

## Volume 36, Issue 1

### Seasonal effects in the use of paternity leave in Germany

Sven Stöwhase

*Fraunhofer Institute for Applied Information Technology*  
*FIT*

Teodora Shipanova

*Fraunhofer Institute for Applied Information Technology*  
*FIT*

#### Abstract

This short note uses a large administrative data set on the use of parental leave in Germany to explore whether fathers take paternity leave more often in some months than in others. Our results indicate that paternity leave is taken to a significantly greater extent during summer - independent from when the child is exactly born. Moreover, these seasonal effects are more pronounced when the total leave is shorter.

---

We are grateful to William Blankenau and an anonymous referee for providing us with helpful comment. We also thank Leif Jacobs for valuable research assistance.

**Citation:** Sven Stöwhase and Teodora Shipanova, (2016) "Seasonal effects in the use of paternity leave in Germany", *Economics Bulletin*, Volume 36, Issue 1, pages 373-380

**Contact:** Sven Stöwhase - [sven.stoewhase@fit.fraunhofer.de](mailto:sven.stoewhase@fit.fraunhofer.de), Teodora Shipanova - [teodora.shipanova@fit.fraunhofer.de](mailto:teodora.shipanova@fit.fraunhofer.de).

**Submitted:** November 02, 2015. **Published:** March 17, 2016.

## 1 Introduction

Over the past decades, the majority of European countries have implemented individual parental leave entitlements for fathers, which are not transferable to mothers. The aim of these policy changes was to increase fathers' involvement in housework and childcare at least in the early months after birth by the payment of replacement benefits to those fathers taking a leave (Bruning and Plantenga, 1999, Duvander et al., 2010, Ekberg et al., 2013). While the maximum number of weeks and the compensation rate of paid leave vary significantly among countries, there is first evidence that these policies indeed increased the proportion of fathers taking leave time (see e.g. Ekberg et al., 2013, for Sweden, Patnaik, 2015, for Canada, or Wrohlich et al., 2012, for Germany).

Beyond this rather general result of an increased take-up, still relatively few details are known about fathers' use of paternity leave. Duvander (2014) investigates which factors determine the length of paternity leave, while Ekberg et al. (2013) find significant seasonal variation in the usage of paternity leave in Sweden for births at the turn of the year 1994/1995. Their analysis reveals that paternity leave was particularly taken during the summer months. The underlying data, however, comprises only births in the second half of December 1994 and the first half of January 1995. It is possible that different patterns exist for births in different months of the year. Hence, in order to dismantle seasonal effects from cohort effects, it should be tested whether their result can be confirmed for births in months other than December and January. Moreover, it would be interesting to know if such seasonal effects in the use of paternity leave are limited to Sweden or if similar effects can be observed for other countries as well.

The aim of this paper is to analyze these two issues. Therefore, it draws on administrative micro data on the use of parental leave in Germany that includes information on all parents with a child born in 2013 who actually took parental leave. A first statistical analysis of the data confirms the findings of Ekberg et al. (2013) for Sweden, that paternity leave is taken to a significantly greater extent during summer. The observed pattern stems from two different effects. The first is a preference to take parental leave in the two months following childbirth and around the first birthday of the child that coincides with an increased number of births in summer. Second, fathers who do not prefer to take parental leave straight after childbirth or around the first birthday have a clear preference for the summer.

The remainder of this paper is organized as follows: Section 2 describes the institutional background of paternity leave in Germany and the data used for our analysis. Section 3 presents the empirical results and Section 4 concludes.

## 2 Institutional Background and Data

In 2007, Germany implemented a parental leave scheme which allows both the father and the mother of a newborn (or adopted) child to devote longer periods of time to their family life. Parents are entitled to a maximum of 14 months of paid leave time. The monthly compensation rate during the leave varies between 65 and 100 percent of former net earnings with a minimum of €300 and a maximum value of €1,800. The total leave-entitlement of 14 months can be divided flexibly between the two parents with the restrictions that, if a parent chooses to take parental leave, the minimum leave is two months, and that no parent is allowed to take more than twelve months of parental leave.<sup>1</sup> Months can only be taken as a whole and, if mothers want to take parental leave, they are required to take parental leave during months they receive maternity leave benefits – usually the first eight weeks after childbirth. The remaining months of parental leave entitlement can be taken non-contiguously and a simultaneous use by both parents is possible at any time. Fathers can thus choose two to twelve (in case of single-fathers even up to 14) months of paid leave within any of the first 14 months after childbirth.

