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# Content

## Abstract

As in other countries, also in Germany there has been large political effort to increase mothers' labor participation through child care provisions. However, it is an open question whether the latest child care reforms of 2013 are successful in this sense. While the introduction of a home care allowance, the so called 'Betreuungsgeld', for families not using public child care for their children aged one and two years was expected to have negative effects, the introduced legal claim for public child care for children of the same age group should increase the use of public child care and therefore speed up the mothers' return to work after child birth. For the analysis we use the German socio-economic panel (GSOEP) and apply a multivariate analysis within the framework of a two-step difference-in-difference approach. Against expectations, results indicate that the reform had no negative effects on labor market participation of migrant mothers in the short run. Effects for the whole sample and for native mothers turn out to be significant positive. The government's motivation for the 'Betreuungsgeld' was to compensate families for not claiming publicly supported child care (Reform part 1) and to support women to reenter the labor market quickly after having given birth (Reform part 2). In the short run the government seems to have reached both aims.

## Zusammenfassung

Wie andere Länder ist auch Deutschland bemüht, die Arbeitsmarktpartizipation von Müttern durch ein erhöhtes Angebot öffentlicher Kinderbetreuung zu steigern. Ob die letzten Kinderbetreuungsreformen von 2013 in dieser Hinsicht erfolgreich sind, ist eine offene Frage. Während von dem eingeführten Betreuungsgeld für Familien, die für ihre Kinder im Alter von 1-2 Jahren keine öffentliche Kinderbetreuung nutzen, negative Effekte zu erwarten sind, sollte der seit 2013 geltende Rechtsanspruch auf öffentliche Betreuung für Kinder des gleichen Alters zu einem Anstieg der Nutzung öffentlicher Kinderbetreuung führen und somit die Rückkehr der Mütter in Beschäftigung beschleunigen. Für die Untersuchung nutzen wir das sozio-ökonomische Panel (SOEP) und führen eine multivariate Analyse im Rahmen eines zweistufigen Difference-in-Difference-Ansatz' durch. Entgegen der Erwartungen finden wir für Mütter, die nach Deutschland migriert sind, in der kurzen Frist keine negativen Effekte der beiden Reformen auf das Arbeitsangebot. Für die gesamte Stichprobe sowie für deutsche Mütter ergeben sich signifikant positive Arbeitsmarktpartizipationseffekte für beide Reformteile zusammen. Ziele der Bundesregierung waren es, Familien dafür zu kompensieren keine öffentliche Kinderbetreuung für ihre jungen Kinder zu nutzen (1. Reformteil) sowie Mütter bei der Rückkehr in den Arbeitsmarkt nach der Geburt des Kindes zu unterstützen (2. Reformteil). In der kurzen Frist scheinen beide Ziele erfüllt worden zu sein.

**JEL-Klassifikation:** J13, J22, H31

**Keywords:** Migration, Germany, mothers' labor supply, child care, family policy

# 1 Introduction

While in industrial countries the majority of adult men are employed and their employment behavior is quite stable across the life course, this does not apply to women. In most countries there exists a large gender gap in labor force participation which is partly caused by family events such as marriage and childbirth (Steiber and Haas 2012). Del Boca (2015) emphasizes that the risk of poverty is closely related to the non-employment rates of mothers. Not purchasing external child care can be assumed to be a main barrier for labor market (re-)integration.

Employment and child care usage rates are especially low among migrant mothers. Compared to native women, a higher percentage of female migrants have children in Germany. However, they still raise their children more often without any public support. Brücker et al. (2014) show that female migrants have a lower probability to work in the first year after arrival as well as in the following ten years. An on average inferior labor market performance of female migrants can among other determinants be explained by the higher probability of women being a tied mover (Shauman and Noonan 2007). A tied mover is a person who moves mainly due to the occupational perspectives of the spouse.

In Germany there has been large political effort to increase labor participation of migrant as well as native mothers through child care provisions. However, one of the latest child care reforms from 2013 was highly criticized for allegedly decreasing mothers work incentives. In August 2013 a new benefit, called 'Betreuungsgeld' has been introduced for families not using public child care for their children aged between one and two years (reform part 1). The aim was to compensate households who care for their young children without public support. The fear of decreasing mothers work incentives should in particular apply to women with inferior labor market perspectives. In addition the reform was criticized to have especially negative effects for children of migrant families because not attending public child care may have negative effects on early education.

Besides the 'Betreuungsgeld', a legal claim of public child care, for children between their 15th month and the end of their 36th month of life was part of the child care reform 2013 (reform part 2). Whereas part 1 of the reform should have negative effects on labor market participation of mothers, particularly for migrant mothers, the opposite should be true for part 2. As the legal claim of public child care might have been achieved with a certain time lag one would assume that the reform should have negative effects on mothers' labor supply and in particular on labor supply of immigrant mothers in the short run. Work incentives should be reduced by the home care allowance and those negative effects could not be offset by the introduction of a legal claim of public child care for children aged 1 to 2 years due to a restricted supply of public child care in the short run. However, positive effects might occur in the long run.

