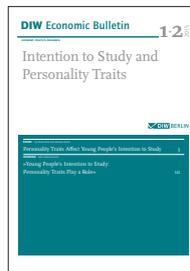


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REPORT by Sophia Schmitz, C. Katharina Spieß and Juliane F. Stahl

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Day care centers: family expenditures increased significantly at some points between 1996 and 2015

By Sophia Schmitz, C. Katharina Spieß and Juliane F. Stahl

Private household expenditures on child care in centers have significantly risen: from an average of 98 euros per month in 2005 to just under 171 euros in 2015 for a child under three and for children three and older ("Kindergarten"¹ age group), from 71 to 97 euros in the period between 1996 and 2015. At the same time, more and more households are completely exempt from paying fees for day care. However, relative to their income, households on or below the poverty line that have day care expenditures still pay virtually the same amount as other households. For the first time, based on data from the Socio-Economic Panel (SOEP) and the special study Families in Germany (FiD), the present report shows trends in day care expenditures in recent years and who is carrying how much of a burden as a result. Lower income households and single parents in the Kindergarten age group have been affected to a lesser extent or not at all by increases in day care expenditures over the years. Nevertheless, in the future progressive fee scales should be implemented more thoroughly and, above all, uniformly throughout the federal states. It is not necessary to make day care universally free of charge because households in upper income groups have expressed a high willingness to pay. This potential has not been fully utilized and could be enhanced—especially if public money is used to improve day care quality.

More and more children are going to day care centers. Whereas in 1994 the number was six percent of all children under three and 78 percent of children three and older until starting school, the attendance rates in 2016 were just under 28 percent and 93 percent, respectively.² The significance of day care centers as early childhood education and care opportunities outside the family has risen sharply in recent years. In the public forum, a lively discussion is underway about whether the expansion of spots is adequate, how the quality could be improved, who should bear the costs, and if parents should have to pay for the service at all. These issues were also highlighted in the recent Bundestag election.

As a result of the day care expansion, public expenditures on day care centers have risen significantly. States and municipalities, which are responsible for financing day care centers, spent a total of 23 billion euros on them in 2015. At just under 11 billion euros, they spent less than half of that sum in 2005.³ For the past several years, the federal government has also contributed to financing day care, but to a much lesser extent. At the same time, legal provisions regarding parents' fees were changed to exempt specific groups partially or completely from payment, depending on the federal state.

Until now, there has been little information on how these changes have affected the average parental fee. Has the proportion of children in households where parents pay fees for day care increased or decreased? Which house-

¹ The German "Kindergarten" is very different to the US kindergarten. In Germany day care centers for children three years and over are often called "Kindergarten".

² See German Federal Statistical Office, "Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege 2016," (German Federal Statistical Office, Wiesbaden, 2016) (available online, accessed September 27, 2017). This also applies to all other online sources in this study, if not stated otherwise) and German Federal Statistical Office, "Tageseinrichtungen für Kinder," *Sozialleistungen* series 13, vol. 6.3.1 (1994). In 1994, they calculated provision rates that are comparable to utilization rates due to the rationing of spots.

³ See German Federal Statistical Office, "Bildungsfinanzbericht 2016," (German Federal Statistical Office, Wiesbaden, 2016) (available online).

hold income groups bear a low or high burden? For the first time, the present study has systematically compiled pertinent information based on representative data for Germany as a whole.

Current studies on day care expenditures refer to single years only

The empirical studies on parental fees for day care centers currently available mainly refer to cross-sectional data sets that present the burden of day care payments on private households for a specific year. For example, an earlier study by the German Institute for Economic Research (DIW Berlin) showed that in 2012, the relative burden of households with expenditures in this area is highest in the lower income range.⁴ The burden was measured as the proportion of household income represented by the expenditure. The data from the AID:A survey on growing up in Germany, conducted by the German Youth Institute (*Deutsches Jugendinstitut*, DJI), showed that in 2009, five percent of day care spots were free in Germany and in 2.6 percent of cases, parents were exempt from paying the costs. Around 13 percent of parents paid less than 50 euros per month and 14 percent paid over 200 euros.⁵ And there are also major differences among federal states and regions: In 2014, the proportion of the total cost of day care financed by parents (without the co-payments of non-profit providers) ranged between seven percent in Berlin and around 22 percent in Mecklenburg-Western Pomerania.⁶

When questioned about the cost of day care centers, parents reported relatively high dissatisfaction in surveys.⁷ Analyses for 2010 also showed that some parents could not or did not want to use a day care center due to high costs. For this reason, one-fifth of the children between ages one and three did not attend a day care center. In

households with incomes below the median income,⁸ the proportion was even higher.⁹ A survey from 2016 indicated that at 46 percent, almost half of respondents with children in day care felt that the fees they paid were too high. There are also differences among federal states on this point.¹⁰

Wide variety despite national guidelines

Federal states and municipalities are generally responsible for setting parental fees for day care centers. However, the federal government sets the framework. Paragraph 90 of the Social Code VIII (*Sozialgesetzbuch, SGB VIII*)¹¹ stipulates that day care centers are permitted to charge fees when parents are deemed able to bear the financial burden. Since the end of 2008, there is also a national guideline that provides for sliding-scale fees—unless state law specifies otherwise. Parental income, the number of children with the right to receive the German child benefit, and the daily hours of care required are all on the list of possible criteria. Despite the guideline, the states can adopt other provisions. Ultimately, the federal states and municipalities decide on the actual fee schedule. Consequently, not only the method of calculating the fee amount and sliding scale—including the criteria used to determine it—are different; the provisions for fee waivers are as well.¹² In recent years, many states have implemented blanket fee waivers for all children in a specific age group, regardless of parental income (see Figure 1). Other states such as Mecklenburg-Western Pomerania and Bavaria grant a blanket subsidy of up to 100 euros per month for different age groups.

Fees for day care sometimes vary significantly within a federal state because some state provisions entitle the responsible provider or individual centers to specify concrete methods of calculation or even define their own sliding scales. The result is a wide variety of extremely different provisions despite the nationwide framework. Some studies have already assessed the difference in financial burden for families due to day care fees, depending on the region and the types of household and care. However, systematic research-based analyses that examine the trend in day care fees over a longer period of time of up

4 See Carsten Schröder, C. Katharina Spiess, and Johanna Storck, "Private Spending on Children's Education: Low-Income Families Pay Relatively More," *DIW Economic Bulletin* no. 8 (2015): 113–123 (available online).

