Is the receipt of social assistance transmitted from parents to children? Evidence from German panel data

Thomas Siedler*

Institute for Social and Economic Research, University of Essex
Colchester, United Kingdom CO4 3SQ
and
The German-Socio Economic Panel Study (SOEP),
DIW Berlin, Germany

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Abstract:

This paper investigates the extent to which the duration and the receipt of social assistance (SA) are linked between parents and children in Germany. Several related questions are addressed. Does parents' SA duration increase the future welfare dependency of children? Given exposure of welfare at home, are daughters more likely to live on SA later on than sons? Are there any differences in the probability of welfare dependency among young adults from the former East and West Germany? The analysis is based on alternative estimation procedures (probit and tobit, instrumental variable and non-parametric estimations) using data from the first nineteen years of the German Socio-Economic Panel Study. The estimates suggest that parental welfare receipt during late childhood years (ages 13-16) increases the probability and the expected duration that children receive SA in later life. Using various geographical differences in SA rates in Germany (between East-West Germany, northern-southern federal states and urban-rural areas) provide unique instruments to identify a causal link in intergenerational welfare receipt. No empirical evidence is found that the correlation in SA participation between parents and their adult children is spurious.

JEL classification: J62, I38, J13
Key words: welfare dependency, intergenerational links, instrumental variable

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1. Introduction

By the end of 2002, nearly 2.8 million people (3.3% of the population) were receiving social assistance (SA) in Germany. Social assistance is a means-tested public income support system, which provides a safety net for persons with low income, with the aim of maintaining a minimum standard of living. Eligible are all registered residents (Germans and foreigners) whose income is below a social minimum.[1] Since the introduction of the SA program in 1962, the social assistance rate has increased considerably over the decades (see Figure 1 in Appendix A). In particular, recent years have witnessed a surge of single mothers living on SA , with one in four receiving social benefit payments. Children also make up a large recipient group, with 6.6 percent of all children aged 18 and younger living on SA benefit in 2002, compared with 2.1 percent in 1980 (Statistisches Bundesamt, 2003).[2]

In the light of the increasing number of SA recipients, accompanied with growing costs of Germany's social assistance program in recent years, this research addresses several related questions. Does parents' receipt of SA increase the future welfare dependency[3] of their children? Does welfare exposure during childhood increase the expected duration of social assistance of young adults? Given parental welfare receipt, are daughters more likely to live on SA in later life than sons? Is there any difference of SA dependency and expected welfare duration among young adults from the former east and west Germanies?

This study contributes and extends the existing literature in several ways. First, the US literature typically examines the effect of living in a family that receives Aid to Families with Dependent Children (AFDC) on children's later life outcomes. [4] AFDC is a welfare program mainly targeted towards single mothers. Thus, these studies present empirical evidence for a sub-group of the population only. Not much is known to date about the intergenerational welfare dependency for children from intact families. SA receipt in Germany depends on household income and not on family structure per se[5],

[1] For more information about the German social assistance program see Appendix A and Adema *et al*. (2003). Since November 1993, asylum seekers are excluded from the SA program.
[2] Figures are calculated by the Federal Statistical Office Germany (Statistisches Bundesamt) based on the population as at 31.12.2001. See Statistisches Bundesamt, 2003.
[3] The terms "welfare dependency" and "social assistance dependency" are used as interchangeably throughout the paper.
[4] See Moffit, 1983; Duncan et al., 1988; McLanahan, 1988; Elwood, 1989; Butler, 1990; Antel, 1992; An *et al*., 1993; Gottschalk, 1990; Levine and Zimmerman, 1996, 2000; Pepper, 2000.
[5] Note, however, that the demographic composition of the household is key to the eligibility and the amount of potential SA benefit.