For Germany there are several evaluations on recent reforms with the aiming to increase labor force participation of women or to increase fertility. Schönberg and Ludsteck (2014, 2007) examine the effects of the expansions in maternity leave coverage since 1979. Using data from social security records from 1975-2001 they show that every expansion led to a delay of the mothers return to work. However, it had only little impact on their labor force participation in the long run and hence reforms failed at promoting employment continuity of mothers. Using the SOEP data from 2005-2007 Bergemann and Riphahn (2010) show that the modified German family subsidies from 2007, called "parents' money" ("Elterngeld") succeeded in the short run to speed up mothers' return to work. Müller and Wrohlich (2014) evaluate the two German reforms from 2013 which are also considered in this study. They use the SOEP and the new corresponding data set about families in Germany (Familien in Deutschland, FiD) from 2010 to simulate labor supply effects after 2013. Their results show that both reforms together may lead to a small increase in mothers' labor supply. In contrast, results from Beninger et al. (2010), using the SOEP from 2002 to 2006, show a reduction in labor supply and day care usage due to the home care allowance together with the expansion of publicly funded day care.

In contrast to these two simulation studies, we look at real effects using the German Socio Economic Panel from the years 2007-2014. Two triple difference-in-difference approaches are applied to analyze the reforms effects and to examine how sensitive migrant and native mothers are to changes in economic incentives regarding their labor market participation.

The paper is organized as follows. The next section gives the institutional background on the two reforms. In section three, we discuss theoretical foundations and derive our hypotheses. Section four introduces the data set and provides descriptive statistics on different child care forms in Germany. The identification strategy is described in the fifth section while section six discusses estimation results. Section seven concludes.

## 2 Institutional background: Public child care provisions in Germany

The availability of formal child care for children below the age of three has been very low in West Germany for a long time. In 2002 there were 2 subsidized child care slots available for 100 children in this age group. In contrast, in East Germany child care has been provided for more than a third of all children belonging to this age group (Müller and Wrohlich 2014). Child care provision is mainly financed by the communes (local level). However, in order to increase public child care provision, costs are shared between local und central levels since 2006. In 2014 the expenditures increased to roughly 21.5 billion Euros (Statistisches Bundesamt 2015). Due to the introduction of a legal claim for public child care in 1996 for children aged three or above, Spieß (2011) emphasizes that in 2011 almost all children visit a Kindergarten at least in the year before they start visiting school. The legal claim for a subsidized

child care slot was enlarged in 2013 for all children after their first birthday. This is part 1 of the reform we focus on in this analysis. Müller and Wrohlich (2014) show that in 2013 the availability of subsidized child care amounts to 24 percent for all children under the age of three in Western Germany and to 52 percent in Eastern Germany. However, they emphasize that the supply of child care slots currently appears to satisfy the demand since there is no information or public debate about a noticeable fraction of parents suing their communities for not providing a child care slot.

Part 2 of the 2013 reform that is also relevant for our analysis is the so-called 'Betreuungsgeld' (home care allowance). This public transfer is paid to parents of children aged between 15 and 36 months as long as these children do not visit a public Kindergarten. Until August 2014 it amounted income independently to 100 Euro per month, since August 2014 to 150 Euro. The reform's aim was to compensate households which do not use any form of public or publicly subsidized child care. In July 2015 the Federal Constitutional Court ruled, that the 'Betreuungsgeld' was unconstitutional. Since this decision, 'Betreuungsgeld' can only be claimed in Bavaria and Saxony because these two states established an adequate legal basis. However already approved 'Betreuungsgeld' is paid in all states. Another exception is Thuringia where a comparable, however more generous benefit has been existing since 2006 (Beninger et al. 2010).

# 3 Theoretical foundations and hypotheses

There exist various comprehensive theoretical approaches on labor market mechanism and designs. One aspect in this broad field of the literature is the analysis of incentives for labor market participation. Within this area we focus on labor market participation of mothers, particularly on those with young children, with a native or migrant background. To motivate the empirical analysis we discuss the German child care reforms of 2013 which include encouraging as well as deterring elements for labor market participation of mothers within a simple labor supply framework.

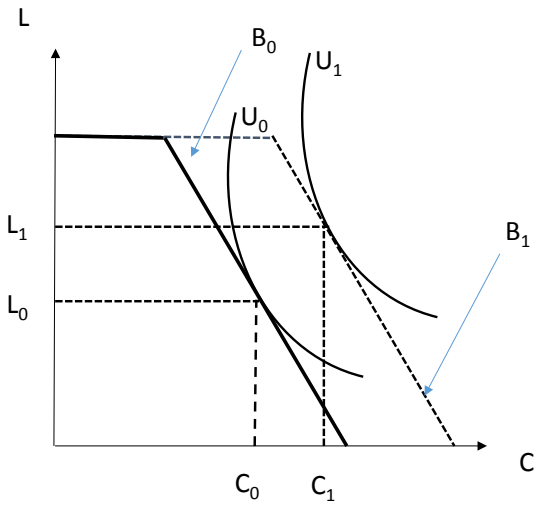
A home care allowance decreases the relative price of own care and may therefore reduce work incentives of mothers. Following Schøne (2004), we illustrate possible substitution and income effects within a standard labor market model. Here the mother adjusts labor supply by choosing a maximal value of consumption (C) and leisure (L) subject to a budget constraint. The home care allowance will positively affect the budget constraint. It is received by mothers who work and use privately paid child care as well as mothers who are not working. We distinguish these two groups.

Effects are presented in figure 1. $B_0$ and the chosen combination of $L_0$ and $C_0$ illustrate the situation before the introduction of the 'Betreuungsgeld' assuming that the non-working mother has a minimum level of not-working related income. After the introduction, the maximal possible level of consumption when leisure equals zero increases since both, mothers who work and use privately paid childminder as well as mothers who are not working are able to claim the benefit and hence have more

money available. The maximal level of possible available leisure will increase as well. Non-working mothers could use the benefit to employ a childminder and those who have already used privately paid child care before the introduction could reduce working time. Hence the introduction of the benefit will lead to a right shift of the budget line from $B_0$ to $B_1$. As illustrated in figure 1, there will be no substitution effect but only an income effect, determined by the height of the benefit.