5 See Dr. Marcus Hasselhorn et al., *Bildung in Deutschland 2014*, (Bertelsmann Verlag, Bielefeld, 2014) (available online).

6 See Kathrin Bock-Famulla, Eva Strunz, and Anna Löhle, *Länderreport früh-kindliche Bildungssysteme 2017* (Gütersloh: Bertelsmann Foundation, 2017). IW Consult has also studied the level of kindergarten fees in the 100 largest cities in Germany. See IW Consult, "Der INSM-ELTERN-Kindergartenmonitor 2010," (Website, Initiative Neue Soziale Marktwirtschaft (INSM)/ELTERN magazine, Berlin, 2010) (available online) On average, "normal earners" in all of the 100 major cities in the study pay 814 euros per year for one four-year-old and 935 euros per year for two children (ages 3 1/2 and 5 1/2). High-income families (annual gross income of €80,000 and over) must pay 1,280 euros and 1,468 euros respectively.

7 See Georg Camehl et al., "Does Better, Cheaper Day Care Make for More Satisfied Parents?" *DIW Economic Bulletin* no. 45/46 (2015): 604–611 (available online). For an additional study dealing with parents' satisfaction with day care costs, see Dietmar Hobler and Stefan Reuß, "Qualität und Quantität, bitte!" (Friedrich Ebert Foundation, Bonn/Berlin, 2016) (available online).

8 Also see the term *Medianeinkommen* in the DIW Berlin glossary (available online).

9 See Kai-Uwe Müller et al., "Evaluationsmodul: Förderung und Wohlergehen von Kindern," *DIW Politikberatung kompakt* no. 73 (2013) (available online).

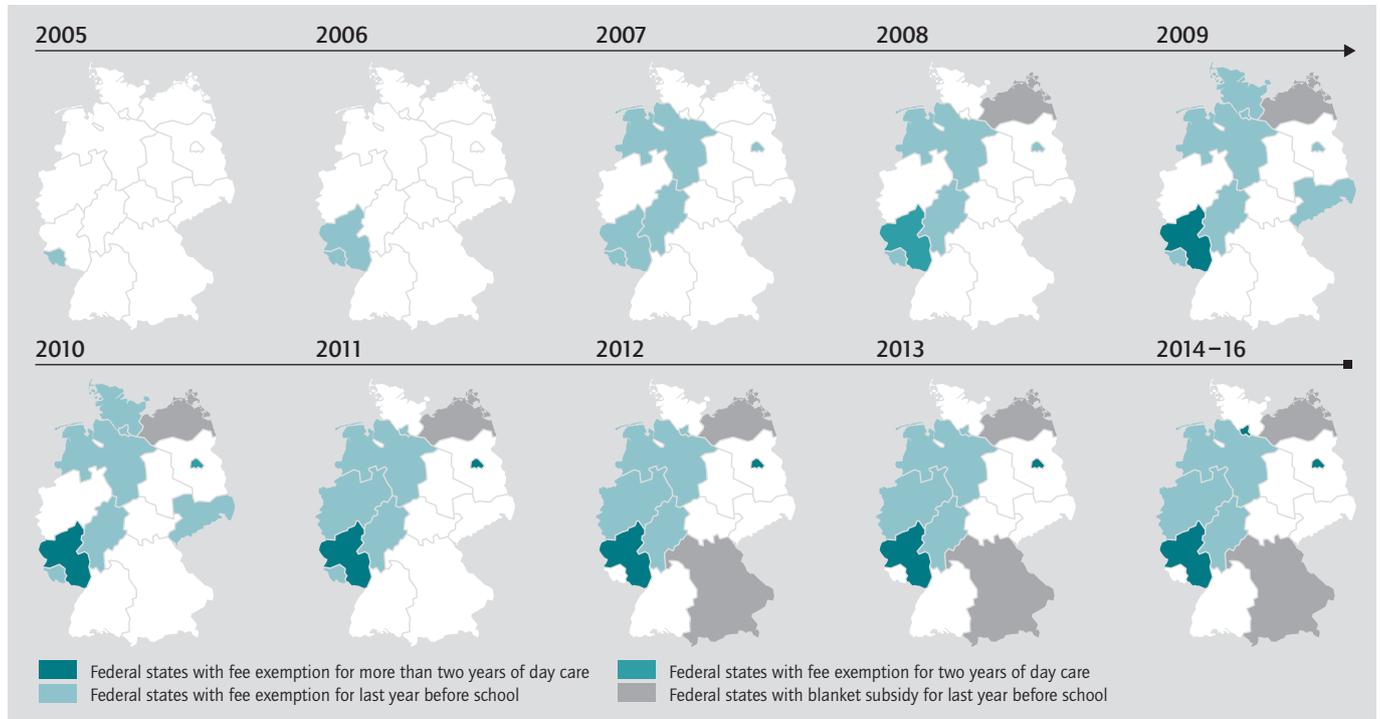
10 See Kathrin Bock-Famulla and Laura Holtbrink, "Kita-Qualität in Deutschland—Was wünschen sich Eltern?" (Bertelsmann Foundation/infratest dimap, Gütersloh, 2016) (available online)

11 See *Social Code VIII: Kinder- und Jugendhilfe*, 5th edition (Munich: VERLAG C.H.BECK, 2015).

12 See German Bundestag Scientific Service, "Regelungen zur Beteiligung der Eltern an den Kosten der Kindertagesbetreuung," (German Bundestag, Berlin, 2016) (available online).

Figure 1

Federal states with day care fee exemption for all households



Note: In some states the exemption of day care fees covers only a limited amount of hours (e.g. five hours per day).

Sources: Deutscher Bundestag (2016): *Regelungen zur Beteiligung der Eltern an den Kosten der Kindertagesbetreuung, Sachstandsbericht WD 9-3000-039/16, Wissenschaftlicher Dienst*; Kathrin Bock-Famulla, Jens Lange und Eva Strunz (2015): *Länderreport Frühkindliche Bildungssysteme 2013. Verlag Bertelsmann Stiftung*; authors' own research.

to 20 years—while considering differences among children based on characteristics such as household income, maternal level of education, or the number of children in the household in the process—have not been available until now.

