

Changes in Family Income around the Time of Birth of Children in Germany between 1985 and 2004

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Abstract: While the course and the determinants of fertility behaviour have been investigated intensively, the monetary consequences of birth have hardly been considered empirically to date. Therefore, this paper focuses on the short-term (equivalent) household income changes around the time of births in a longitudinal perspective and examines them for their causes. For the analyses of the longitudinal data (GSOEP-Data 1984-2005), fixed effects panel regression models were computed. The results show that the short-term socioeconomic consequences of birth have clearly increased in the last two decades and first births in particular are associated with disproportionately severe socioeconomic consequences, while further births are rarely accompanied by negative changes in the households' socioeconomic situations. Furthermore, household income losses attributable to births only arise in double income households and increase gradually in line with a rising level of household income before birth. Hence, the analyses suggest the need for more adequate state assistance with respect to family support. Beside the provision of adequate infrastructural conditions which allow mothers to be employed, also the payments to compensate for child-related costs ("Kindergeld") should be – in contrast to the present practice in Germany – increased and re-adjusted with respect to the child's position in the birth sequence.

Keywords: children · household income · Germany · births · longitudinal · fixed-effect

1 Introduction

The birth of a child is connected with numerous processes that have a remarkable impact on the household's socioeconomic situation. One major effect is that households potentially suffer from losing an income (income effect). Also, additional expenditure is incurred due to the child's living costs (need effect). Hence, many studies based on cross-sectional data show with regard to the equivalent household

income (a measure that adjusts the disposable household income for a household's size and age composition) that families with children are disadvantaged in comparison to childless households (*U.S. Census Bureau 2006; Statistisches Bundesamt 2007*). In 2005, for example, two-parent households in Germany with one child had, on average, a 1,200 euros equivalent household income available per month, while for two-child families this decreased to 1,108 euros, and the figure for three-child families was only 994 euros (*Schulze 2009*). In contrast, the average monthly equivalent household income of a childless couple was 1,354 euros. Overall, cross-sectional data clearly shows that children are an important socioeconomic risk for the households in which they live, and especially families with several children run the risk of blundering into materially precarious situations (*Bäcker 2003*).

However, on the basis of cross-sectional data, comparing average household incomes of families with differing numbers of children is problematic if the respective income differences between the households are to serve as proof of 'costs' connected with children. Period data only considers the household income situations from *different* households at *one point sometime after* birth. This means that, firstly, families who are in different phases of the family cycle (i.e. families with children of different ages) are compared. Secondly, there is no information about the households' socioeconomic situations before the birth of children. However, without detailed information about the families' pre-birth socioeconomic situations, it is hardly possible to draw conclusions about socioeconomic effects of the births (*Kalwij 2005; Klein 1987*). Cross-sectional findings raise the question of whether the income differences after childbirth between households with a different number of children are directly caused by the differing number of children or whether the (poorer) families with more children were already in an economically worse position before the birth of the child (e.g. due to selection effects of fertility).¹ With cross-sectional data it is possible to depict the socioeconomic situations of households at one time. However, the causes of and reasons for the changes in household income over time and the income differences between different households cannot be established.

In order to avoid the above-mentioned methodological problems, this study focuses on household income processes in families in a longitudinal perspective. Hence, household income changes induced by birth can be directly determined (including all monetary inflows and deductions) by comparing the household's income one year before and one year after birth. The purpose of the present article is to identify the short-term socioeconomic risks following birth and to determine their extent in relation to (a) the child's position in the birth sequence, (b) the year of birth, (c) the parents' pre-birth occupational profiles and (d) the household's economic status before birth.

¹ International findings consistently suggest that women who are highly educated and/or are gainfully employed are less likely to have (further) children than other women (*Schröder/Brüderl 2008; Budig 2003*).

In order to answer the questions outlined above, firstly, the changes in German family state aid in the last few decades are emphasised (Section 2) and explanatory factors for socioeconomic consequences of births are discussed (Section 3). Further, the methods and statistical procedures applied are clarified (Section 4), and the results of the analyses are shown, presenting fixed effects panel regression models on the basis of the German Socio-Economic Panel 1984-2005 (Section 5). Finally, conclusions are drawn and discussed with respect to the consequences for German family policy (Section 6).

2 German family state aid in the last few decades

Given the low birth rates in Germany from an international perspective (*U.S. Census Bureau* 2004), and the relatively low employment rates of mothers (*Statistisches Bundesamt* 2005) as well as the relatively low economic positions of households with children (*Schulze* 2009), in Germany, all areas of family policy currently receive high political attention. While family state aid has been so far mainly focused on monetary compensation for the socioeconomic consequences of having children, new (infrastructural) measures of family policy have recently been introduced. These new measures are geared towards promoting equal rights between the sexes and improving the compatibility of occupation and family (e.g. extended coverage of crèches and kindergartens).