allowing me to disentangle between the effects of welfare exposure and family structure during childhood years on later life outcomes. Second, existing studies mostly present estimates of parental welfare receipt on daughter's outcomes as young adults (Antel, 1992; Gottschalk, 1990, 1996; Pepper, 2000). However, intergenerational welfare dependency might vary by gender. The present estimates for Germany suggest considerable differences in the intergenerational correlation of SA receipt between daughters and sons. Third, using the information whether young adults spend their late childhood years in East Germany during the 1990s, a geographical region characterized by skyrocketing unemployment rates and a relative low proportion of people receiving SA, provides a unique and strong instrument helping to identify intergenerational welfare transmission in Germany. Table 2 shows that the proportion of SA recipients in East Germany is considerably lower than in West Germany.[6] Differences between the proportion of SA recipients in northern and southern federal states as well as between rural and urban areas provide further IV candidates for parental SA receipt during late childhood years. Fourth, in the light of Gottschalk (1990), this study compares the outcomes of children whose parents' received SA with adult children whose parent(s) were poor, but did not claim and take up this means-tested benefit. Furthermore, by providing empirical evidence for a country other than the US, characterized by higher welfare and health care expenditures and a more rigid labour market, helps to broaden our knowledge of welfare transmission between generations. The extent of such a transmission between generations has vital policy implications, since correlation in SA between parents and children might result in higher long-run welfare expenditures in the future. Thus, policy measures such as lowering taxes on labour, and/or subsidizing and extending childcare, might support families to the same extent as the receipt of SA benefit in financial terms. However, such policy alternatives might circumvent the risk of intergenerational welfare dependency, disrupting the cycle of deprivation between parents and children.

This analysis uses a sample of young adults (aged 22 and above) from the first nineteen waves of the German Socio-Economic Panel Study (SOEP), spanning the time period 1984-2002. Various estimation procedures are applied, including probit, tobit, instrumental variable and non-parametric estimations. For each estimation strategy, the identifying assumptions are discussed on which inferences about intergenerational links of SA receipt can be drawn.

[6] Several reasons for a lower proportion of SA recipients in East Germany compared to West Germany are discussed in depth in Section 4.2.

The empirical results of this paper indicate that there exists an intergenerational link in SA in Germany. Among children whose parents receipt SA during their late childhood years, sons show a higher propensity and expected duration of receiving SA as young adult in comparison to daughters. No significant differences are found between young women living in East and West Germany, whereas men in East Germany are more likely to live in a household with SA receipt as young adults than their counterparts in West Germany. The estimates suggest that parental divorce during childhood years is associated with a higher propensity to receive SA for adult daughters, but not for sons. No significant effect is found for maternal employment history during childhood on children's propensity to live in a SA household as young adults. Both the Rivers and Vuong (1988) and the Smith and Blundell (1986) two-step procedures suggest that parental SA duration during late childhood years is not endogenous. That is, the estimated correlation in SA participation among generations seems not to be due to unobserved time-invariant family-specific heterogeneity, such that parental motivation, temperament and attitudes towards work and the family affect both parents' and their children's propensity to receive SA benefit.

The rest of the paper is organized as follows. Section 2 reviews the related literature. Section 3 discusses methodological and conceptual issues in estimating intergenerational welfare dependency. Description of the data and summary statistics are presented in Section 4. Section 5 explains the various estimation procedures. Section 6 presents the main results and section 7 concludes.

2. Background literature

In the United States (US), numerous studies have examined the effects of welfare exposure on outcomes for children in later life. The main findings of the literature may be summarized as follows.[7] First, daughters who grew up in a family that received AFDC are more likely to become recipients as adults themselves (McLanahan, 1988; Solon *et al*., 1988, Gottschalk, 1990) and have a higher expected duration of future welfare dependency (Antel, 1992, Pepper, 2000). Second, growing up in a 'welfare family' is associated with a higher probability of teenage pregnancy (An et. al, 1993). Third, there exists no clear