Trend in day care expenditures over time examined for the first time

The present study first examined how day care expenditures have developed over time,¹³ for both all households in Germany with pre-school children and for various regions and types of household and care arrange-

ments. The analyses in this report are based on data from the German *Socio-Economic Panel* (SOEP) and the similarly structured *Families in Germany* (FiD) study (see box). Both studies report the day care expenses spent per child. The following analyses begin in 1996, the year in which the day care expenditures of private households were reported nationwide for the first time. Children under three (“U3 age group”) and preschool children three and older (Kindergarten age) are examined separately because they differ greatly in whether or not they attend day care and if so, how many hours per day.

U3 age group shows significant rise in day care expenditures

An analysis of average day care expenditures over time shows that in 2010 prices the monthly spending on Kindergarten age children (including those whose parents have no expenses) rose from around 71 euros in 1996 to 97 euros in 2015 (see Figure 2). This is an increase of around 37 percent. In the period 2005 to 2015, aver-

¹³ As shown in the box of the present study, the data set makes it possible to report the costs of one child's day care use. The question is formulated to facilitate collecting day care fee information. However, parents may also have included the additional costs they pay (e.g., for lunches) in their answers. In any case, strictly speaking, day care fees comprise the largest proportion by far of the sums indicated by parents. Moreover, it has to be assumed that income poor households who are reimbursed for their day care expenses report net expenses.

Box

Database and methodology

The analyses in this report are based on data from the German Socio-Economic Panel (SOEP) and the similarly structured *Families in Germany* (FiD) study. A representative survey conducted annually among private households, the SOEP was initiated in 1984.¹ Currently, each year over 30,000 people in around 17,000 households are requested to respond to questions on a variety of subjects. The FiD supplementary sample focuses on families with low incomes, families with multiple children, single parents, and families with very young children. In 2014, the FiD sample was first integrated into the SOEP. This allows the data sets to be analyzed together and provide a representative picture of Germany's population.

At irregular intervals, the two data sets record the costs households incur for the use of a day care center for one child on a monthly basis. In order to map the trend of monthly day care expenditures consistently, the present study includes information from 1996, 2002, 2005, 2007, 2013, and 2015. In these years, it was possible to separate the expenditures on day care per child from the household's expenditures on other activities of the child, such as leisure activities and informal supervision. Concretely, the households were asked the following question: "Is attendance of this facility [...] free of charge or do you have to pay a fixed sum [...]?" In 2013 and 2015, the question in the SOEP was changed to: "How much do you pay for the [...] facility?" The sample used consists of all families whose children used a crèche, nursery school or other type of day care facility at the time of the survey and in which the parents listed the amount of their expenditures on day care per child. Households with children who have a child minder were not included.²

¹ See Gert G. Wagner, Joachim R. Frick, and Jürgen Schupp (2007): "The German Socio-Economic Panel Study—Scope, evolution, and enhancements," *SOEPpapers* no. 1(2007) (available online) and Mathis Schröder, Rainer Siegers and C. Katharina Spieß (2013): Familien in Deutschland – FiD, in: Schmollers Jahrbuch. (133:595–606).

² Due to the wording of the question in 2002, it is not possible to eliminate the possibility that in 12 cases, the fees listed were for both day care and a child minder. However, this is irrelevant for the analysis in the present study.

For Kindergarten age children (from three to school enrolment age), the analyses in this study are primarily limited to the years 1996, 2005, and 2015. For children under three (U3 age group), they are mainly limited to 2005 and 2015, due to the low number of cases. This allows us to analyze the determinants and changes in day care expenditures over time periods of around 20 and ten years respectively. In addition to absolute expenditures, we examine the proportion of children whose parents did not pay for day care and day care expenditures relative to equivalence-weighted net household income. The day care expenditures are adjusted for inflation and included in all analyses as constant 2010 prices.

The focus of the present study is to map the trend in day care expenditures over time and examine the expenditures of different groups. First, we consider children in all households regardless of whether or not they paid for day care use. In addition, we only include those children whose parents paid for their day care. Further, we run *t tests* to compare the day care expenditures of different groups of Kindergarten age children between 1996 and 2015. In the process, we consider both the absolute expenditures and the portion of children whose parents did not pay for their day care. For the U3 age group, we also look at attendance rates.

In the following, we analyze the level of day care expenditures and likelihood of having them in multivariate linear regressions. We first use *probit models* to gauge the probability that specific groups would incur no day care expenditures at all. We also analyze the level of day care expenditures based on linear *OLS models* and censored *Tobit models*.³ In the former, we only include children whose parents paid for their day care, while the latter is based on all children. The standard errors account for serial correlations among various observations of one household.

³ For an explanation of the methodology, see William H. Greene (2008): *Econometric Analysis* 7th edition.

age expenditures rose by eight percent. This means that expenditures in this area rose much more sharply before the mid-2000s than after that time. Until then, only a few children were completely exempt from payment. In the past ten years, the situation has changed. First, several federal states implemented a blanket exemption and second, more laws were amended to include sliding scale fees. For example, in 2015 households subject to day care expenditures for their Kindergarten age chil-

dren paid on average 18 euros more than when children who did not incur any day care costs were included in the calculation. Until 2005, the difference was smaller.

Considering costs, the U3 age group decoupled from the Kindergarten age group in 2005. Day care expenditures on children under three were 98 euros in 2005—approximately the same level as those for older children (90 euros). They rose sharply in subsequent years (see

Figure 2).¹⁴ In 2015, parents paid an average of 171 euros per month, which is an increase of just under 75 percent. For comparison: for Kindergarten age children, the increase was eight percent. When children whose parents pay nothing are excluded, the average monthly expenditure was equal to 188 euros per child.