For non-working mothers, the benefit will have a negative impact on the incentive to participate in market work. For employed mothers, the benefit is assumed to lead to a reduction in working time when leisure is a normal good. Her preferences for leisure and consumption will determine the size of the reduction in working time.

**Figure 1**
**Labor supply before and after the introduction of a home care allowance for mothers using childminder or mothers who are not working**




Source: Schøne (2004)

The illustration above does not yet consider the quality of care. Quality may increase due to the legal claim of public child care for young children. In terms of early education one may argue that the mother then evaluates public child care as superior to own care or care of childminder. She may be willing to pay a “premium” for this type of service. For mothers who do not work, the incentive to work would not be reduced by the home care allowance. For employed mothers the incentive to increase leisure and to reduce working time would decline.

Concerning the effects for immigrant mothers the benefit will influence the decision whether to enter the labor market or not, too. For making entering attractive enough, the reservation wage must be lower than the potential wage whose opportunity costs will be reduced by the home care allowance. As displayed in the following descriptive statistics, it is reasonable to assume that immigrant mothers have lower potential labor market earnings than native mothers and therefore a home care allowance may have on average higher negative effects on labor supply of immigrant mothers. Shau-

man and Noonan (2007) show that despite from structural gender inequality, an inferior labor market performance of immigrant mothers can be explained by the higher probability of women being a tied mover. Following Le (2003), a tied mover is a person who moves for the partner's employment prospects. Mincer (1978) was one of the first who explored the effects of migration on employment and earnings in the presence of family ties. In his view, a tied mover's individual migration gain (or loss) is usually smaller in absolute value than the gain (or loss) of the other partner. This applies more often to wives since compared to the husband, their human capital investments and earnings are usually lower. Among others, Bielby and Bielby (1992) and Taylor (2006) give empirical evidence for the higher likelihood of women being a tied-mover. For immigrant mothers who gave up own working perspectives for the spouse's career opportunities, integration problems should be more significant than for those who moved primarily for their own economic opportunities. Furthermore, it can be assumed that gender-roles in couples which consist of a non-tied and a tied mover are more traditional (Bielby & Bielby 1992). Both issues should result in inferior labor market performance and therefore in particularly low work incentives for immigrant mothers for whom a home care allowance is available.

The reforms of 2013 may have also effects on the labor supply of fathers. However, in this study we focus on mothers. Usually, child care reforms have the aim to increase labor force participation of mothers. Although the 'Betreuungsgeld' may have contradicting effects, we look at effects of both reform parts with the general motivation to examine the impact on the mothers' gender gap in labor force participation. Furthermore, while in the debate about the inferior labor market integration of migrants usually the integration of migrant men is discussed, the integration of female migrants and in particular of those who have children is on average much more problematically. Therefore, we focus on labor market effects of migrant women with children.

Applying the theoretical foundations to the recent German reforms we derive the following hypotheses:

H 1: The 'Betreuungsgeld' (reform part 1) has a negative effect on labor market participation of mothers, particularly of migrant mothers.

H 2: The legal claim of public child care (reform part 2) has a positive effect on labor market participation of mothers, particularly of migrant mothers.

Unfortunately, we cannot test H1 and H2 separately because reform parts 1 and 2 have been introduced at the same point of time for children of the same age. However, we can try to identify different effects of the two reform parts by looking at the development of mothers' labor participation over time.

H 3: As the legal claim might have been achieved with a time lag, the overall reform might have a negative effect on mothers' labor supply, and in particular on labor supply of immigrant mothers **in the short run**.

H 4: **In the long run**, the positive or the negative effect might dominate for natives as well as for migrant mothers.

As the reform only took place in 2013, data availability is still limited. Therefore, we cannot – at this point of time – evaluate its long run effects. Consequently, we concentrate our analysis on H 3.

# 4 Data and descriptive statistics

Our analysis is based on data from the German Socio Economic Panel (SOEP) for the years 2007 to 2014. The SOEP[1] is an ongoing representative panel survey of private households in Germany which started in 1984 in West Germany and was enlarged to the eastern part after unification. It contains detailed information on employment behavior and socio-demographic characteristics. The dataset also includes household oriented information on children and child care. For each child the household is asked whether external care or nannies are used. In some years also child care costs are considered.

From 2007 to 2014 there are 33,363 women living in 25,073 households. About 22 percent of the women have a direct migration background, hence were born outside Germany. With 30 percent, the largest share of migrant women in the SOEP comes from a country of the former USSR. 16 percent come from South East Europe, 14 percent from the West EU and 12 percent from Turkey. Additional 13 percent were born in Eastern Europe; the remaining migrant women come from a country belonging to Asia or Middle East, to Africa, Central-South America or another country.

In the SOEP data, 39 percent of migrant women live in households with children under the age of sixteen. Among the native women only 23 percent live together with children of the respective age. With 1.83 children compared to 1.67 the number of children is higher among migrant households, too.