The German Federal Statistical Office provides us with the *Elterngeldstatistik 2013*, a process produced administrative data set on parental leave, covering all parents with a child born in 2013 who actually took parental leave in 2013, 2014, or in the first quarter of 2015. Thus, the data covers all months of parental leave entitlement for children born in 2013. According to this information, 874,578 parents of children born in 2013 took parental leave, among them 657,033 mothers and 217,545 fathers. While mothers took 11.6 months of parental leave on average, with 3.1 months fathers' leave was substantially shorter.

For each parent who took at least one month of parental leave, the data includes some general information such as the date of birth of the child, whether it was a multiple birth, the date of birth and marital status of the parent, the number of children living in the household, former income which is the basis for replacement benefits, the federal state responsible for the payment of replacement benefits, the amount of income earned by the parent during the leave, and, in case of mothers, maternity leave benefits received during the leave.<sup>2</sup> Moreover, it includes information on the amount of replacement benefits on a monthly basis.

Using this monthly information, we are able to infer in which specific months after childbirth a parent took leave. For each father we construct a vector containing all 14 months of paternity leave entitlement containing a value of one for months the father received replacement benefits and zero otherwise. In addition, using information on the date of birth of the child, we distinguish fathers by the calendar month their child was born.<sup>3</sup> This data exclusively forms the basis of our empirical analysis.

---

<sup>1</sup> An exception is single parents who are allowed to take up to 14 months of parental leave.

<sup>2</sup> A more detailed description of the data is given by the Federal Statistical Office (2014).

<sup>3</sup> Fathers are identified by the variable ef4 (sex) of the Elterngeldstatistik 2013. The amount of replacement benefits is taken from variables ef17u5 (for the first month after childbirth) to ef30u5 (for the fourteenth month after childbirth). The calendar month the child was born is obtained from variable ef11u2. A list of all variable names is available at [http://www.forschungsdatenzentrum.de/bestand/elterngeld/DSB\\_Elterngeld\\_KDFV\\_geborenekinder2013\\_neu.pdf](http://www.forschungsdatenzentrum.de/bestand/elterngeld/DSB_Elterngeld_KDFV_geborenekinder2013_neu.pdf)

### 3 Results

First of all, let us define  $\pi_t$  as the share of fathers taking parental leave in month  $t$ ,  $n_t$ , relative to the total number of 217,545 fathers,  $n$ , taking parental leave within the fourteen month period after childbirth:

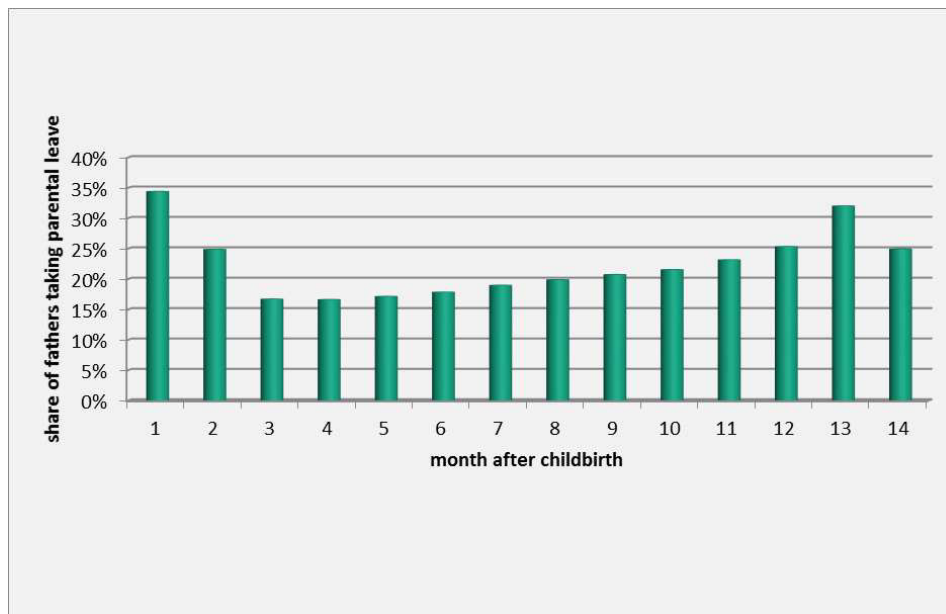
$$\pi_t = n_t / n \text{ with } t \in [1,14]. \quad (1)$$

Since fathers take on average more than one month of parental leave, it holds that  $\sum_t n_t > n$ .