[7] The estimation methods, extracted samples and included variables vary widely among the empirical studies. In addition, the analyses rely on different identifying assumptions. Since empirical results are sensitive with respect to distributional and exclusion restriction assumptions (Pepper, 2000), comparisons and policy recommendations must be drawn with caution. The present short review of the empirical results on welfare

consensus whether children from welfare families score lower on cognitive test scores or not (Hill and O'Neill, 1994; Peters and Mullis, 1997; Levine and Zimmerman, 2000). Fourth, daughters whose parents received welfare at some point during their childhood end up with fewer years of schooling (Hill and Duncan, 1987; Butler, 1990) and lower chances of high school graduation (Corcoran *et al*., 1992; Corcoran and Adams, 1993). Fifth, mothers' Aid to Families with Dependent Children (AFDC) welfare is found to have no influence on children's birth weight and on prenatal care (Currie and Cole, 1993). Finally, sons from 'welfare families' work fewer hours, have significant lower earnings, hourly wage rates and family income (Corcoran *et al*., 1992).

The present empirical estimates of the intergenerational social assistant receipts mainly build on Moffit's (1983) economic model of welfare stigma, the role model theory (Mayer, 2002) and also on the welfare culture hypothesis (Macaulay, 1977). The first theory states that individuals prefer private income over public welfare income due to a negative social stigma associated with the receipt of welfare. Based on this model, parent's receipt of SA may influence their children's distaste for welfare participation in later life such that they develop attitudes and tastes which make them less prone to feel stigmatized, decreasing the hassle to apply for social assistance, resulting in a higher likelihood of living on welfare than otherwise identical adolescents whose parents received no social assistance benefits (Gottschalk, 1990). Furthermore, children whose parents received SA during their youth might face lower claim costs, i.e. cost of acquiring information about potential welfare benefit entitlements due to their "welfare experience" during their adolescent years. Both the role model theory and the welfare culture hypothesis, carried forward in the context of intergenerational welfare dependency, state that parents who receive social assistance develop values, norms and attitudes that are obstructive to "success in life", such as high levels of educational attainment, being successful in working life, i.e. reaching certain occupation or earning (income) levels (Macaulay, 1977; Mayer, 2002). In short, parent's dependence on SA might result in discouraging children's independence, lowering their self-esteem and aspirations, decreasing their motivation for educational attainment and success in the labour market.

3. Methodological problems and conceptual issues

dependency is rather limited. For a detailed overview of the existing literature, see Haveman and Wolfe (1995) and Mayer (2002).

Empirical research on intergenerational mobility in general and transfer of welfare dependency among generations in particular are difficult to estimate in a robust fashion. That is, studies in this field face various estimation problems and reveal several weaknesses in capturing and estimating a causal link between parents' and children's behaviour, rather than correlation in unobservables across generations:

(1) A major problem in estimating determinants of intergenerational correlation is the difficulty in distinguishing unobserved family heterogeneity from a true, causal relationship (Manski *et al*., 1992). If family characteristics and children's outcome variables are driven by some unobserved, unmeasured causal factors, the point estimates might be biased. For example, parental motivation, temperament and attitudes towards work and the family might affect both generations' propensity to receive SA.

(2) Many US studies examine the effect that growing up in a family that receives AFDC has on welfare participation of young adults. Gottschalk (1990, 1992) points out that comparing the probability of daughter's from welfare families receiving AFDC with the probability for all those daughters whose mother did not receive welfare support might be misleading. As outlined by the program evaluation literature (Manski, 1996; Heckman *et al*., 1997), the key issue here is eligibility, which implies that the appropriate comparison group are those adult daughters' whose mothers were eligible for receiving AFDC, but did not claim and receive it. Therefore, by comparing children whose parents lived on welfare with children whose parents did not, independent of the eligibility issue, one risks overstating the magnitude of intergenerational welfare dependency.