However, despite the well-known deficits in the infrastructure for successfully combining occupation and family in Germany, the monetary instruments of state aid still play a decisive role in family politics. Particularly for families with a newborn child, the monetary compensation for the socioeconomic consequences of fertility is of significance, since 90 % of all parents (mothers) wish to care for their child themselves in the first twelve months even if public childcare facilities for this age group exist (*Bien et al.* 2007). Therefore, an improvement in the infrastructural conditions allowing young mothers to remain gainfully employed during the first year after birth will only be of limited effect in terms of avoiding the *short-term* negative financial consequences of fertility. Thus, monetary benefits are of particular importance for compensating the short-term socioeconomic consequences of births, at least during the period immediately after birth.

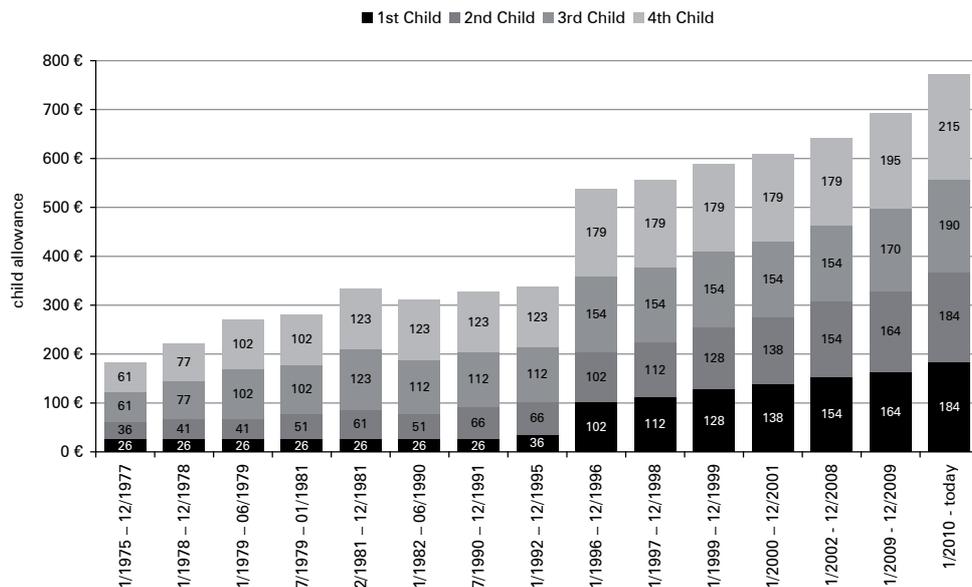
Since the following analyses exclusively examine the above-mentioned short-term consequences of fertility, only the relevant German family state aid will be considered here. This includes child allowance, child-raising allowance and the parental allowance that was introduced in 2007.

Child allowance ('Kindergeld'): Child allowance, the key instrument of German family state aid for compensating the living costs of a child, was paid for the first time in 1955 but only for third and further children. Later, also second children (1961) and finally first children (1975) were considered and now child allowance is paid for

each child.² The *amount* of child allowance depends solely on the number of the child in the birth order, i.e. the child benefit is a payment to households with children unrelated to age or income (*Hohnerlein* 2000). The current child allowance is 184 euros per month for the first and second child, increasing to 190 euros for the third child and 215 euros for the fourth and further children. Thus, the child allowance for the fourth child is now about three times as high as it was in 1975, and for the first child it is six times as high (see fig. 1).

Despite the disproportionately high increase in the child allowance payments for first children, a review of the development of child allowance over time highlights the fact that families with several children have always been in the centre of the political interest, i.e. the lowest amount for compensating the child's living costs was paid for first children. This disadvantage for first children has diminished now, but even today third children are still more highly 'subsidised' than second or first-born children. Since child allowance is paid explicitly as compensation for children's *individual* needs, this payment practice is implicitly based on the assumption that children's needs increase with the number of children in the birth order.

Fig. 1: The development of child allowance in Germany from 1975



Source: Composition of various volumes of the statistical paperback of the Federal Ministry of Labour and Social Affairs

² About 90 % of German households with children receive child allowance. The other 10 % make use of the advantages resulting from their high household incomes in the form of an alternative tax exemption for dependent children.

Child-raising allowance ('Erziehungsgeld'): In addition to child allowance, child-raising allowance was also paid to families with children who were born before 2007. Unlike child allowance, child-raising allowance was an income-dependent family benefit. Anyone who is not full-time employed, i.e. not employed for more than 30 hours per week, and whose household income is below defined income limits³ (e.g. € 30,000 per annum for couples and € 23,000 per annum for single parents with one child) could receive child-raising allowance. The entitlement period for receiving child-raising allowance was extended over time from ten months originally to 24 months subsequently. However, the amount of child-raising allowance (300 euros per month for a period of 24 months) and the household income limits were not raised after the allowance was introduced. However, as of 2001, it was possible to receive child-raising allowance for twelve months only, but with increased monthly payments amounting to a maximum of 450 euros.