A simple month wise analysis of this measure shows some remarkable results (compare Figure 1): First, with about 34.0 percent, this share is highest in the month directly following the birth of the child. With 24.6 percent in the second month after childbirth, it is still above the average share,  $\bar{\pi} = \sum_t \pi_t / 14$ , which is only 22.3 percent. What follows is a substantial

drop of  $\pi_t$  for  $t=3$  and a steady increase of the share afterwards till  $t=13$  where a local maximum is reached. For the last month of entitlement, the share of fathers taking parental leave declines again but is still above the average share depicted by  $\bar{\pi}$ . A possible explanation for the observed pattern is that a substantial fraction of fathers taking parental leave do so either directly after birth or following the (complete) use of their female partner. The latter may also explain the steady increase in fathers' usage between  $t=3$  and  $t=13$ , as these may be cases where the mother takes less than the maximum number of 12 months available for parental leave. In summary, our results show a strong divergence in the use of paternity leave throughout the months of entitlement, with a comparably high utilization right after childbirth and around the first birthday of the child.

Figure 1: Paternity leave share by age of child



Standard errors for all months are always lower than 0.11 percent and are therefore not reported here. Source: Research Data Centre of the Statistical Offices of the Federation and the German States, Elterngeldstatistik 2013, own calculations.

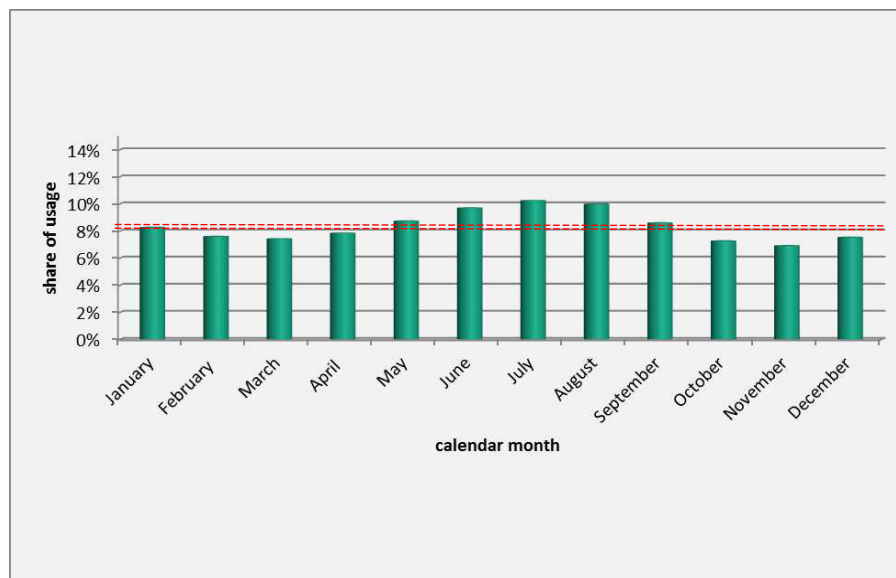
Apart from these effects related to the month of birth of the child, seasonal effects may also play a role for fathers' use of parental leave. To test this, in a first step, we use the information on the child's month of birth provided by the administrative data to convert months with entitlement for parental leave,  $t$ , into calendar months with entitlement,  $c$ , i.e. months January to December.<sup>4</sup> In a second step, we then compute the relative distribution of all months of parental leave taken by fathers in these months:

$$\pi_c = n_c / \sum_c n_c \text{ with } c \in [1,12] \text{ and } \sum_c \pi_c = 1. \quad (2)$$

If seasonal effects in the use of parental leave would be completely absent,  $\pi_c$  should be distributed discrete uniformly, i.e.  $\pi_1 = \pi_2 = \dots = \pi_{12} = 1/12 = 0.0833$ . Deviations from this discrete uniform distribution thus can be interpreted as fathers preferring to take parental leave in one or more specific months more than in others.

Figure 2 displays the relative distribution of fathers' usage between January and December. As can be seen, with 6.9 percent, the smallest share of parental leave can be found in November, while the highest share of months taken is 10.0 percent or higher in July and August. Both, the maximum and the minimum values are outside a 99 percent confidence interval for the mean share of 0.0833 expected without any seasonal effects, hence indicating the existence of seasonal effects.

Figure 2: Relative distribution of paternity leave



Dashed lines depict the lower (0.0825) and the higher bound (0.0842) of a 99 percent confidence interval for the mean under the null hypothesis of a discrete uniform distribution.

Source: Research Data Centre of the Statistical Offices of the Federation and the German States, Elterngeldstatistik 2013, own calculations.