Households on or below the poverty line have a rather high burden

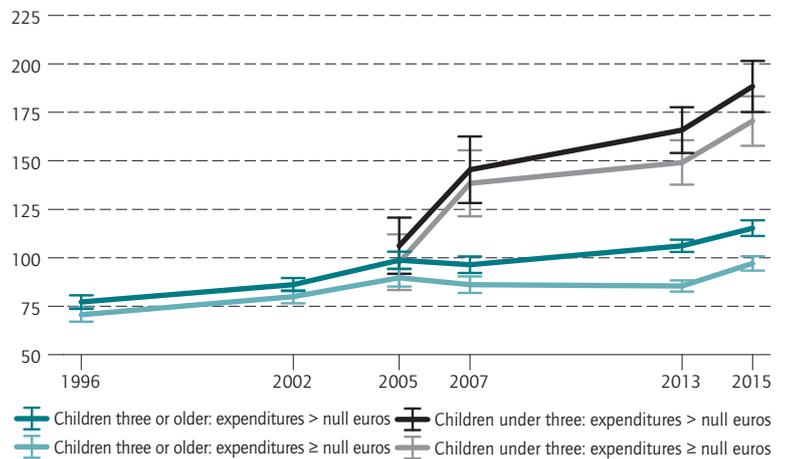
It is particularly interesting to observe the extent to which households on or below the poverty line have been affected by the 20-year increase in day care expenditures. After all, for them the level of parental expenditures might be a key factor in deciding whether or not to use day care. In general, lower day care expenditures enable these households to spend the money they “save” on other educational activities for their children. As early as the 1990s, households with Kindergarten age children with an income on or below the national poverty line¹⁵ had lower day care expenditures per child than households above it (see Figure 3, left). Between 1996 and 2005, the average expenditures for households above and below the poverty line with day care expenditures rose by similar amounts. After 2005 the picture is different. While households above the poverty line still paid more, the expenditures for children in households on or below the poverty line, provided that they had expenditures, fell from 80 euros to 48 euros. These results are a strong indication that over time, parents’ fees became more rigorously scaled according to household income in many regions of Germany. Looking at the absolute sums in euros, this trend benefited lower-income households with preschool children more than other family households.¹⁶

However, it does not indicate the relative burden. Relating the expenditure per child to the equivalence-weighted net household income¹⁷ shows that for 2005, households on or below the poverty line had day care expenditures

Figure 2

Monthly day care expenditures by age groups

In euros, 95-percent-confidence-intervals



Note: Monthly day care expenditures in constant 2010 prices. For children under the age of three expenditures only shown since 2005 due to low number of cases.

Source: SOEP v32, weighted; authors’ own calculations.

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The day care expenditures increased since 1996, in particular for children in the so called U3 age group.

per child amounting to around 11 percent of their household income (see Figure 3, right). The corresponding proportion for households above the poverty line was seven percent. Afterward, the relative burden of the two groups approached a similar level and by 2015, they were both just under eight percent. On the contrary, examining the expenditure per child relative to income for all households—including those that did not have any day care costs—shows that households at risk of poverty first expended a lower proportion of their income than higher-income households in 2015.

Lower income groups and non-employed mothers benefit from trend toward more fee exemptions

Detailed studies that include several characteristics show that the proportion of Kindergarten age children whose parents pay for day care decreased by around seven percentage points to 84 percent between 1996 and 2015 (see Table 1). In western Germany, the decline of eight percentage points was sharper than in eastern Germany, where it was four percentage points. In 2015, parents spent an average of 20 euros more for day care in the eastern German states than in the western German ones. In particular in smaller and medium-sized municipalities, the expenditures have increased with statistical significance.

¹⁴ Due to the lower number of cases or greater fee dispersion, the fees for this age group could not be calculated entirely precisely.

¹⁵ The poverty line is 60 percent of the equivalence-weighted, nationwide median income. For the poverty line of the overall population, see SOEP Group, “SOEP 2013 – SOEPmonitor Household 1984–2013 (SOEP v30),” *SOEP Survey Papers* no. 283 (2015) (available online). For 2015, we made our own analogous calculation.

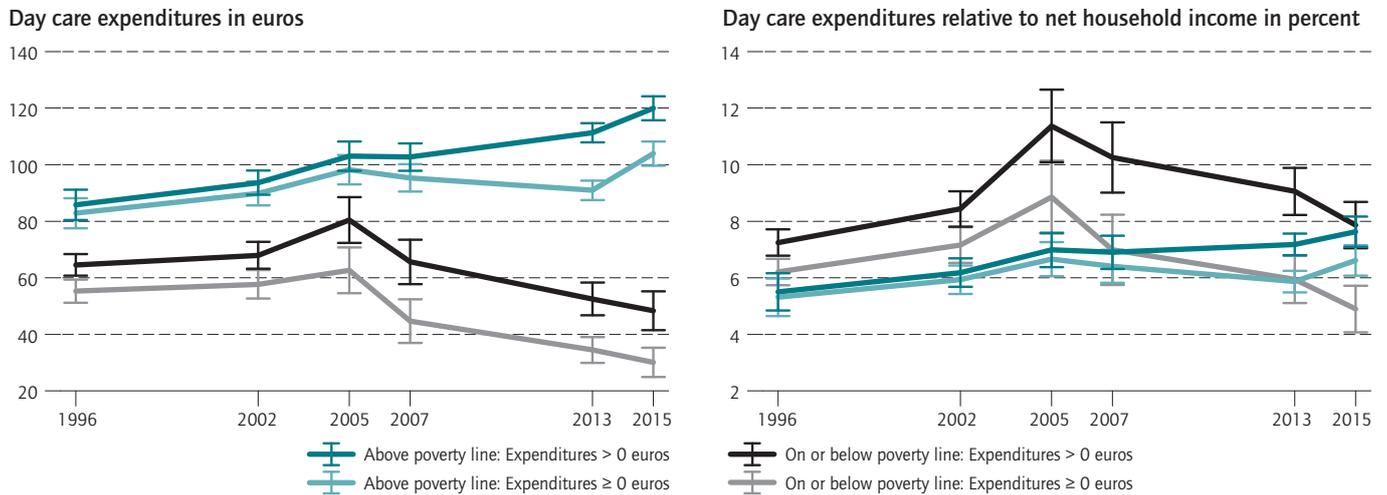
¹⁶ Several federal states regulated a sliding scale for the fees before the change in SGB VIII at the end of 2008. This could explain why the fees of families on and below the poverty line fell already in 2007.

¹⁷ To make net household incomes comparable across the various household types, we divided household income by a household-specific equivalence scale; in this case, the modified OECD scale. This ratio is called needs-adjusted income. For more on the concept of needs-adjusted or equivalence-weighted income, see Carsten Schröder and Timm Bönke, “Country inequality rankings and conversion schemes,” *Economics—The Open-Access, Open-Assessment EJournal* vol. 6, 2012–28 (2012). (available online). Also see the term *Äquivalenzeinkommen* in the DIW Berlin glossary. (available online).