Table 1 displays main characteristics of our data. Additionally, a t-Test shows whether there is a significant difference between native and migrant mothers. We do find this significant difference for all variables except for child care costs. The net hourly wage is calculated dividing the monthly income by the monthly working hours. Since many women with young children do not work, wages of these women are imputed. Following Devereux (2004), groups are built based on age, education, the two regional German parts, migration status and years. Wages of mothers with no wage information are imputed by the means of the respective groups. All earning values are deflated by the consumer price index of 2005. The personal and household income is top coded at the highest value of the 99 percentile. The household income is equivalence weighted by the number of household members. For the estimation the value is scaled at 1,000. Among mothers of young children who migrated to Germany, on average 38

[1] For more information on the GSOEP see www.diw.de/soep

percent are employed during the observed time period. Among native mothers, about 48 percent are employed. In the data we also observe the share of persons who are available for the labor market and receive ALG II (Arbeitslosengeld II, social benefit). This applies to mothers who are after child birth already looking for an employment or who are employed but whose income is too low to secure the own livelihood. The share of mothers receiving social welfare (ALGII) is of course low for both groups; however it is 2.1 percentage points higher for migrants. As expected the net household income is lower for migrant mothers. Furthermore on average, they have a lower number of years of education and work experience. While only 8 percent of migrant mothers are single, 25 percent of native mothers are single.

Table 1shows that the percentage share of women with young children using external child care varies by about 10 percentage points between the two groups and that the difference is statistically significant. Concerning the use of child care centers the shares are 46 and 55 percent, i.e. they differ by 9 percentage points. Costs of child care are not gathered on an annual basis. Missing data on costs are simulated parametrically controlling for the household income, wage, number of children, whether the woman receives social welfare or lives in eastern Germany and marital status. Furthermore, it is controlled for time and regions (German Bundesländer). While migrant mothers on average spent about 133 Euro per month on external child care, the average amount for native mothers is about 20 Euros higher.

**Table 1**
**Socio-economic characteristics of women with children younger than 4 years old**

| Variable | (a) Mothers born outside Germany | | (b) Native mothers | |
|---|---|---|---|---|
| | mean/ share | s.d. | mean/ share | s.d. |
| Employed*** | 0.384 | 0.486 | 0.476 | 0.499 |
| Netwage per hour*** | 10.726 | 12.910 | 14.250 | 33.654 |
| ALGII*** | 0.137 | 0.344 | 0.116 | 0.320 |
| HH-Netincome per person*** | 1397.444 | 832.401 | 1576.786 | 810.985 |
| Age** | 33.928 | 8.528 | 32.613 | 6.088 |
| Single*** | 0.077 | 0.266 | 0.248 | 0.432 |
| Years of education*** | 11.457 | 2.474 | 13.034 | 2.862 |
| Work experience (fullt.) in years*** | 5.418 | 6.408 | 6.505 | 5.800 |
| East*** | 0.079 | 0.270 | 0.240 | 0.427 |
| Health*** | 3.744 | 0.902 | 3.755 | 0.851 |
| Number of children in HH*** | 2.035 | 1.209 | 1.784 | 0.942 |
| External child care use (any child)*** | 0.493 | 0.500 | 0.594 | 0.491 |
| Use of child care center (any child)*** | 0.461 | 0.499 | 0.552 | 0.497 |
| Costs of child care (for all children) | 133.258 | 164.465 | 152.812 | 178.279 |

Significantly different at *** p<0.01 **p<0.05 *p<0.1.
Source: SOEP, 2007-2014 weighted data

The following tables display shares of chosen child care types by migration status. As displayed in Table 2, for both groups the percentage of households which cared for

their children younger than four without any external help decreased in the last ten years, compared to the ten years before 2005. The percentage of women who used child care centers highly increased for migrants as well as for natives. In the time from 2007 to 2014, about 44 percent of native women and about 61 percent of migrant women with children younger than four care for their children without any other support. In this period 19 percent of migrant mothers versus 21 percent of native mothers use for at least one child external child care centers. German mothers use a combination of any of the named alternatives more intensively.

**Table 2**
**Used child care forms for children<4**

| | 1995-2006 | | 2007-2014 | |
|---|---|---|---|---|
| | Migrants | Natives | Migrants | Natives |
| only Parents | 77.92 | 62.01 | 58.74 | 41.20 |
| relatives/friends | 14.36 | 18.63 | 9.25 | 14.55 |
| child care centers | 4.59 | 9.73 | 21.85 | 23.63 |
| private care, paid | 1.17 | 3.05 | 3.02 | 4.92 |
| other combinations | 1.95 | 6.58 | 7.14 | 15.70 |

Source: SOEP, 2007-2014 weighted data

For the time after 2006, table 3 provides the shares of different child care alternatives for women with a household net income below or above 2000 EUR. While 43 percent of migrant and 66 percent of native women with a net household income above 2000 EUR care for their children without any external help, these shares rise to 70 and 57 percent when income is below 2000 EUR. Especially for natives the share of external private child care highly varies with income. While only about 2 percent of native mothers with a net household income below 2000 EUR use external private child care, 11 percent use it when their income is above 2000 EUR.

**Table 3**
**Used child care forms for children<4, after 2006 by HH Net-Income**

| | Income<2000 | | Income>2000 | |
|---|---|---|---|---|
| | Migrants | Natives | Migrants | Natives |
| only Parents | 59.58 | 42.59 | 50.54 | 33.38 |
| relatives/friends | 9.01 | 14.60 | 11.62 | 14.30 |
| child care centers | 21.74 | 23.55 | 22.97 | 24.07 |
| private care, paid | 2.72 | 4.42 | 5.95 | 7.72 |
| other combinations | 6.96 | 14.84 | 8.92 | 20.52 |

Source: SOEP, 2007-2014 weighted data

# 5 Identification strategy

By applying a difference-in-difference approach, the effect of the two parts of the child care reform, introduced in August 2013, on mothers' labor supply are examined. As explained above, since 2013 a legal claim to formal child care exists for all children aged one year or older (reform part 1). This can be assumed to have a positive effect on mothers' labor supply in the long run however, especially in the first years there may be restrictions due to the availability of child care slots. Furthermore, in 2013 a new benefit, called 'Betreuungsgeld' has been introduced for families who do not use

public or publicly subsidized child care (reform part 2). In economic terms this second reform part increased the relative price of publicly subsidized day care and decreased the relative price of own care. This might reduce exogenous child care use and may have a negative effect on mothers' labor supply.