Parental allowance ('Elterngeld'): In 2007, parental allowance replaced child-raising allowance, with the objective of compensating income losses resulting from a temporary interruption of employment better than the relatively low payments of the child-raising allowance. The parental allowance amounts to 67 % of the net earnings of the parent applying to receive this benefit, averaged over twelve months before the child's birth, up to a maximum of 1,800 euros per month. A minimum amount of 300 euros (basic rate of the pre-existing child-raising allowance) is granted independently of previous gainful employment. If both parents are employed before birth, the designated partner who is caring for the child can receive parental allowance for a period of up to twelve months. Two further months are added if the other parent also reduces her/his hours of work to less than 30 hours per week for two months. German politicians have adopted a clause derived from the Scandinavian system which allows both parents to exercise their right to take time off with their newborn child. Thus, parental allowance compensates the short-term monetary consequences of birth better than the previously paid child-raising allowance and, moreover, for the first time, high-income households explicitly benefit from family state aid to a considerable extent (*Deutsches Institut für Wirtschaftsforschung* 2006).

3 Specification of hypotheses

A positive or negative change in household income over time may be due to many factors (*Berntsen* 1989). However, the majority of these can be categorised into four types: a changed participation in the labour market (e.g. due to retirement); a changed level of earned income (e.g. due to further training); changed payments of social benefits (e.g. due to unemployment) and a changed household size (e.g. due

³ If the household income of the first six months after childbirth was above the income limits, there was no entitlement to child-raising allowance. Starting from the seventh month, the child-raising allowance was gradually reduced if the household income was above the income limits.

to divorce), which makes it necessary to reallocate existing monetary resources within the household.

Obviously, a birth is relevant with respect to all of these situations. First, children have a considerable effect on parents' (mainly women's) capacity to be employed (*Schröder/Brüderl* 2008; *Kenjoh* 2005). Second, there is ample research documenting that mothers experience a wage penalty due to the birth of a child, since a birth-related temporary interruption of employment is frequently associated with subsequent lower incomes after returning to work (*Kunze/Ejrnaes* 2004; *Budig/England* 2001). Conversely, fathers receive a family premium since the birth of a child is associated, on average, with an increase in men's time spent at work and an increase in men's hourly wages (*Kaufman/Uhlenberg* 2000). Third, with the birth of a child, households become eligible for family benefits (e.g. child allowance and child-raising allowance). And fourth, birth implies an increase in the household size and thus an increase in the household's needs. Accordingly, the socioeconomic consequences of childbirth are connected with (a) a changed level and composition of the disposable household income (re-allocation of altered incomes to the household) and (b) the child's costs of living (new distribution of total income within the household). The important question is which family characteristics are associated with the above-mentioned factors.

Pre-birth occupational status: It is a well-known fact that the time requirements of parenthood are one of the most important aspects of the monetary consequences of birth. Neoclassical theories of fertility in particular (*Becker* 1981) stress that childcare and employment both demand significant amounts of time and therefore both areas of life compete strongly for one parent's time. Hence, the opportunity costs of fertility result from the potential earned income forgone due to the parent's (usually the mother's) time spent on childcare. In Germany there are few possibilities (in particular for parents of infants younger than one year) to externalise the opportunity costs of time used for childcare (e.g. by making use of public childcare facilities) and/or most mothers do not want external childcare for their baby within the first twelve months after birth (*Bien et al.* 2007). Therefore, short-term income losses from at least a temporary interruption of gainful employment are difficult to avoid.

However, neoclassical economic theories do not account for the fact that the compatibility of occupation and family is not an individual but a household problem, as birth decisions are made within a relationship. Employment-related income losses following birth are therefore not the result of an individual time conflict (mostly the mother's) but rather the result of a time conflict at household level (*Ott* 1989). Such a household-related time conflict exists, however, only if *both* parents were gainfully employed before birth. Thus, if at least one parent was unemployed before the birth of a child, there are *no* household-related opportunity costs of childcare at *household-level*, since the employed partner does not have to give up her/his occupation in favour of childcare. In other words, if at least one parent lacks a regular earned income before birth, the household will not have to dispense an income *due to* birth. Therefore, it can be hypothesised:

(H1) Negative effects of a child's birth on the household income are limited to families where both parents were employed before birth (because otherwise there would be no household-related time conflict between occupation and childcare).

Calendar year of birth: Considering the parents' pre-birth occupational status, it must also be borne in mind that as a consequence of the modernisation of society (as a result of improved educational opportunities, for example) nowadays both partners are more frequently gainfully employed before the birth of their child. In addition, today women have, on average, higher incomes due to higher levels of education. Both factors cause increasing household-related opportunity costs over time and thus lead to (on average) higher financial burdens resulting from the birth of a child. Furthermore, in the course of the modernisation of society, there has been a considerable increase in mothers' ages when they give birth (*Engstler/Menning 2003; Kreyenfeld 2002*). This delay of births has followed from both women spending more years in education and a longer phase of gainful employment. This age effect has also increased the opportunity costs of birth over time due to income-relevant seniority effects (e.g. work experience).

Furthermore, the above-mentioned increase in income risks related to birth was not adequately compensated by German family state aid since the monetary benefits for families (child-allowance and child-raising allowance) and the infrastructure for successfully combining occupation and childcare were not adequately adjusted to the changed conditions of fertility in the last few decades. All in all, the mentioned cohort and age effects would cumulate in different income losses due to birth across the calendar years of birth.