(3) Most analyses are limited by short observation windows over which parents, mostly mother's welfare participation, and daughters potential welfare receipt are observed.[8] The shorter these observation windows are, the higher the risk that the intergenerational welfare dependency might be spurious, picking up a correlation in the business cycle in these specific years rather than estimating a genuine link in welfare receipt among generations. Furthermore, short observation windows may result in an over-representation of long-term welfare recipients, since long-term welfare dependents have a higher probability of being observed in any given year. Thus, point estimates based on short observation windows risk being biased upward.

(4) A minority of studies control for family structure and stressful events during childhood (i.e. experience of lone parenthood, re-marriage, geographical household moves,

[8] See An *et al*., 1993; Antel, 1992; Wolfe *et al*., 1996. Pepper (2000), explicitly focusing on the length of welfare participation, uses five-year observation windows for both parents and children.

parental unemployment or economic inactivity).[9] However, there exists a strong agreement in the general intergenerational literature that family events during childhood play a key role in the development of children and their later life outcomes (Haveman and Wolfe, 1995; Mayer, 2002 for the US, and Ermisch and Francesconi, 2001, Ermisch *et al*., 2004 for the United Kingdom).

(6) Correlations between family welfare receipt and parental unemployment, family income, poverty experience or social housing tenure during childhood years are very likely (Jenkins et al., 2001). By not adequately controlling for and disentangling these related factors from parental SA receipt, an intergenerational link in welfare dependency may not necessarily be the result of SA experience during late childhood years per se, rather than capturing an association between child poverty and deprivation and welfare receipt in later life.

Keeping these problems and shortcomings in mind, the present study tries to deal with these issues by using different sample selection procedures, control variables as well as various estimation methods.

4. Data

The data is from the German Socio-Economic Panel Study (SOEP), combining waves 1–19 (survey years 1984–2002) and the retrospective lifetime employment, marital and fertility histories.[10] The SOEP is a panel survey representative of the German private households population, with interviews first conducted in 1984 for residents in the Federal Republic of Germany (FRG) and annually thereafter.[11] Foreigners are overrepresented in the sample in order to ensure large enough sample sizes. In 1990, the SOEP was expanded to the territory of the German Democratic Republic (GDR), including nearly 2200 new households. In the years 1994/1995, two additional samples were selected consisting of

[9] Studies examining the effects of the AFDC program cannot distinguish between, for example, experience of intact versus non-intact (single, divorced, widowed) families during childhood years due to the nature of the welfare program. An *et al*. (1993) control for the number of parental household moves during daughters' childhood years aged 6-15, when estimating daughters' probability of receiving welfare subsequent to an out-of-wedlock birth.

[10] Maternal history data come from different sources. Employment history variables come from the PBIOSPE file of the GSOEP data. This file contains spells of employment, distinguishing between school/university, apprenticeship/training, military/civilian service, full-time employment, part-time employment, unemployment, housework, retirement and other statuses, starting in the year respondents were aged 15. Marital history and family status variables stem from the file BIOMARSY, which is saved in spell format as well. Family status is distinguished in: single, married, widowed, divorced. Birth information comes from the files BIOBIRTH as well as the $KIND files.

[11] For detailed information on the GSOEP methodology, representativeness, and weighting see Haisken-DeNew and Frick (2003) and Burkhauser *et al*. (1997).

households in which at least one household member had immigrated from abroad to West Germany in the years following 1984. Individuals are re-interviewed each successive year, and in the year a child in a sample household turns 17, she or he is interviewed in their own right annually thereafter. Similarly, if individuals leave their original household to form a new one, all adults of this new household are interviewed. Thus, the SOEP sample remains broadly representative of the population of Germany as it changes through the late 1980s and 1990s.