Figure 3

Children three and over in day care centers: expenditures

In euros and relative to income by poverty risk of the household



Note: Monthly day care expenditures in constant 2010 prices. The poverty line is 60 percent of the equivalence-weighted nationwide median income.

Source: SOEP v32, weighted; authors' own calculations.

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Day care expenditures increased for children in households above the poverty line and decreased for children in households on or below the poverty line.

Further, the average expenditures on Kindergarten age children who are in full-day care¹⁸ have risen by almost 38 euros, a considerably sharper increase than for children who attend part-time. For the latter, the increase of around eight euros is not in the statistically significant range. In this group, the proportion of children in households that must pay to use day care has significantly fallen over time—by 14 percent. Children in publicly funded child care, that is either publicly provided or provided by a non-profit organization, have benefited to similar extents from the trend toward greater numbers of fee exemptions.

Higher-income households or those in which mothers worked full time felt most of the effect of the rise in absolute day care expenditures on Kindergarten age children. There were no significant increases between 1996 and 2015 for children of non-employed mothers or for children from households in the lowest income quartile (the 25 percent of households in Germany with the lowest incomes), those that receive transfer benefits or those with single parents. Indeed, households with non-employed mothers or low incomes paid nothing for their

use of day care with significantly greater frequency. They obviously benefited strongly from fee payment exemption, particularly when comparing 2005 and 2015.

In line with the framework established by Social Code VIII, households had to consistently expend less on day care if siblings lived in the household, even if the absolute rise in expenditures over time for children in Kindergarten age was somewhat higher than it was for households without multiple children. As anticipated, households with children between three and four years of age had a greater burden. In 2015 parents had no expenditures on older children more frequently compared to 1996, since they typically benefited from blanket fee exemptions the year before their child started school.

Looking at the relative burden on households measured by net household income, all households as of the second income quartile demonstrated an increase in their relative burden from day care expenditures on their child (see Table 2). This applies to the comparison of 1996 to 2015. It is also noteworthy that the 25 percent of households with the highest income had a relatively low burden over the entire period. Breaking down the financial burden arising from day care expenditures by the size of the place of residence shows that over time, the relative burden of families has risen appreciably in munic-

¹⁸ As of 2009, defined as at least seven hours per day. Before then SOEP did not collect precise periods of use. However, respondents were asked to indicate whether their child attended a day care center full-time or part-time only.

DAY CARE CENTERS

Table 1

Children aged three years and above in day care centers: monthly day care expenditures per child

	1996 (1)		2005 (2)		2015 (3)		Difference 1996 and 2015 (3) - (1)	
	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros in percentage points
Germany overall	70.7	91.6	90.0	91.1	97.2	84.2	26.5***	-7.4***
Regional characteristics								
East-West Germany								
East Germany	83.2	94.9	91.2	90.1	114.5	90.7	31.3**	-4.3
West Germany	68.4	91.0	89.8	91.3	94.0	83.0	25.6***	-8.0***
Size of municipality								
Less than 20,000 inhabitants	59.6	92.5	81.5	93.5	92.1	86.4	32.4***	-6.0**
20,000 to 100,000 inhabitants	72.4	91.5	91.7	89.2	100.2	79.3	27.8***	-12.2**
More than 100,000 inhabitants	86.9	90.3	101.5	89.4	99.8	86.0	12.9	-4.3
Characteristics of day care usage								
Hours in day care								
Half day	68.0	92.2	78.5	90.0	76.1	78.1	8.1	-14.1***
Full day	81.7	95.5	115.9	93.0	119.2	90.6	37.5***	-4.9*
Provider								
Public provider			85.0	89.5	91.4	82.0	6.4	-7.6***
Non-profit provider			96.5	92.7	95.2	84.2	-1.4	-8.5***
Private/company provider			(95.2)	(100.0)	140.5	97.6	45.3**	-2.4**
Household characteristics								
Net household income (equivalence-weighted) ¹								
1. Quartile	51.7	85.4	62.2	77.4	43.9	69.9	-7.7	-15.5***
2. Quartile	59.5	86.1	83.7	94.1	84.1	85.0	24.5***	-1.2
3. Quartile	77.7	97.5	92.0	97.6	116.4	90.6	38.7***	-6.8**
4. Quartile	88.3	95.5	118.9	95.4	142.6	91.3	54.3***	-4.2
Transfer benefits ²								
Receive transfer benefits	(30.0)	(60.8)	52.3	73.3	25.8	64.8	-4.2	4.1
Do not receive transfer benefits	73.6	93.7	94.8	93.4	104.2	87.1	30.6***	-6.7***
Family status								
Single parent	64.0	81.2	58.4	74.8	64.6	75.1	0.6	-6.1
Couple household	71.3	92.5	95.3	93.8	101.7	85.5	30.4***	-7.0***
Characteristics of mother								
Employment of mother								
Not employed	64.6	89.7	73.1	85.9	63.5	72.5	-1.1	-17.2***
Part time employed	70.2	92.5	99.4	93.7	106.2	88.7	36.0***	-3.8
Full time employed	93.1	95.7	120.0	99.9	143.7	95.0	50.6***	-0.7
Highest educational degree of mother								
No or lower degree	49.5	74.3	62.6	80.8	51.5	71.5	2.0	-2.8
Vocational degree	75.3	95.6	89.0	92.4	94.7	86.4	19.4***	-9.2***
University degree	81.8	95.3	131.7	95.5	132.6	88.7	50.7***	-6.6

Continuation Table 1

Children aged three years and above in day care centers: monthly day care expenditures per child

	1996 (1)		2005 (2)		2015 (3)		Difference 1996 and 2015 (3) - (1)	
	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Amount of day care expenditures ≥ 0 euros (in euros)	Day care expenditures > 0 euros in percentage points
Characteristics of child								
Age of child								
3-4 years	70.7	92.5	88.5	89.8	108.6	87.8	37.9***	-4.7
5 years and older	70.7	90.9	90.7	91.8	82.7	79.8	12.1**	-11.2***
Siblings of child in day care								
Siblings	64.4	90.7	80.4	89.9	92.0	84.1	27.6***	-6.6***
No siblings	90.9	94.5	116.4	94.3	111.7	84.7	20.7*	-9.8**
Migration background of child in day care								
Direct or indirect migration background	75.0	87.4	85.4	90.8	85.9	81.5	10.8	-6.0
No migration background	69.6	92.7	91.7	91.2	102.9	86.0	33.3***	-6.7***
N³	625	625	865	865	2,193	2,193		

Notes: Monthly day care expenditures in constant 2010 prices. Case numbers below 40 are depicted in brackets. Difference between column (3) and (1) are tested for significance by t-tests. Due to missing information on the provider, the difference by provider is calculated between 2005 and 2015.