(H2) The loss of household income attributable to birth increases with the calendar year of birth (this is, firstly, due to an increase of household-related opportunity costs over time resulting from women's higher level of education and their increased age when giving birth; and, secondly, family state aid was not adequately adapted to the changed conditions of fertility in the last few decades).

Number of the child in the birth sequence: In addition to the relations addressed so far, a further topic is the link between the monetary consequences of a birth with the child's number in the birth order. Two factors are of interest here: firstly, the different needs of first, second and third children, and, secondly, the different pre-birth occupational profiles of parents with a different number of children living in the household before another birth.

Theoretical arguments concerning the division of household labour (*Becker 1981*) serve as a basis for the second area of focus. According to *Becker*, childless couples frequently have not made a final decision about the division of household labour and both partners are gainfully employed before the first birth. However, starting with the first birth, a bargaining process on the division of labour takes place between the partners, enforced by the *household-related* time conflict between occupation and childcare (*Ott 1989*). As a result of the bargaining process, a relatively stable division of labour between the partners is established (*Schulz/*

Blossfeld 2006), i.e. one partner (mainly the father) is gainfully employed after the first birth, whilst the other partner (usually the mother) cares for the children (male-breadwinner model). This transformation from a dual- to a single-earner household induced by the first birth leads to considerably lower household-related opportunity costs of second and further births, since one partner is already economically inactive before these births initiated by the first birth. This is mainly due to the (empirically proven) fact that parents who wish to have more than one child normally plan to have their children in short succession (*Birg et al.* 1990; *Kreyenfeld* 2002) to fit the birth of second and further children into the phase of one partner's unemployment initiated by the first child (*Schmitt* 2007). Accordingly, first children in particular are associated with occupational restrictions and thus birth-related income losses (*Schulz/Blossfeld* 2006), whereas the household-related opportunity costs of birth are decreased with further children.

Moreover, the number of the child in the birth sequence is also of importance with respect to the child's costs of living. It is widely accepted that first children cause higher direct costs than second and subsequent children. This assumption is based on the microeconomic household theory which states that there are savings associated with each further household member (*Klein* 1987). The direct costs for the first child are higher because the birth of second and further children causes cost advantages resulting from the distribution of fixed costs (*Economies of Scale*), e.g. costs of electricity and heating. Besides, there are also savings from the further use by younger brothers and sisters of furniture, clothes and toys which had already been purchased for the first child. Thus, the extra costs of living for children decrease as the number of the child in the birth sequence rises.

Finally, it also has to be taken into consideration that, in Germany, some family benefits are paid based on the child's place in the birth sequence. As described above (see section 2), child allowance ('Kindergeld') increases in line with the number of the child in the birth order. Thus, the needs of a child are compensated better the later the child is in the birth sequence.

(H3) Socioeconomic consequences of birth decrease with a higher number of the child in the birth sequence (because of decreasing household-related opportunity costs with each child, a decline of direct costs in line with the number of the child in the birth sequence and partly higher state benefits for further children).

Pre-birth socioeconomic status: As well as the factors already discussed, the economic consequences of birth also depend on the household income before birth. It may usually be assumed that the higher the pre-birth household income, the higher the income losses, since there is more money to lose. However, it is also plausible that the relation between pre-birth household income levels and the income consequences of childbirths may not be linear, but inversely u-shaped, i.e. the loss of household income is first increased with high pre-child household income, but then decreases in the highest income groups.

The starting point for such an argument is the fact that as mentioned above, low-income households rarely have household-related opportunity costs at all,

since at least one parent is frequently not employed before the birth and, thus, can take over the childcare after the birth. Additionally, potential income losses in low-income households may be absorbed by public aid benefits from the welfare state that guarantee a certain minimum income, which lifts up poor families to their previous (low) socioeconomic level. Conversely, in middle-income households the incomes are too high to be eligible for such social benefits, and, both parents are more frequently employed, meaning that opportunity costs must be accepted. In principle, this is true for high-income households. However, they have a greater chance of externalising the potential wage losses since their relative costs of using external childcare options are lower compared to middle-income households. The latter argument follows a thesis by *Leibenstein* (1974: 467), stating that opportunity costs do not result from (the mother's) lost wages but rather from relative costs of childcare services during the mother's (continued) employment (*Leibenstein* 1974). In this respect, the possibility of externalising the potential wage losses (opportunity costs of fertility) is considerably increased in line with the pre-birth household income since the relative costs of external childcare, for example, employing a babysitter, are lower the higher the household income is. This means, before a high-income employment is given up, a specific proportion of the pre-birth earnings are used to free up time resources for the parents' (continued) employment by purchasing childcare assistance (*Huinink/Konietzka* 2007). Thus, the possibility of avoiding employment-related income losses is highest in high-income households. All in all, this can be summarised as follows:

(H4) The socioeconomic consequences of births are highest in middle-income households (because unlike low-income households they have higher opportunity costs and unlike high-income households they have higher relative costs of externalising the opportunity costs).