To examine effects of the two reform parts, several difference-in-difference approaches are applied. The basic idea of the difference-in-difference approach is to compare behavioral changes in the reform period between two groups with similar characteristics where only one group is affected by the policy change (Dustmann and Schönberg 2012). However, in the observed time, the reform is equally and nationwide accessible for all mothers with children of the relevant age. Following Schøne (2004) we apply a two-stage-difference-in-difference approach, expanded by a multivariate third stage. Here mothers' labor supply changes are analyzed by looking at participation rates. To identify causal effects, differences in participation rates are compared between mothers with young and those with old children and between a reform period and a non-reform period. Since the reform was introduced in August 2013, the first effects should be observed in 2014 for children born after July 2012 (only those are eligible).

In a first step it is examined how participation rates of mothers with young children changed from 2011 to 2014. Mothers with children who were born in 2012 after the months of July are two years old in 2014. To increase the number of observations especially of migrants, also mothers with children born in 2013 whose children were older than 14 month at the time of their interview in 2014 are considered for this group. For mothers with children of the same age, it is examined how participation rates changed from 2007 to 2010. Their children were born in 2008 and were two years old in 2010 or they were born in 2009 and at the time of the interview in 2010 older than 14 month. This would be a general difference-in-difference approach. However, in this comparison there are three years between two similar groups. If some contemporaneous macroeconomic shock occurred only in one but not in the other period, the difference-in-difference-estimates will yield biased results for the effects of the child care reform on mothers' labor supply. Therefore, the difference-in-difference-estimate resulting from the comparison of mothers with young children (in the following called treatment group for both periods) is compared to a difference-in-difference-estimate resulting from a comparison between the same two periods (2011-2014 and 2007-2010), but mothers with older children that are not affected by the reform (in the following called the control group for both periods). Mothers of this control group have children who are born in 2006 or 2007 for the reform period and in 2002 or 2003 for the non-reform period. While these mothers with children aged four or five years at the beginning of each period will not be affected by the child care reforms of 2013, a possible macroeconomic shock should influence their labor supply in a similar way than those with younger children.

Following Schøne (2004), the DDD approach may be illustrated as follows:

$$DDD = \{(Y_{-2,-1}^{2011} - Y_{1,2}^{2014}) - (Y_{-2,-1}^{2007} - Y_{1,2}^{2010}) \} - \{(Y_{4,5}^{2011} - Y_{7,8}^{2014}) - (Y_{4,5}^{2007} - Y_{7,8}^{2010}) \} \quad (1)$$

The first difference in the first curved clip represents the change in labor supply of the treatment and the second difference represents the change in labor supply of the control group concerning the time of the reform. In the first curved clip, mothers with children not yet born/ one or two years of age are considered. In the second curved clip, mothers with only children of four and five/ seven and eight years of age are considered.

After considering that a macroeconomic shock might occur in only one period and not the other, the treatment and control group may still differ systematically with respect to important labor supply determinants such as age, education, family status, wages or regions. Observed differences in outcomes may therefore reflect differences between the treatment and control group rather than a treatment effect. Comparable to Schøne (2004) we apply in the framework of the two-step-difference-in-difference approach a multivariate discrete choice regression analysis to control for observed characteristics as well as for regions. For the estimation the data is reduced to the years 2007, 2010, 2011 and 2014 and to the above defined treatment and control group, hence to mothers with children born in 2012 after the months of July, to mothers with children born in 2009/ 2013 when the interview in 2010/ 2014 took place when the child was already 15 month or older or with children who were born in 2002, 2003, 2007 and 2008. Therefore, each considered variable is observed for the reform period or the non-reform period in the first or the second considered year of the respective period. Furthermore, the information belongs to a mother of the treatment or of the control group. In addition to observable characteristics, dummy variables and interaction terms of those dummies are integrated in the equation to be estimated, indicating the group of mothers and the point of time. The estimation equation can be displayed as follows:

$$Y_{ijkt} = \alpha_1 + \alpha_2 Z_{ijkt} + \alpha_3 R13_{ijk} + \alpha_4 POST_{ikt} + \alpha_5 TREAT_{ik} + \alpha_6 (R13_{ijk} * POST_{ikt}) + \alpha_7 (R13_{ijk} * TREAT_{ik}) + \alpha_8 (POST_{ikt} * TREAT_{ik}) + \alpha_9 (R13_{ijk} * TREAT_{ik} * POST_{ikt}) \quad (2)$$

where i indexes mothers, t indexes time (1 for the second, and 0 for the first point of time in the (non-reform period), k indexes the group of mothers (1 if it is a mother of young children, and 0 if it is a mother of older children), and j indexes whether the reform period (2011-2014) is considered (1 for the years 2011 and 2014, 0 for the years 2007 and 2010). Z is a vector with the considered observable characteristics affecting labor supply. The vector contains the age of the woman, whether she receives social benefit (ALGII), whether she is single and whether she lives in the east, her health status, the number of children in the household, her work experiences in years as well as regional dummies on the level of German Bundesländer. R13 represents a dummy variable with value 1 for the years 2011 and 2014 (the reform-period; recall that the reform took place in 2013, therefore R13), and 0 for the non-reform years 2007 and 2010. R13 therefore controls for effects of the reform period. POST is a dummy variable with value 1 if the year is 2014 (for the R13-group) or 2010 (for the non-R13 group), and 0 if the year is 2011 (for the R13-group) or 2007 (for the non-