***, **, * Significant at 1-, 5- und 10-percent-level.

1 Boundaries of the equivalence-weighted monthly net household income quartiles vary by year. Example for 2015: 1. Quartile $\leq 1,048$ euros, 2. Quartile 1,049 to 1,429 euros, 3. Quartile 1,430 to 1,945 euros, 4. Quartile $\geq 1,946$ euros.

2 Transfer benefits are captured on the household level.

3 Small deviations in the number of observations depending on missing values in certain characteristics.

Source: SOEP v32, weighted; authors' own calculations.

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ipalities with less than 20,000 residents. For larger cities, we did not observe any significant changes over time.

Proportion of U3 children whose parents have no day care expenses virtually constant

Significantly more children in the U₃ age group went to day care in 2015 than in 2005, and day care expenditures on them rose sharply (see Table 3). At 93 euros, the increase in western Germany was much higher than in eastern Germany (34 euros). It is noteworthy that the proportion of children whose parents paid for day care even significantly increased in larger cities. For children with half-day spots, day care expenditures rose more sharply than for those in full-day care.

Due to the low number of cases, we did not present the trend for other household characteristics over time. However, a cross-section showed that in 2015, 74 percent of households in the lowest income quartile paid for day care for their child, and their average expenditures were significantly lower than those of the other households.

Regression analyses confirm increasing frequency of sliding scale fees based on income over time

Using multivariate regression analyses for Kindergarten age children, we are able to calculate the influence of socio-economic and demographic characteristics, such as household income, maternal level of education, or migration background, and indicate how day care expenditures developed while taking these potential influences into consideration. Our results confirm that the proportion of Kindergarten age children whose parents paid for day care was eight percentage points lower than it was in 1996 (see Table 4, Column 4). At least part of this decrease should be due to the blanket day care fee exemption implemented by an increasing number of federal states since 2006.

The current findings with regard to the differences among groups provide general confirmation of the previous results, although overall the differences are smaller. Importantly, the results presented should not be interpreted in the sense of trends over time. The estimates

are based on a data set that pools observations from three years. The results show the following: Households with incomes in the top quartile, for example, were more likely to have day care expenditures by around seven percentage points in comparison to the bottom quartile. On the contrary, single parents had a significantly lower likelihood in comparison to households with couples.

The rise in day care expenditures over time remained statistically significant when considering various characteristics (see Table 4, Column 1). Compared to 1996, parents paid just under 18 euros more per month for their Kindergarten age children in 2015. Hence, approximately one-third of the expenditure increase of just under 27 euros presented above can be explained by changes, e.g., the more frequent use of full-day care or increased income. It is striking that there is no longer a significant east-west difference in the day care expenditures. This indicates that the higher expenditures in eastern Germany might be due to longer daily care hours.

Excluding children whose parents do not have day care expenditures, the expenditures rose even more sharply over time: by around 28 euros in 2005 and 30 euros in 2015 as compared to reference year 1996 (see Table 4, Column 2). Finally, the results confirm that day care expenditures in higher income groups rose more sharply, while for the lowest income group the increase was only around 24 euros in 2005 (see Table 4, Column 3, top row). This obviously results from the increasing frequency of sliding scale fees based on income: While parents from households in the top income quartile paid an average of 17 euros more for their children in 1996 than¹⁹ the parents from households in the bottom income quartile, this difference increased by an additional 42 euros in 2015. The difference in expenditure growth by income could therefore not just be due to differences in use behavior or other characteristics such as the child's age, even though these characteristics often have significant associations with the fees paid.

Considering other characteristics reduces expenditure increase in U3 age group

For children in the U3 age group, day care expenditures per child rose by around 51 euros between 2005 and 2015 (see Table 5, Column 1). Here as well, the original increase of 73 euros is approximately one-third lower if household income and additional characteristics are considered. The household income and whether or not the mother is employed have a positive relationship with the level of

¹⁹ The interpretation of the coefficients changes as a result of the interaction between survey years and the net household income quartile. The coefficients of net household income should now be interpreted in reference to the first income quartile in survey year 1996.

Table 2

Children aged three and above in day care centers: day care expenditures relative to net household income

	1996 (1)	2005 (2)	2015 (3)	Difference 1996 and 2015 (3) - (1)
	relative day care expenditures ≥ 0 euros (in percent)			(in percentage points)
Germany overall	5.7	7.1	6.4	0.7**
Regional characteristics				
East-West Germany				
East Germany	7.6	7.8	9.5	1.9
West Germany	5.3	7.0	5.9	0.5*
Size of municipality				
Less than 20,000 inhabitants	5.2	6.9	6.8	1.6***
20,000 to 100,000 inhabitants	5.8	7.7	6.7	0.9
More than 100,000 inhabitants	6.4	6.8	5.8	-0.6
Household characteristics				
Net household income (equivalence-weighted) ¹				
1. Quartile	6.8	8.6	5.6	-1.2
2. Quartile	5.7	7.7	7.1	1.5**
3. Quartile	6.0	6.7	7.2	1.2***
4. Quartile	4.5	5.7	5.8	1.3***
Transfer benefits ²				
Receive transfer benefits	(5.50)	6.7	3.4	-2.1
Do not receive transfer benefits	5.8	7.2	6.7	0.9***
Family status				
Single parent	(5.57)	7.3	6.5	1.0***
Couple household	7.2	6.1	5.9	-1.4
N ³	604	826	2,121	

Notes and footnotes see Table 1. All expenditures ≥ euros are considered relative to the net household income.

Source: SOEP v32, weighted; authors' own calculations.

expenditure. For example, households in the top income quartile spent almost 81 euros more per child for day care than households in the bottom income quartile. Households receiving transfers and households with more than one child paid an average of 50 euros and 31 euros less for their child's day care, respectively. On the contrary, single parents and households that use a half-day spot did not have significantly lower expenditures. The findings are similar if children whose parents do not pay anything for day care are excluded (see Table 5, Column 2).