4 Data and methods

Most of the knowledge on the monetary consequences of childbirth is based on cross-sectional analyses which depict the post-birth socioeconomic situations of households with a different number of children in comparison to the socioeconomic situations of households that did not experience a birth. However, since some women and men are systematically less likely to have children than others (*Schröder/Brüderl* 2008; *Budig* 2003), such *ex-post comparisons* raise the problem that potential selection effects of fertility cannot be taken into account. For example, the unfavourable socioeconomic situation of families with many children compared to childless couples, measured with cross-sectional data, might not be caused by a birth but probably by the fact that couples, who have a large number of children, may have already been in a precarious situation before birth. In order to avoid this selection bias, it is necessary to control for household income levels before the birth in order to estimate the *causal* birth effect. Therefore, this study focuses on a *before-after* design. The analyses focus on household income processes in families

in a longitudinal perspective to determine the short-term economic consequences of a birth (up to about twelve months after the birth event).

All analyses are based on the German Socio-Economic Panel 1984-2005, an annual longitudinal household survey of the non-institutionalised population living in Germany (Wagner *et al.* 2007). The focus is exclusively on two-parent households. Single-parent households are not analysed (due to a small number of cases) although economic consequences of birth are a particular problem in such households.

Since the following calculations compare the household incomes of the year before the birth of a child with those of the year after the birth,⁴ the population examined is limited to households in which at least one birth took place between 1985 and 2004. Furthermore, to allow the income and need effects of births to be clearly identified, the households considered were only those in which the household size changed between the year before and after birth solely due to the birth event itself (e.g. an increase from two to three persons due to the birth of the first child in a couple household). Neither households in which more than one child was born (twin births) nor households in which sequential births followed each other at annual intervals were included in the analyses. Within the limits imposed by these restrictions, 2,225 births (890 births of first children, 982 of second and 353 of third children) were identified, for which household income data was available for the year before and after birth.

A central variable in determining births' socioeconomic consequences is the monthly *disposable* household income. A separate calculation of the disposable household income resulting from the single net incomes of the household members was not necessary, since respondents were asked directly to state their monthly household income: "If you take a look at the total income from all members of the household: how high is the monthly household income today? Please include regular income such as pensions, child allowance, etc." These household incomes were adjusted for inflation in line with the price index of the Federal Statistical Office of Germany (Statistisches Bundesamt 2006).

Subsequently, the monthly *equivalent* household income was calculated as a function of the household disposable income divided by the sum of the individual need weights of the persons living in the household, whereas the need weights depend on the selected equivalence scale. The weights of the selected *equivalence scale* reflect certain assumptions about the household members' age-specific needs and about savings resulting from cost advantages of households with a large number of persons due to the distribution of fixed costs (economies of scale). The choice of a specific equivalence scale, however, has been a matter of a consider-

⁴ Therefore, births which took place at the time of the interviews between 1985 and 2004 are standardised on the event time T , irrespective of the actual year of birth. Checking for possible period effects is nevertheless easy to do by controlling for the year of birth.

able debate, and a wide variety of scales have been advocated.⁵ The basis taken for computing the equivalent household income in this study is the *modified OECD scale*, which evaluates the first adult with a factor of 1.0, further persons from 15 years upwards with a factor of 0.5, and children under 15 years with a value of 0.3 (OECD 2005).

Both the disposable household income and the equivalence income are used as dependent variables. Both dependent variables were logarithmised in order to make the interpretation of relative income changes possible, besides the well-known methodological advantages. Additionally, calendar year dummies were included into the models to control for period effects.

Several household characteristics are taken into account in order to determine the socioeconomic consequences of birth. Information about the child's position in the birth sequence (first to third birth) can be directly derived from the variables available in the GSOEP. By considering the year of birth, (a) the parents' pre-birth occupational status (either both parents are employed or only one parent is employed or both parents are unemployed/economically inactive) and (b) the parents' pre-birth working hours (either part-time or full-time) are derived. Those who work at least one hour per week are considered to be gainfully employed (ILO definition). Part-time employment is considered to be no more than 30 hours of occupational activity per week. In order to analyse the relation between the level of the pre-birth household income and the income consequences following a birth, the household's affiliation to an income quartile based on the disposable household incomes before birth are calculated.⁶

For the analyses of the longitudinal data, fixed effects panel regression models (FE models) were computed (Wooldridge 2006; Halaby 2004; Allison 1994), since the use of standard regression models (e.g. pooled OLS) usually results in biased regression estimates due to an endogeneity bias (i.e. the independent variables and the error term are correlated). A standard regression model would have calculated the effects of births on household income correctly only if there was *no heterogeneity* of the relevant characteristics in an (a) intra-personal and (b) inter-individual perspective. Since neither of the mechanisms mentioned above can be appropriately controlled in standard models, at least regarding unobserved heterogeneity, the results are systematically biased (Heckman/Hotz 1989). With an FE model these

⁵ The choice of a specific equivalence scale is crucial since the extent of the different estimated individual needs of the different scales has a significant impact on the results derived, i.e. depending on the chosen equivalence scale, very different equivalent household incomes may result (Cowell/Mercader-Prats 1999). For example, the modified OECD equivalence scale usually applied at European level implies a stronger accent on poverty in single-person households, while the use of the higher need weights of the 'old' OECD scale places more emphasis on the poverty in families with a large number of children (Hauser 2002: 258).

