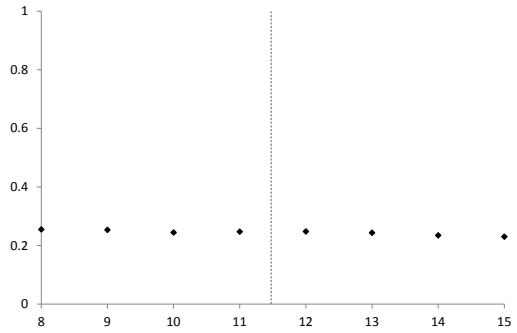
Sample period 2002-2009. Source: Labour Force Survey (Statistics Netherlands)

Figure A.2: Control variables for mothers in couples

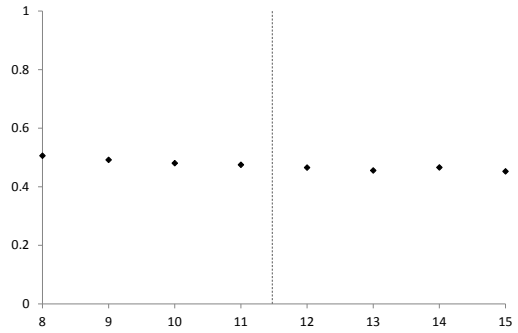
(a) Age of mother



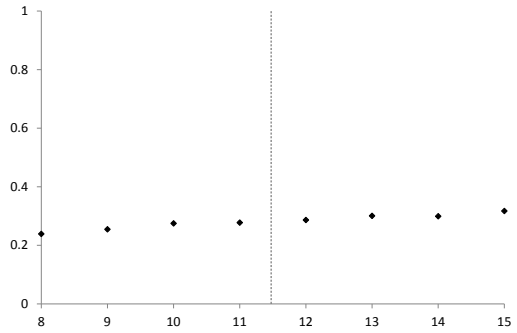
(b) Share of higher educated



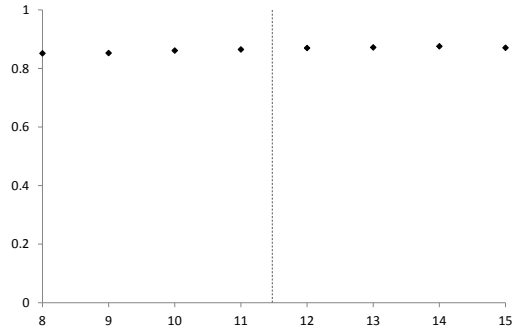
(c) Share of medium educated



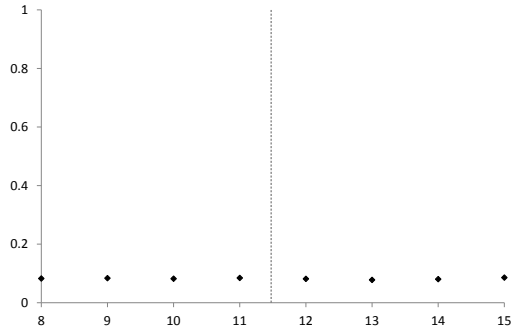
(d) Share of low educated



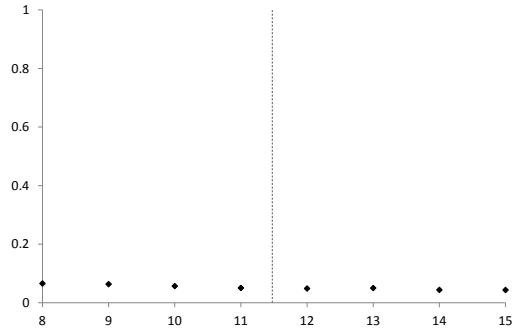
(e) Share of natives



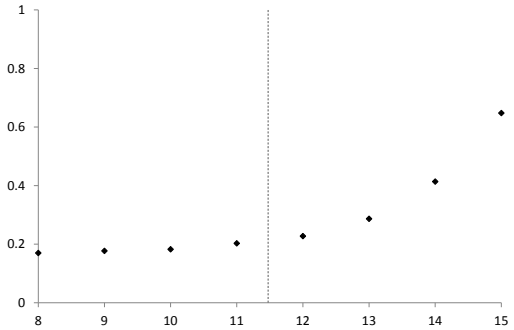
(f) Share of western immigrants



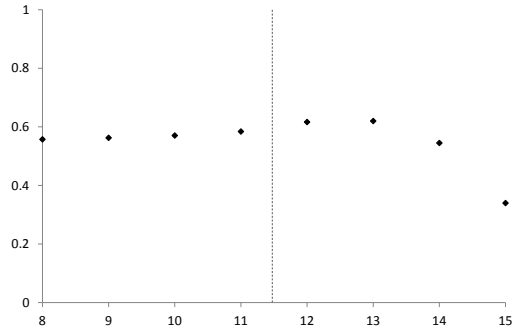
(g) Share of non-western immigrants



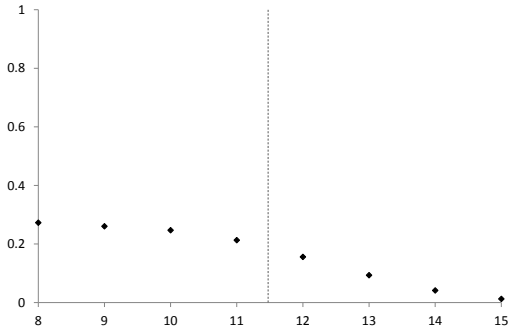
(h) Share of one minor child



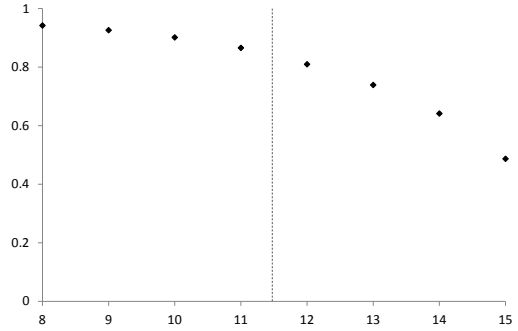
(i) Share of two minor children



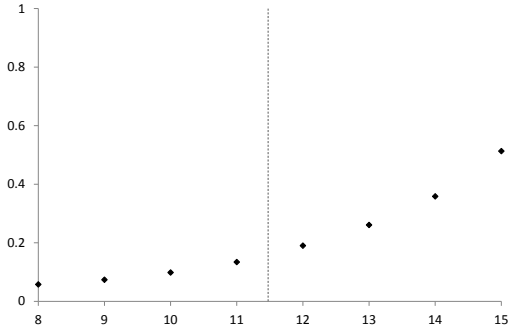
(j) Share of three or more minor children



(k) Share of no adult children



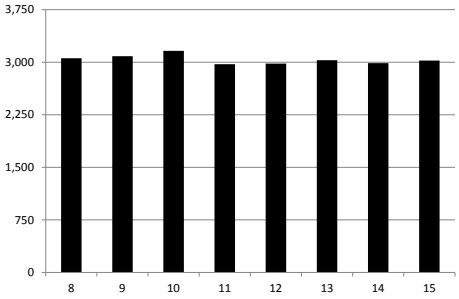
(l) Share of one or more adult children



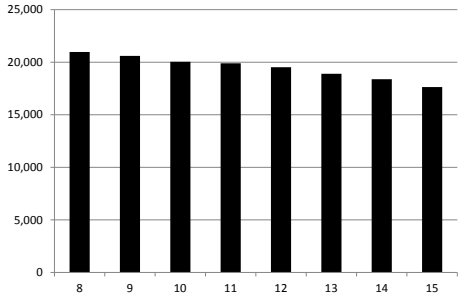
Sample period 2001-2009. Source: Labour Force Survey (Statistics Netherlands)

Figure A.3: Frequency plots

(a) Single mothers



(b) Mothers in couples



Source: Labour Force Survey (Statistics Netherlands)

Table A.16: Overview of the EITC

	"EITC"			
Year	Amount of the Combination credit[A]	Amount of the Additional combination credit[B]	Amount of the Income dependent combination credit[B]	Minimum income threshold to be eligible
2001	€138	Not yet introduced	Not yet introduced	€3,938
2002	€190			€4,060
2003	€214			€4,206
2004	€224	€290		€4,306
2005	€228	€389		€4,366
2006	€146	€608		€4,405
2007	€149	€700		€4,475
2008	€112	€746		€4,542
2009	Replaced by the Income dependent combination credit		€770 + 3,8% (income - 4,619) with a maximum of €1,765.	€4,619

[A] Both primary and secondary earners are eligible for this tax credit; [B] Only secondary earners and single parents are eligible for this tax credit. Source: wetten.overheid.nl

The additional conditions to be entitled to the tax credit include:

1. The taxpayer has a child younger than 12 years on January 1;
2. The child is at least 6 months registered at the taxpayers' home address;
3. Labour income of the taxpayer is above the income threshold.