Conclusion

On average over the past 20 years, private households have had to spend more and more money on day care for their children. However, comparing disparate house-

Table 3

Children under the age of three in day care centers: monthly day care expenditures per child

	2005 (1)			2015 (2)			Difference 2005 and 2015 (2) - (1)		
	Amount of day care expenditures \geq 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Day care attendance (in percent)	Amount of day care expenditures \geq 0 euros (in euros)	Day care expenditures > 0 euros (in percent)	Day care attendance (in percent)	Amount of day care expenditures \geq 0 euros (in euros)	Day care expenditures > 0 euros (in percentage points)	Day care attendance (in percentage points)
Germany overall	97.7	92.0	12.2	170.5	90.5	31.8	72.8***	-1.5	19.6***
Regional characteristics									
East-West Germany									
East Germany	108.6	94.0	36.4	142.8	90.0	46.1	34.1**	-3.9	9.7
West Germany	85.1	89.7	6.7	177.9	90.6	29.4	92.8***	0.9	22.7***
Size of municipality									
Less than 20,000 inhabitants	111.3	100.0	13.7	144.1	86.9	27.0	32.8**	-13.1***	13.3***
20,000 to 100,000 inhabitants	(98.2)	(94.7)	10.8	178.5	90.0	21.9	80.4***	-4.7	11.1**
More than 100,000 inhabitants	(78.4)	(78.4)	11.6	185.6	93.2	46.0	107.2***	14.8*	34.5***
Characteristics of day care usage									
Hours in day care									
Half day	91.0	93.8		172.5	86.9		81.5***	-6.9	
Full day	112.0	88.0		168.1	94.0		56.1***	6.0	
N ³	108	108	734	421	421	1,396			

Notes see Table 1.

Source: SOEP v32, weighted; authors' own calculations.

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holds among one another reveals major differences. After all, while households with more income paid significantly more, an increasing proportion of households were exempt from paying fees, and the relative burden due to day care expenditures for households on or below the poverty line decreased. Overall, the results indicate that the sliding scale for day care fees stipulated in federal law is being applied, and characteristics such as income and number of siblings are being considered when setting fees. At least a portion of the rise in expenditures for households with children is due to the fact that the characteristics of children and the parents who pay day care fees, for example household income as well as modes of use, have changed over time. Another reason for the rise could be that day care teachers are paid more, leading to "price increases." In any case, the increasing number of federal states that completely exempt parents from payment in the year before the child starts school, for example, is also having an impact, as is visible in the increasing proportion of households that do not have day care expenditures for their children.

The relative burden on all households on or below the poverty line due to day care expenditures has diminished over time and is now lower than for other households. However, the relative burden of households on or below the poverty line that actually have day care expenses is still

not lower than that of higher income households. This would be the point of departure if income poor households should be further relieved from a social policy perspective. For this reason, policy makers at all levels should not be considering blanket exemption. Instead, they should strive for a more sharply defined and targeted income progression when setting fees for day care. This would also be useful because households with higher incomes are often willing to pay even higher day care fees. According to surveys, they are willing to pay more even if their fees have no relation to the quality of care their children would receive.²⁰ If the quality were improved, 48 percent—almost half—of parents with children in day care would be willing to pay higher fees. This proportion also increases with income.²¹

Policy makers would therefore be well advised to invest additional public funds in improving the quality of day care services and expanding day care for the U₃ age group, where demand is not yet entirely satisfied. Systematic relief should be provided to lower income households under binding regulations that apply nationwide and go beyond the current framework provisions of the Social Code VIII.²²

²⁰ See Camehl et al. (2015), "Better, Cheaper Day Care."

²¹ See Bock-Famulla et al. (2017), *Ländereport*.

²² Also see C. Katharina Spiess, "Quo Vadis Kita-Beiträge," *Wirtschaftsdienst* 97, 9: (2017): 651-654.

Table 4

Children aged three years and above in day care centers: associations between day care expenditures and socio-economic characteristics

	Amount of day care expenditure in euros			Day care expenditures
	expenditures ≥ 0 euros	expenditures > 0 euros	expenditures > 0 euros – with interactions	> 0 euros (in percent)
	Model (1)	Model (2)	Model (3)	Model (4)
Year				
1996			<i>Reference</i>	
2005	26.71*** (5.92)	27.67*** (5.70)	23.52*** (7.02)	0.00 (0.01)
2015	17.75*** (5.39)	29.79*** (5.31)	2.16 (8.17)	-0.08*** (0.02)
Regional characteristics				
West Germany			<i>Reference</i>	
East Germany	-21.04 (18.09)	-25.98 (17.08)	-25.83 (17.24)	0.03 (0.04)
Less than 20,000 inhabitants			<i>Reference</i>	
20,000 to 100,000 inhabitants	9.24* (4.72)	13.39*** (4.21)	13.49*** (4.06)	-0.02 (0.02)
More than 100,000 inhabitants	21.15*** (4.72)	24.29*** (4.47)	24.36*** (4.43)	-0.01 (0.02)
Characteristics of day care usage				
Half day			<i>Reference</i>	
Full day	34.11*** (5.35)	27.88*** (5.31)	26.84*** (5.30)	0.06*** (0.01)
Public provider			<i>Reference</i>	
Non-profit provider	-3.293 (5.24)	-1.788 (5.14)	-1.315 (5.02)	-0.01 (0.01)
Private/company provider	28.06*** (9.67)	17.48* (9.94)	15.60 (9.61)	0.10*** (0.03)
Household characteristics				
Income in 1. Quartile ¹			<i>Reference</i>	
Income in 2. Quartile	9.66* (5.04)	2.26 (4.55)	-6.67 (5.08)	0.05** (0.02)
Income in 3. Quartile	24.44*** (4.88)	13.45*** (4.45)	6.60 (4.79)	0.08*** (0.02)
Income in 4. Quartile	37.54*** (6.30)	30.39*** (6.00)	16.96* (8.94)	0.07*** (0.02)
Do not receive transfer benefits			<i>Reference</i>	
Receive transfer benefits	-38.30*** (6.52)	-32.28*** (5.87)	-26.78*** (6.05)	-0.03 (0.02)
Couple household			<i>Reference</i>	
Single parent	-22.47*** (6.46)	-13.87** (5.92)	-14.53** (5.76)	-0.06*** (0.02)
Characteristics of mother				
Not employed			<i>Reference</i>	
Part time employed	5.65 (4.08)	1.62 (3.61)	1.23 (3.61)	0.02 (0.01)
Full time employed	19.57*** (6.58)	11.83* (6.29)	11.79* (6.39)	0.07*** (0.02)