⁶ The quartile-values are: $Q_{.25}$ =1,022 euros in 1985 and $Q_{.25}$ =1,553 euros in 2004; $Q_{.50}$ =1,329 euros in 1985 and $Q_{.50}$ =2,350 euros in 2004; $Q_{.75}$ =1,789 euros in 1985 and $Q_{.75}$ =3,400 euros in 2004.

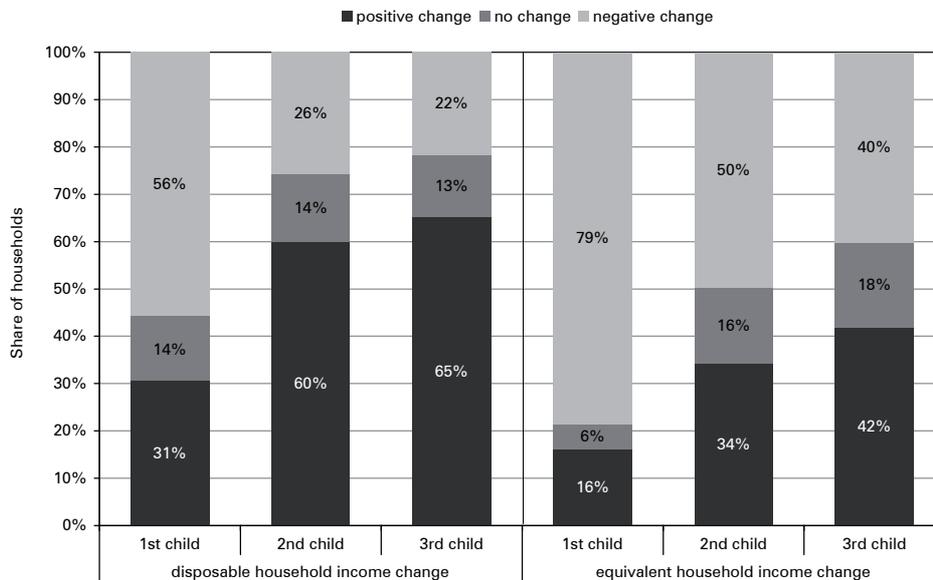
problems are solved to a considerable extent, since time-constant independent factors are excluded from the statistical model. Thus, time-constant heterogeneity is no longer a problem. Admittedly, the problem arises that effects of time-constant covariates cannot be directly estimated with FE regressions. Differences in the economic consequences of births concerning time-constant variables may only be revealed by computing different models for subgroups of the sample, e.g. separate models for each household income quartile (for details, see *Wooldridge 2006; Halaby 2004; Allison 1994*).

Results of an alternative possible random-effects regression model (RE model), which allows us to directly estimate the effects of time constant characteristics, are not reported since the *Hausman* test (see *Hausman 1978*) suggested that the results of the RE model are biased. The statistics from the test show highly significant differences between the FE and RE estimators, indicating that the FE model is appropriate. The software package SAS.V8.1 was used for all the analyses.

5 Results

Prefacing the main results of the FE models, figure 2 provides information about the families whose socioeconomic situation worsened or improved between the year before and the year after the birth event. In terms of the *disposable household incomes*, it becomes clear that about 56 % of the households' situations deteriorated

Fig. 2: Birth-related changes in the household's socio-economic situation in relation to the child's position in the birth order



Source: *SOEP* (1984-2005), own calculations

after the birth of the first child, whereas this happened to only about every fourth household following the second or third birth (26 and 22 % respectively). Thus, while losses result from initially starting a family (i.e. the birth of the first child), many households face no household income losses, or even see income increases during the phase of family extension (i.e. the birth of second and third children). For example, the disposable household income in 60 % of the families with second or third births is higher one year after the birth than it was in the year before these births.

In contrast to the changes in the disposable household income, the changes in the *equivalent household income* show that much more families experience losses from births (due to the additional needs of each newborn child and the associated re-distribution of the disposable household income after birth). Accordingly, more households are affected by a reduction of their equivalent household incomes: About 79 % of the households experienced a financial cut following the first birth, 50 % as a result of the second birth, and 40 % of the households following the third birth.

Despite the evidence that many families suffer negative equivalent income changes with the birth of a child, figure 2 also shows that, with a rising number of children, some families actually improved their equivalent incomes with the birth of a child. Thus, for 16 % of households with the first birth, 34 % with the second birth and 42 % with the third birth, not only did the disposable household income improve but also the equivalent income. Therefore, not every birth – as is frequently implicitly assumed – is connected with a deterioration of the household's socio-economic situation. According to the data, it cannot even be assumed that negative consequences of the birth of a child are the dominant pattern. This raises the question of what the determinants of an improved or decreased socioeconomic situation attributable to birth are.