R13-group). Thus, $\alpha_4$ measures changes in labor supply between the beginning and end of both periods. TREAT is a dummy variable with value 1 if the mother belongs to the above described treatment group i.e. has a young child, TREAT equals 0 if the mother belongs to the control group i.e. has an older child. This dummy controls for effects on participation rates of mothers of younger and older children. The coefficient of the interaction term between R13 and POST, $\alpha_6$ measures changes in labor supply between the first and second observed point of time in the reform period while the interaction term between R13 and TREAT controls for characteristics of the treatment group in the reform period and $\alpha_8$ represents changes between the respective two points of time of the observed period in the treatment group. Finally, the interaction term of R13, TREAT and POST represents the difference-in-difference-in-difference estimate, measuring all variation in labor supply for the 2013 reform-period relative to the non-R13-period for mothers with young children, relative to mothers with older children, between the before and after period. Not including first-order interactions along with this second order interaction term will most likely lead to biased estimates since the effect is confounded with the effects of the omitted first-order interactions.

# 6 Results

**Two steps Difference-in-Difference estimates within the general approach**

Table 4 and 5 present average participation rates and resulting two-step-difference-in-difference (-in-difference) (DD, DDD, equation 1) estimates of the effects of the two child care reforms of 2013 on labor supply. Labor supply is measured as average participation rates for the respective periods and groups. In addition to participation rates, standard errors (in parentheses) and the number of observations are reported. We only consider the mothers who are observed in both, the pre and the post wave of the respective period. Table 4 gives the DDD estimate for the whole sample. Since for mothers in the treatment group the child was born between the pre and the post observed year, the participation rates decrease for both periods almost by the same amount, leading to a small negative difference-in-difference estimate. For the control group the participation rate increases in both periods, leading to a negative difference-in-difference estimate. Comparing these two estimates between the two groups yields a positive difference-in-difference-in-difference estimate, driven by the high increase of labor force participation for the control group in the reform period compared to the non-reform period as well as by the low differences between the periods in the treatment group. This indicates a positive effect of the 2013-reforms on mothers' labor supply for the whole sample. However, as emphasized in the multivariate analysis, the difference may also reflect systematic differences between the treatment and the control group which is likely due to the high age difference of the children.

**Table 4**
**DDD estimates**

| Treatment group: young children, eligible to the reform | | | | | |
|---|---|---|---|---|---|
| Birth year | Period | Pre | Post | Change | DD |
| 2012,13 | 2011-2014 | 0,58 | 0,41 | -0.17*** | |
| | | (0.49) | (0.49) | | |
| | | 194 | 194 | | |
| 2008,09 | 2007-2010 | 0,64 | 0,48 | -0.16*** | -0,01 |
| | | (0.48) | (0.50) | | |
| | | 176 | 176 | | |
| Control group: older children | | | | | |
| Birth year | Period | Pre | Post | Change | DD |
| 2006,07 | 2011-2014 | 0,60 | 0,71 | 0.10*** | |
| | | (0.49) | (0.46) | | |
| | | 775 | 775 | | |
| 2002,03 | 2007-2010 | 0,67 | 0,68 | 0.01 | -0,09 |
| | | (0.47) | (0.47) | | |
| | | 278 | 278 | **DDD** | **0,08** |

Source: SOEP, 2007-2014

Table 5 gives participation rates and DD and DDD estimates separately for migrants and natives. For natives the analysis does not differ much to the one of the whole sample, indicating a positive reform effect. For migrants the effect is positive, too though in the treatment group the decrease in the participation rate is much higher for the non-reform period. Unfortunately the number of observation in the treatment group is quite low.

**Table 5**
**DDD estimates by migration status**

**Natives**

Treatment group: young children, eligible to the reform

| Birth year | Period | Pre | Post | Change | DD |
|---|---|---|---|---|---|
| 2012,13 | 2011-2014 | 0,60 | 0,44 | -0.17*** | |
| | | (0.49) | (0.50) | | |
| | | 167 | 167 | | |
| 2008,09 | 2007-2010 | 0,63 | 0,51 | -0.13** | -0,04 |
| | | (0.48) | (0.50) | | |
| | | 156 | 156 | | |
| Control group: older children | | | | | |
| Birth year | Period | Pre | Post | Change | DD |
| 2006,07 | 2011-2014 | 0,63 | 0,74 | 0.11*** | |
| | | (0.48) | (0.44) | | |
| | | 646 | 646 | | |
| 2002,03 | 2007-2010 | 0,71 | 0,71 | 0 | -0,11 |
| | | (0.45) | (0.45) | | |
| | | 242 | 242 | **DDD** | **0,07** |