Continuation Table 4

Children aged three years and above in day care centers: associations between day care expenditures and socio-economic characteristics

	Amount of day care expenditure in euros			Day care expenditures > 0 euros (in percent)
	expenditures ≥ 0 euros	expenditures > 0 euros	expenditures > 0 euros – with interactions	
	Model (1)	Model (2)	Model (3)	Model (4)
No or lower degree			<i>Reference</i>	
Vocational degree	16.98*** (4.79)	8.86** (3.50)	8.74** (3.45)	0.06*** (0.02)
University degree	31.27*** (8.42)	25.99*** (7.34)	24.51*** (7.48)	0.05** (0.02)
Characteristics of child				
3 years			<i>Reference</i>	
4 years	-0.73 (5.33)	0.87 (4.98)	1.54 (4.86)	-0.01 (0.02)
5 years	-2.84 (5.31)	-1.12 (5.28)	-1.05 (5.27)	-0.02 (0.02)
6 years and older	-13.30*** (5.04)	-6.23 (4.48)	-6.41 (4.33)	-0.05*** (0.02)
No siblings			<i>Reference</i>	
Siblings	-14.71*** (5.07)	-14.97*** (4.76)	-15.19*** (4.83)	-0.01 (0.02)
No migration background				
Direct or indirect migration background	4.03 (4.32)	3.80 (3.88)	4.10 (3.85)	0.01 (0.02)
Interactions				
2005 * Income in 1. Quartile			<i>Reference</i>	
2005 * Income in 2. Quartile			7.18 (9.02)	
2005 * Income in 3. Quartile			-3.42 (7.84)	
2005 * Income in 4. Quartile			9.88 (13.39)	
2015 * Income in 1. Quartile			<i>Reference</i>	
2015 * Income in 2. Quartile			27.21** (11.32)	
2015 * Income in 3. Quartile			33.72*** (9.75)	
2015 * Income in 4. Quartile			41.69*** (13.03)	
Constant		90.32*** (9.41)	97.95*** (9.54)	
N	3,683	3,127	3,127	3,683
Pseudo-R ²	0.035			0.211
Adjusted R ²		0.31	0.317	

Notes: Model (1): Marginal effects of a censored regression model (Tobit). Model (2): Coefficients of a linear regression model. Model (3): Coefficients of a linear regression model with interactions between income groups and year. Model (4): Average marginal effects of a Probit Model.

Standard errors are clustered on the household level and depicted in brackets.

***, **, * Significant at 1-, 5- and 10-percent-level. For further notes and footnotes see Table 1.

Source: SOEP v32, weighted; authors' own calculations.

Table 5

Children under the age of three in day care centers: associations between day care expenditures and socio-economic characteristics

	Amount of day care expenditure in euros	
	expenditures ≥ 0 euros	expenditures > 0 Euro
	Model (1)	Model (2)
Year		
2005	<i>Reference</i>	
2015	50.52*** (13.43)	56.79*** (12.58)
Regional characteristics		
West Germany	<i>Reference</i>	
East Germany	-4.09 (14.56)	-3.20 (13.90)
Less than 20.000 inhabitants	<i>Reference</i>	
20.000 to 100.000 inhabitants	10.85 (14.42)	4.43 (14.05)
More than 100.000 inhabitants	12.32 (16.67)	9.82 (16.81)
Characteristics of day care usage		
Half day	<i>Reference</i>	
Full day	4.98 (12.14)	-1.57 (12.22)
Public provider	<i>Reference</i>	
Non-profit provider	-15.62 (11.34)	-11.89 (11.30)
Private/company provider	69.83*** (21.57)	68.20*** (22.62)
Household characteristics		
Income in 1. Quartile ¹	<i>Reference</i>	
Income in 2. Quartile	0.52 (13.98)	-1.01 (15.05)
Income in 3. Quartile	46.67*** (17.36)	53.43*** (17.23)
Income in 4. Quartile	80.55*** (18.35)	85.95*** (18.86)
Do not receive transfer benefits	<i>Reference</i>	
Receive transfer benefits	-50.12*** (18.61)	-41.30** (18.47)
Couple household	<i>Reference</i>	
Single parent	-19.73 (15.97)	-9.21 (15.92)

Continuation Table 5

	Amount of day care expenditure in euros	
	expenditures ≥ 0 euros	expenditures > 0 Euro
	Model (1)	Model (2)
Characteristics of mother		
Not employed	<i>Reference</i>	
Part time employed	29.70** (12.98)	20.50 (12.63)
Full time employed	43.55** (17.08)	31.00* (16.70)
No or lower degree	<i>Reference</i>	
Vocational degree	24.21 (14.84)	3.57 (14.01)
University degree	41.79** (16.93)	17.49 (16.04)
Characteristics of child		
0-1 year	<i>Reference</i>	
2 years	-0.51 (10.71)	5.54 (11.04)
No siblings	<i>Reference</i>	
Siblings	-30.57*** (10.38)	-31.54*** (10.35)
No migration background	<i>Reference</i>	
Direct or indirect migration background	-0.89 (13.23)	-1.38 (12.94)
Constant		92.22* (47.93)
N	529	461
Pseudo-R ²	0.065	
Adjusted R ²		0.485

Notes: Model (1): Marginal effects of a censored regression model (Tobit). Model (2): Coefficients of a linear regression model.

All models control for federal state specific fixed effects.

***, **, * Significant at 1-, 5- und 10-percent-level. For further notes and footnotes see Table 1.

Source: SOEP v32, weighted; authors' own calculations.

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Sophia Schmitz is a Research Associate in the Education and Family Department at DIW Berlin | sschmitz@diw.de

C. Katharina Spieß is Head of the Education and Family Department at DIW Berlin | kspiess@diw.de

Juliane F. Stahl was a Research Associate in the Education and Family Department at DIW Berlin | jstahl@diw.de

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