Table 1 shows, as an initial result of the multivariate analyses, the average effect of a birth on the household's socioeconomic situation in relation to the child's position in the birth order. The left-hand side of the table shows the relative effects of a birth on the disposable household income $\log(Y)$, while the right-hand side indicates the relative effects on the equivalent household income $\log(y)$. It can be seen that first births are connected with, on average, a loss in *disposable household income* of 6.6 %. Conversely, second births are accompanied by *increases* in the disposable household incomes of 8.8 %, and third births by increases of 10.8 %. Considering the children's need effects (i.e. the equivalent household income), first births, on average, lead to losses of 25.1 %, second births to losses of 6.5 % and third births to losses of 2.7 %. (The relatively small negative change connected with third births does not reach a level of statistical significance). This shows that considerable negative socioeconomic consequences result mainly from the family's formation (i.e. from the birth of the first child), while further births are accompanied only by moderate to marginal negative or even by positive socioeconomic conse-

Tab. 1: Determinants of relative income changes following a birth (Fixed-Effects models)

	Log disposable household income (Y)		Log equivalent household income (y)					
	Overall ¹⁾							
1st child		-0.066***		-0.251***				
2nd child		0.088***		-0.065***				
3rd child		0.108***		-0.027				
N		4450		4450				
R ²		0.157		0.138				
	Calendar year of the birth event							
	1985-89	1990-94	1995-99	2000-04	1985-89	1990-94	1995-99	2000-04
1st child	-0.029	-0.044	-0.071*	-0.148***	-0.197***	-0.228***	-0.253***	-0.329***
2nd child	0.131***	0.102**	0.103***	-0.010	0.010	-0.052	-0.050+	-0.163***
3rd child	0.145***	0.086+	0.102*	0.058	0.046	-0.051	-0.034	-0.083*
N ²⁾	870	1032	1182	1366	870	1032	1182	1366
R ²	0.146	0.206	0.155	0.145	0.126	0.180	0.135	0.132
	Household income level before the birth event ^{1),2)}							
	1. quartile	2. quartile	3. quartile	4. quartile	1. quartile	2. quartile	3. quartile	4. quartile
1st child	0.289***	-0.058***	-0.148***	-0.241***	0.103***	-0.242***	-0.332***	-0.425***
2nd child	0.279***	0.084***	0.026	-0.148***	0.127***	-0.069***	-0.127***	-0.299***
3rd child	0.241***	0.107***	0.046+	-	0.110***	-0.031	-0.090***	-
N	936	1446	1284	784	936	1446	1284	784
R ²	0.252	0.361	0.330	0.198	0.270	0.294	0.220	0.164
	Number of parents in employment before the birth event ¹⁾							
	none	one	both ^{a)}	both ^{b)}	none	one	both ^{a)}	both ^{b)}
1st child	0.218*	0.155***	-0.030	-0.155***	0.049	-0.033	-0.212***	-0.339***
2nd child	0.342***	0.147***	-0.022	-0.113***	0.201	-0.007	-0.174***	-0.262***
3rd child	0.239*	0.137***	-0.012	-	0.122	-0.003	-0.159***	-
N	176	2000	616	1332	176	2000	616	1332
R ²	0.179	0.152	0.124	0.152	0.194	0.164	0.118	0.119

***p<0.001; **p<0.01; *p<0.05; +p<0.1

1) Checked for the calendar year of the birth.

2) The quartile lies at: $Q_{.25}=1,022$ euros in 1985 and $Q_{.25}=1,553$ euros in 2004; $Q_{.50}=1,329$ euros in 1985 and $Q_{.50}=2,350$ euros in 2004; $Q_{.75}=1,789$ euros in 1985 and $Q_{.75}=3,400$ euros in 2004.

a) One parent is employed full-time and one part-time.

b) Both parents are employed full-time.

Source: *GSOEP* (1984-2005)

quences.⁷ Thus, the results support the hypothesis that the negative socioeconomic consequences resulting from birth decrease in line with the child's position in the birth order.

Regarding the disposable household income and the calendar year of birth, the results in Table 1 indicate that the income consequences of the birth of a child have clearly increased over the last two decades. Between the years of 1985 and 1989, for example, the birth of the first child was connected with a non-significant income decrease of -2.9 %, while first births between 2000 and 2004 were linked with a significant income loss of -14.8 %. This means that the financial consequences of first births in 2004 were almost five times as high as fifteen to twenty years earlier (potentially as a result of women's increasing educational and occupational participation, women's increased age when giving birth and/or the *relative* stagnation of the monetary state aid). A corresponding picture is also observable in terms of the equivalent household income changes following a birth. For example, while second and third births, on average, had no negative consequences for households at the end of the 1980s, corresponding births between 2000 and 2004 reduced the equivalence incomes by -16.3 % (for second births) and by -8.3 % (for third births). In a similar way, the already high income losses of -19.7 % brought about by the birth of the first child in the period 1985-1989 increased to -32.9 % in the period 2000-2004.