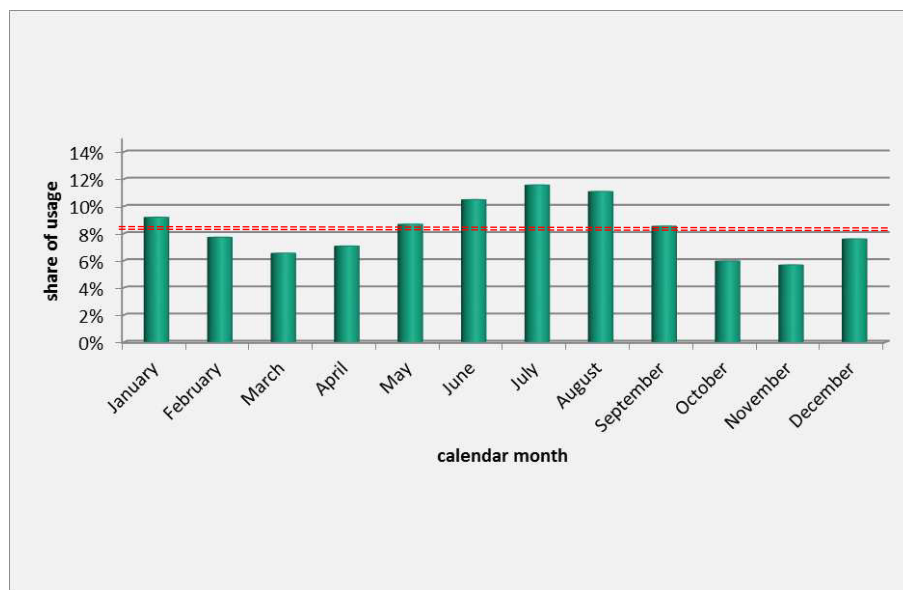
<sup>4</sup> To give an example: If paternity leave is taken in  $t = 2$ ,  $t = 3$  and  $t = 13$ , and the child was born in February, this implies paternity leave taken in  $c = 3$  (March),  $c = 4$  (April) and  $c = 2$  (February). If the child was instead born in March, it implies paternity leave taken in  $c = 4$  (April),  $c = 5$  (May) and  $c = 3$  (March).

Note that the results presented in Figure 2 do not correct for different numbers of births throughout the year. In fact, we observe an above average number of births during the summer. As a substantial share of fathers take parental leave either directly after childbirth or around the first birthday of the child (see Figure 1), and since these months are summer months for children born during the summer, this explains the seasonal effects to a certain extent.

On the other hand, it can be argued that seasonal effects do play almost no role for the choice to take leave right after childbirth or at the end of the period of entitlement. Instead, these months are taken either to relieve the mother after childbirth or to enable the mother's re-entry in the labor market and are thus *inflexible* with regard to seasonal effects. With respect to an analysis of seasonal effects, it seems appropriate therefore to concentrate on those months which can be chosen more *flexibly* by the father and to exclude all fathers taking parental leave in the more inflexible months  $t=1$ ,  $t=2$ ,  $t=13$ , or  $t=14$ . Thus, this exclusion does also (partly) correct for the effect described above.

For the modified sample with 62,708 remaining fathers, the effects are even more pronounced than before. As Figure 3 shows, the share of *flexible* months taken in October and November drops from 7.3 and 6.9 to 6.0 and 5.7 percent respectively. Similar effects occur for March and April. In contrast, the share of *flexible* months taken between June and August increases further, with a maximum value of 11.6 percent in July. Again, in all these calendar months, shares are significantly different from those of a discrete uniform distribution.

Figure 3: Relative distribution of paternity leave – flexible months only



Dashed lines depict the lower (0.0815) and the higher bound (0.0852) of a 99 percent confidence interval for the mean under the null hypothesis of a discrete uniform distribution.

Source: Research Data Centre of the Statistical Offices of the Federation and the German States, Elterngeldstatistik 2013, own calculations.

Finally, it may be worthwhile to analyze how seasonal effects differ with respect to the duration of parental leave taken by fathers. Based again on the whole sample including *flexible* and *inflexible* months, we therefore distinguish between three groups of fathers: Those who take less than four months of parental leave (group 1), those who take between four and

eight months (group 2), and those who take more than eight months (group 3). While the first group consists of 180,309 fathers, group 2 and 3 consist of only 19,263 and 17,973 fathers respectively.