The sample used in the analysis consists of young adults aged 22 and over whose parents were either SA recipients during their late childhood years or had an average equivalent family household income (during all observed childhood years) which was below the 30th percentile of the income distribution.[12] Note that young adults who still live with their parents are included in this sample.[13] Thus, the sample allows me to compare adult children whose parents were welfare recipients with young adults who grow up in poor households with parents who did not receive SA.[14]

[12] Various robustness checks were conducted with respect to the income threshold used for the sample selection, using the 25th, 35th, 40th and 50th percentiles. Using different sample selections did not change the main results. For example, using the 25th percentile as the income threshold yields a sample in which the average household income during childhood years is lower for children whose parents did not receive SA compared to parents who were SA recipients. Despite growing up in a 'welfare household' with on average higher household income than the comparison group, the results still suggest the existence of an intergenerational SA dependency.

[13] Extracting a sample on the basis of age compared to cohabitation (i.e. selecting young adults who have established their own household only) has the advantage of circumventing potential selection bias. If children's unobservable characteristics are correlated with both the timing of leaving their parents home and the propensity to receive SA, the estimated coefficients risk to be biased in a sample including young adults who established their own household only. SA receipt information in the SOEP is available on the household level only. However, eligibility for SA in Germany is determined by needs communities, so-called "Bedarfsgemeinschaften". These need-units are defined on the basis of the Federal Social Assistance Law and consist of parents and children (aged 18 and less) living in the same household. Thus, the present sample has the caveat that those young adults who still live with their parents who are SA recipients might not receive SA themselves according to the eligibility criteria, but are defined as living in a household receiving SA due to the fact that their parents receive welfare benefit payments. However, according to the German SA program it is obligatory for parents and their adult children to support each other (even if they do not live in the same household) before claiming SA benefits. Thus, even though the household and the needs community are not identical if young adults still live in their parent's household, it is plausible from an economic perspective to extract the present sample. What is more, the SA rate among young adults still living at home is considerably lower in comparison to those who do not live with their parents. This suggests that the present estimates are unlikely to overstate intergenerational SA dependency due to young adults who still live with their parents. 7 percent (daughters: 2%; sons: 10%) of young adults living with their parent(s) are defined as SA recipients compared to 16 percent (daughters: 20%; sons: 10%) who established their own household. Thus, these figures clarify that extracting a sample on the basis of cohabitation might result in severe sample selection bias.

[14] In previous work, three additional samples were extracted. First, instead of comparing young adults who grow up in 'welfare households' with adult children from poor households (whose parents did not receive SA), I compared them with all adult children whose parents received no welfare benefit, irrespective of their family income during childhood years. In line with Gottschalk's argument (1990, 1992), the coefficients were considerable larger in magnitude in comparison to the ones reported in this paper. This underlines Gottschalk's point (1990) that these estimates "overstate the degree of intergenerational correlation". Second,

I use late childhood rather than earlier childhood years as an observation window to measure parental welfare receipt since it is unlikely that young children realize and are informed about parental SA receipt. Arguments raised by the theory that children of 'welfare families' face lower claim costs and have lower distaste for welfare since they learn to feel less stigmatized are based on the assumption that they realize and are aware of parental welfare receipt during their childhood. Additionally, an observation window spanning earlier childhood years would decrease the sample size considerably. More detailed description of the sample selection, sample size and estimation methods are shown in Table 1.

>Table 1 around here <

Definitions of the variables are presented in Table 2. Descriptive statistics are presented in Table 3 and 4. In both Tables, the variables are grouped into two main categories 1) dependent variables 2) independent variables. Means and standard deviations distinguished by sex are presented in Table 3. In Table 4, summary statistics are reported by parental SA receipt during young adults' late childhood years (age 13-16). Table 3 shows that the percentage of daughters living in a household with SA receipt as young adults is higher in comparison to sons. 16 percent of daughters aged 22 and above live in a household with SA receipt, compared to 10 percent of adult sons. Similarly, the average duration of SA receipt as

young adult is much higher for women in comparison to men. Over all, young persons' average age is 27, around 11 percent live in East Germany and more than one third of the adult children do not have the German citizenship. Parents' average SA duration during late childhood years is around 26 months. Note that the proportion of daughters who grow up with parents who received SA payments during their late childhood years is higher in comparison to sons (19 versus 13 percent). 48% of adult sons still live with their parent(s), whereas the figure for daughters is considerably lower (30%).