Another hypothesis of this paper focuses on the dependence of the socioeconomic consequences of the birth of a child on the households' pre-birth income levels. In this respect, the results show that negative financial consequences increase in line with the level of household income reached before a birth event (based on the affiliation to income quartiles). In the lowest (first) income quartile, for example, the birth of the first child implies an average disposable household income increase of 28.9 %. Hence, low-income households benefit from childbirths. In contrast, in households belonging to the second income quartile, the birth of the first child causes a disposable household income loss of -5.8 %. In households belonging to the third quartile, this loss amounts to -14.8 %, and in the fourth income quartile, first births lead to a loss of -24.1 %. Changes in the equivalent household income show similar patterns. The figure referring to the economic consequences of first births in the fourth income quartile is particularly remarkable. Households belonging to the highest income quartile before the birth of the first child lost, on average, -42.5 % of their equivalent household income due to the birth.

⁷ Since the employment patterns of women differ considerably between East and West Germany, the socioeconomic consequences of births were also calculated separately for each region. The respective (non-documented) results revealed that disposable and equivalent household income losses following birth clearly increased in eastern Germany. For example, first births are connected with, on average, a loss in disposable household incomes of 16.4 % in eastern Germany, compared to 5.5 % in western Germany. The figures for second (and third) births are -9.6 % (+1.0 %) in eastern Germany and +9.8 % (+10.9 %) in western Germany.

Finally, the results in Table 1 indicate that negative household income changes occurred only in two-parent households where both parents were employed before birth. If one parent was employed full-time and the other parent part-time, the income losses amounted to 3.0 % for the first birth, 2.2 % for the second and 1.2 % for the third birth. If both parents were employed full-time, the income losses clearly increased to approximately 10 % with every birth. If only one parent was employed before birth, disposable household incomes increased: In households with only one employed parent, we see a rise of about 15.5 % at the first birth, 14.7 % at the second birth and 13.7 % at the third birth. If both parents were not employed before birth, the income increases were even higher.

6 Concluding remarks

The purpose of this study was to clarify the impact of birth events on the socio-economic status of German two-parent families one year after birth. Changes in the disposable and equivalent household income around childbirths in relation to the children's position in the birth sequence, the parents' pre-birth occupational profiles, the household income positions before birth and the year of birth were of particular interest. To this end, longitudinal data of the GSOEP 1984-2005 was analysed by estimating fixed effects panel regression models. Thus, the results obtained are, in contrast to the findings of cross-sectional studies to date, in fact attributable to the birth events. Nevertheless, it is to be noted that the findings might be biased on the one hand, for parents choosing to have a child because they expect an income increase in the near future, which only appears in the estimates postpartum and on the other hand, for parents which forego job opportunities within twelve months before birth due to the projected childbirth.

The results presented here, firstly, have shown that a household's loss in disposable and equivalent income related to the childbirth is inversely proportional to the child's number in the birth order. This means that couples suffer the greatest economic losses as a result of starting a family, not as a result of adding to it. In addition to the effects of the children's position in the birth sequence, the paper has focused on the couples' employment status before birth and related effects on subsequent earnings up to one year after the birth event. The respective analysis shows that losses in the disposable household incomes only occurred where *both* parents had been employed before birth. Where only one or neither of the parents had been employed in the year preceding the birth event, the household income in the year following the birth was higher than before. These findings suggest that the current conditions are economically most beneficial for households that had a traditional division of labour before the birth event (male breadwinner households). In cases where both parents were employed beforehand, a situation seen almost exclusively before the birth of the first child, state-granted supplements were not sufficient to compensate for the short-term losses induced by one parent's temporary interruption of gainful employment.

The third focus of the article was the issue of differences in birth-related socio-economic consequences depending on the households' pre-birth income levels. The analyses presented have shown that household income losses due to birth dramatically increased in line with the level of the pre-birth household income. While birth-related income increases were seen in the lowest income group, households in the upper income classes suffered income losses, some losing over 40 % of their equivalent household incomes.

Furthermore, the results indicate that the negative household income consequences of fertility have grown with the year of birth, and that today, they are almost five times as high as at the end of the 1980s. This result highlights the fact that the state payments to families have not been sufficiently adapted to the changed conditions of fertility (e.g. to the increased participation of women in the labour market and the increased age of mothers when they give birth).

The analyses, seen as a whole, suggest the need for more specific state aid in family support, as the reduction of income inequalities between childless households and families is a priority objective of German family policy. Additionally, the proven financial effects of starting a family also draw attention to the obstacles that currently still deter a considerable number of potential parents. According to the results presented, the German family policy should be more focused on the barriers to starting a family.⁸ Therefore, beside the further improvement of adequate infrastructural conditions which allow mothers to be employed, also the payments aiming at compensating for child-related costs ('child allowance') should be adjusted. In contrast to the present practice, they should be *asymmetrically* distributed, i.e. higher child benefit payments should be paid for the first children than for second and further children.

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⁸ It is a well-known fact that the overall fertility rate in Germany has clearly decreased over the last few decades. However, this is mainly due to an increase in the number of childless women and not to a lack in mothers' willingness to extend their family. Respective studies show that the average number of children of mothers, i.e. of women who have borne at least one child, has remained relatively constant over time (*Kaufmann* 2005). In contrast, the number of childless women has almost doubled over the last 40 years (*Klein* 2003).

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