For the latter group, the distribution of calendar months taken within the year should by definition be quite similar to uniformity, while less uniform distributions can be assumed for group 2 and group 1 if seasonal effects exist. As becomes obvious from Table 1, seasonal effects that follow the pattern already perceived above for the entire sample can indeed be observed for these two groups. A comparison with the undifferentiated shares from Figure 2 and between groups 1 to 3 reveals that seasonal effects are more pronounced among those fathers who take less than 4 months of paid leave. For example, with 10.7 to 11.7 percent, the shares of fathers in group 1 taking leave between June to August are substantially higher than those in group 2 (8.8 to 9.0 percent) as well as the pooled shares for all three groups as presented in Figure 2 (9.7 to 10.2 percent). Moreover, the number of months where shares are statistically significant different from the expected share under a discrete uniform distribution is smaller for groups 2 and 3.

c	Month	Paternity leave		
		Less than 4 months	4 to 8 months	More than 8 months
1	January	8.26	<b>8.10</b>	8.35
2	February	<b>7.02</b>	<b>8.06</b>	8.35
3	March	<b>6.68</b>	<b>8.06</b>	8.39
4	April	<b>7.35</b>	8.37	8.42
5	May	<b>8.96</b>	<b>8.58</b>	8.38
6	June	<b>10.68</b>	<b>8.84</b>	8.35
7	July	<b>11.68</b>	<b>8.97</b>	8.30
8	August	<b>11.23</b>	<b>8.91</b>	8.31
9	September	<b>8.79</b>	8.45	8.30
10	October	<b>6.46</b>	<b>7.99</b>	8.30
11	November	<b>5.87</b>	<b>7.84</b>	8.27
12	December	<b>7.02</b>	<b>7.82</b>	8.29
99 percent confidence interval	lower bound	8.22	8.12	8.18
	higher bound	8.45	8.55	8.49
Number of fathers		180,309	19,263	17,973

All values are in percent. Bold numbers depict values significantly different from 8.33.

Source: Research Data Centre of the Statistical Offices of the Federation and the German States, Elterngeldstatistik 2013, own calculations.

## 4 Conclusion

Using a large administrative data set, we show that there is a seasonal effect with regard to the use of paternity leave in Germany. Our analysis reveals that fathers are significantly more likely to take a leave in summer. This confirms previous results from Sweden by Ekberg et al. (2013) who find a similar pattern in the use of paternity leave for births at the turn of the year 1994/1995. By using information on all children born in 2013 for which parental leave was taken, we are able to show that this result holds independent of the month the child was born. Moreover, our data reveals that seasonal effects are more pronounced if the analysis is narrowed to those fathers who take only few months of paternity leave.

The scope of this analysis is limited as it only identifies seasonal effects among (subgroups of) fathers taking parental leave, but does not investigate the determinants of this behavior. Further research could try to predict which fathers are more likely to follow the observed pattern based on additional information on the individual level. This should probably include information on parental leave by the mother, as taking paternity leave may be seen as a joint decision of the two partners and not as the sole decision of the father. This would allow an analysis of the motives determining the observed behavior. At this point, we can only speculate about the reasons for the seasonal effects. Among others, one possible explanation is that thoughtful employees recognize the costs parental leave imposes on their employers and try to take parental leave in less busy times, such as those months in which most people go on holiday. Cherry picking by fathers with a comparable low willingness to participate in childcare and household work would be an alternative explanation. In the latter case, fathers would time their parental leave either as a prolongation or as a substitute for their regular leave.

Such an analysis is not possible with the administrative data set we use in our analysis, since information on characteristics irrelevant for the calculation of parental leave benefits, e.g., family background, parents' education and time use, etc., is limited. Further research should therefore try to find useful empirical data that allows a deeper analysis as proposed here.



## References

- Bruning, G. and Plantenga, J. (1999) "Parental leave and equal opportunities: Experiences in eight European Countries" *Journal of European Social Policy* **9**, 195-209.
- Duvander, A. (2014) "How long should parental leave be? Attitudes to gender equality, family, and work as determinants of woman's and men's parental leave in Sweden" *Journal of Family Issues* **35**, 909-926.
- Duvander, A., Lappegård, T. and G. Andersson (2010) "Family policy and fertility: fathers' and mothers' use of parental leave and continued childbearing in Norway and Sweden" *Journal of European Social Policy* **20**, 45-57.
- Ekberg, J., Eriksson, R., and G. Friebel (2013) "Parental leave — A policy evaluation of the Swedish "Daddy-Month" reform" *Journal of Public Economics* **97**, 131–143.
- Federal Statistical Office (2014) *Bundesstatistik zum Elterngeld*, Wiesbaden.
- Patnaik, A. (2015) "Reserving Time for Daddy: The Short and Long-Run Consequences of Fathers' Quotas" Working Paper.
- Wrohlich, K., Berger, E., Geyer, J., Haan, P., Sengül, D., Spieß, C., and A. Thiemann (2012) *Elterngeld Monitor*, DIW Berlin: Berlin.