**Migrants**

Treatment group: young children, eligible to the reform

| Birth year | Period | Pre | Post | Change | DD |
|---|---|---|---|---|---|
| 2012,13 | 2011-2014 | 0,44 | 0,26 | -0.19 | |
| | | (0.50) | (0.45) | | |
| | | 27 | 27 | | |
| 2008,09 | 2007-2010 | 0,65 | 0,25 | -0.4** | 0,21 |
| | | (0.49) | (0.44) | | |
| | | 20 | 20 | | |
| Control group: older children | | | | | |
| Birth year | Period | Pre | Post | Change | DD |
| 2006,07 | 2011-2014 | 0,47 | 0,55 | 0.08 | |
| | | (0.50) | (0.50) | | |
| | | 129 | 129 | | |
| 2002,03 | 2007-2010 | 0,39 | 0,50 | 0.11 | 0,03 |
| | | (0.49) | (0.51) | | |
| | | 36 | 36 | **DDD** | **0,18** |

Source: SOEP, 2007-2014

**Probit estimation within the Two-step-Difference-in-Difference approach**

While the above presented approach makes it possible to consider asymmetric macroeconomic shocks, the treatment and control group may still differ systematically with respect to important labor supply determinants such as age, education, family status, wages or regions. Observed differences in outcomes may therefore reflect differences between the treatment and control group rather than a treatment effect. Therefore, we apply a probit regression analysis in the framework of the before presented two-step-difference-in-difference-approach. The data is reduced to the before described treatment and control group and the respective observation periods.

Results of calculated marginal effects at the variables' means are reported in table 6. We estimate models for the overall sample as well as separate models for migrant

and native mothers. The models include the explanatory variables presented in table 1. Instead of yearly dummy variables, dummy variables and first and second order interactions of the difference-in-difference-in-difference approach introduced in section five are included. As described in section five the interaction term of R13, TREAT and POST represents the difference-in-difference-in-difference estimate, measuring all variation in labor supply for the 2013 reform-period relative to the non-R13-period for mothers with young children, relative to mothers with older children, between the before and after period.

The coefficient about the reform is significantly positive for the whole sample as well as for natives. For migrants the coefficient is positive too but not statistically significant. Hence for migrants the reform appears to have no significant effect on labor supply in the first year after introduction. Since the observed periods are quite long and the group of mothers in the two treatment groups should not overlap, there is a large age difference of the children between mothers in the control and the treatment group. The mothers of the treatment group give birth within the observed period, and the children of the mothers in the control group are four or five in the beginning and seven or eight in the end of the periods. Therefore systematic differences in their employment behavior can be expected leading to varying estimates between the general difference-in-difference approach and the multivariate analysis. However, in both approaches the results indicate a positive effect of the two reforms from 2013 on labor force participation of mothers, therefore results of the general approach are confirmed.

Looking at the impact of the control variables we find that the probability to work is higher for older mothers, single mothers, mothers in good health conditions as well as mothers with a high education and high work experiences. In contrast the migration background, the number of children, the net wage per hour as well as the circumstance of receiving social welfare (ALGII) reduces the probability of being employed when having children.

**Table 6**
**Marginal effects of probit estimation of labor force participation**

| | Total | Migrants | Natives |
|---|---|---|---|
| Age | 0.080*** | 0.088*** | 0.079*** |
| | (0.006) | (0.017) | (0.006) |
| Age² | -0.001*** | -0.001*** | -0.001*** |
| | (0.000) | (0.000) | (0.000) |
| ALGII | -0.235*** | -0.269*** | -0.227*** |
| | (0.022) | (0.064) | (0.023) |
| Single | 0.077*** | 0.175** | 0.072*** |
| | (0.018) | (0.078) | (0.019) |
| Health | 0.032*** | 0.063*** | 0.026*** |
| | (0.008) | (0.020) | (0.008) |
| # of children | -0.077*** | -0.134*** | -0.066*** |
| | (0.007) | (0.019) | (0.008) |
| East | 0.020 | 0.312 | 0.020 |
| | (0.038) | (0.274) | (0.038) |
| ln(wage) imp. | -0.111*** | -0.055 | -0.122*** |
| | (0.020) | (0.046) | (0.023) |
| Work experience | 0.006*** | 0.005 | 0.006*** |
| | (0.001) | (0.004) | (0.002) |
| Migration status | -0.104*** | | |
| | (0.018) | | |
| Education | 0.022*** | 0.011 | 0.023*** |
| | (0.003) | (0.008) | (0.003) |
| R13 | 0.130*** | 0.203*** | 0.114*** |
| | (0.024) | (0.066) | (0.026) |
| POST | 0.093*** | 0.189*** | 0.076*** |
| | (0.025) | (0.068) | (0.027) |
| TREAT | -0.032 | -0.023 | -0.037 |
| | (0.041) | (0.140) | (0.042) |
| R13_POST | -0.033 | -0.157* | -0.009 |
| | (0.033) | (0.089) | (0.035) |
| R13_TREAT | -0.079 | -0.146 | -0.068 |
| | (0.052) | (0.160) | (0.054) |
| POST_TREAT | -0.095* | -0.212 | -0.077 |
| | (0.053) | (0.169) | (0.055) |
| R13_TREAT_POST | 0.150** | 0.288 | 0.129* |
| | (0.064) | (0.194) | (0.068) |
| # of observation | 4599 | 676 | 3916 |

* p<0.1, ** p<0.05, *** p<0.01

All equations include regional dummy variables, robust standard errors are computed.

Source: SOEP, 2007-2014

# 7 Conclusion

In Germany there has been ongoing political effort to increase mothers' labor supply. The latest reform in this field took place in 2013 and consists of two parts: First, a legal claim to public child care for all children aged one year or older that is expected to increase labor supply of young children's mothers. However, the second part of this child care reform might demotivate mothers to reduce family-related employment interruption because the 'Betreuungsgeld' is only payed to families who do not use public or publicly subsidized child care for their young children. It was assumed that es-

pecially parents with inferior labor market perspectives are discouraged to use external day care which can be important for early education, particularly if they belong to migrant families that speak a foreign language at home.

This study evaluates the 2013 child care reform by looking at labor market participation rates in 2014. We apply a two-step-difference-in-difference-approach where changes of labor force participation rates between a reform period and a non-reform period as well as between mothers with young and old children are compared. In the basic version positive effects on mothers' labor supply occur for the whole sample as well as for natives and migrants separately. Differences between the treatment and control group which might be mainly based on the age of the children may yield biased results. Controlling for these potential differences in a multivariate analysis, the effects remain positive for the whole sample, the same applies for natives and migrants separately although for migrants the effect is not significant. It becomes apparent that the newly introduced 'Betreuungsgeld' in combination with the legal claim for public child care provisions has not - as expected - significantly reduced the labor supply. In the short run, the reform should have fulfilled the aim of the German government namely to increase labor market participation of mothers and to compensate households who do not use public child care. Since migrant mothers are often tied movers and have inferior labor market perspectives, it has been assumed that for this group the home care allowance has high negative effects. However also after controlling for observable characteristics and main labor market determinants, there results no significant negative effects on migrant mothers' labor supply. The results rather indicate that in the short run the reforms from 2013 had no significant effect on migrant mother's labor supply.

While the reform's first part has influenced the availability of child care, the second part has influenced its costs. As Del Boca (2015) emphasizes, policy makers and scholars with an interest in increasing women's labor supply through child care provisions have mainly focused on these two determinants. For countries were child care services are provided in the private sector such as the U.S., Canada or the U.K., studies have shown that costs of child care have a significant effect on its use and on labor supply of women with children (see Blau & Robins 1988, Connelly 1992, Powell 2002). However, Del Boca (2015) shows that in Europe child care availability appears to be more important than costs. Our results confirm this hypothesis. Hence, in order to support mothers and in particular immigrant mothers' labor supply ensuring the availability of affordable child care also for children younger than three years is of upmost importance.

## Reference


Beninger D, Bonin H, Horstschräer J, Mühler G. 2010. Wirkungen eines Betreuungsgeldes bei bedarfsgerechtem Ausbau frühkindlicher Kindertagesbetreuung: eine Mikrosimulationsstudie. In: Vierteljahrshefte zur Wirtschaftsforschung 79: 147-68

Bergemann A, Riphahn RT. 2010. Female labour supply and parental leave benefits–the causal effect of paying higher transfers for a shorter period of time. In: Applied Economics Letters 18: 17-20

Bielby W, T., Bielby D, D. 1992. I will follow him: Family ties, Gender-Role beliefs, and reluctance to relocate for a better job. In: American Journal of Sociology 97: 1241-67

Blau DM, Robins PK. 1988. Child-care costs and family labor supply. In: The Review of Economics and Statistics: 374-81

Brücker H, Liebau E, Romiti A, Vallizadeh E 2014. Anerkannte Abschlüsse und Deutschkenntnisse lohnen sich. Arbeitsmarktintegration von Migranten in Deutschland. In: IAB-Kurzbericht 21.3/2014: 21-28

Connelly R. 1992. The effect of child care costs on married women's labor force participation. In: The review of Economics and Statistics: 83-90

Del Boca D. 2015. The impact of child care costs and availability on mothers' labor supply. In: ImPRovE Working Paper 15/04: 1-19

Devereux PJ. 2004. Changes in relative wages and family labor supply. In: Journal of Human Resources 39: 698-722

Dustmann C, Schönberg U. 2012. Expansions in maternity leave coverage and children's long-term outcomes. In: American Economic Journal: Applied Economics 4: 190-224

Le AT. 2003. Female Labour Market Participation: Differences Between Primary and Tied Movers. In: Discussion Paper 03.17: 1-35

Mincer J. 1978. Family Migration Decision. In: Journal of Political Economy 86: 749-73

Müller K-U, Wrohlich K. 2014. Two steps forward-one step back? Evaluating contradicting child care policies in Germany. In: Verein für Socialpolitik Hamburg: 1-41

Powell LM. 2002. Joint labor supply and childcare choice decisions of married mothers. In: Journal of Human Resources: 106-28

Schönberg U, Ludsteck J. 2007. Maternity leave legislation, female labor supply, and the family wage gap. In: IZA Discussion Paper 2699: 1-63

Schönberg U, Ludsteck J. 2014. Expansions in maternity leave coverage and mothers' labor market outcomes after childbirth. In: Journal of Labor Economics 32: 469-505

Schøne P. 2004. Labour supply effects of a cash-for-care subsidy. In: Journal of Population Economics 17: 703-27

Shauman K, A., Noonan M, C. 2007. Family migration and labor force outcomes: sex differences in occupational context. In: Social Forces 85: 1735-64

Spieß CK. 2011. Vereinbarkeit von Familie und Beruf–wie wirksam sind deutsche „Care Policies "? In: Perspektiven der Wirtschaftspolitik 12: 4-27

Statistisches Bundesamt, 2015, Statistiken der Kinder- und Jugendhilfe - Ausgaben und Einnahmen 2014,Wiesbaden.

Steiber N, Haas B. 2012. State of the Art. Advances in explaining women's employment patterns. In: Socio-Economic Review 10: 343-67

Taylor M. 2006. Tied migration and subsequent employment: evidence from couples in Britain. In: ISER Working Paper 2006-05: 1-34

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