I extracted a sibling sample of young adults with at least one interviewed sibling present in the sample. Sibling fixed-effect estimators allow to control for unobserved time-invariant family specific characteristics. Unfortunately, the sample size was small and there were too few differences in siblings' SA exposure during late childhood years in order to get sensible results. The third sample consists only of young adults who established their own household and for whom parental SA receipt information during their late childhood years (ages 13-16) are available. Similar to the present results, the estimates suggest a positive correlation in intergenerational SA receipt, but were smaller in magnitude and significant at the 10%-level only. Furthermore, the number of 'positive' outcomes (i.e. SA receipt as young adults) were small and the sensibility of the estimates thus questionable.

Table 4 reports descriptive statistics distinguished by parental SA receipt during late childhood years. Several statistics are worth mentioning. First, the proportion of young adults living in households supported by SA payments is considerably higher among those whose parents were SA recipients in comparison to young adults whose parents did not receive SA during late childhood years (28 versus 10 percent). Second, the average number of months of SA receipt is nearly three times as high for those from "welfare families". Third, there exist no huge differences in the average pre-government household incomes during childhood years between families who received and did not receive SA payments.[15] Parents without SA receipt during late childhood years had on average an annual family household income which was around 600 € higher in comparison to families who lived on SA payments. Fourth, slightly more than 40 percent of young adults whose parents were SA recipients grow up in a non-intact family compared to 23 percent whose parents did not receive SA payments. Similarly, the proportion of children who grow up in a household with a non-married or widowed mother or whose parents divorced during their childhood is higher among those from 'welfare families'. Fifth, the average number of years mothers were not employed (employed) during young persons' entire childhood is higher (lower) if parents were SA recipients. Finally, the number of years parents lived in social housing is also higher among parents who received SA payments in comparison to those who did not. Thus, the descriptive statistics in Table 4 show that there exist considerable differences in both parents and adult children's observed characteristics according to parental SA receipt, even though we have a sample of young adults who grow up in poor households.

Monthly SA receipt duration in the SOEP is gathered annually via a retrospective filter question. First, it is asked whether the household received SA last year. If this is the case, the monthly information is asked thereafter (separately for income support (Hilfe zum Lebensunterhalt) and support in special circumstances (Hilfe in besonderen Lebenslage), see Appendix A for further information about the German SA system).[16] As a result, in 35% of the cases respondents received SA in the prior year, we have missing information on the monthly social assistance duration. I impute this missing information with average values according to the marital status and the presence of children in the household. Five groups are distinguished: (1) single women; (2) single mothers; (3) single

[15] The equivalent pre-government household income is measured as an average over all childhood years for which income information are available. I include permanent income since previous research has found that it is permanent rather than current income which has a higher influence on children's outcomes (Blau, 1999; Jenkins and Schluter, 2002). Need adjustment is calculated according to the OEDC equivalence scale.
[16] See http://panel.gsoep.de/soepinfo2002/ for further information about the questionnaire in the SOEP.

men; (4) couples without children; (5) couples with children. In line with figures of the official statistics (Statistisches Bundesamt, 2003), the average duration of receipt of single women and lone mothers is considerably higher in comparison to the other groups.

5. Model estimates

The focal point in estimating intergenerational welfare dependency is the identification of a causal, genuine effect between parents and children's welfare receipt, rather than spurious links due to endogeneity or unmeasured heterogeneity in family background. This section describes alternative estimation strategies aimed to analyse intergenerational SA dependency. For each estimation procedure, we start with a short, non-technical description, explicitly pointing out strength and weaknesses of the alternative estimations. In particular, I discuss the various a priori identifying assumptions on which the estimation strategies are based on and under which inferences can be drawn. Afterwards, a detailed outline of the statistical method is presented.

5.1 Probit and Tobit estimations

Following previous studies (Gottschalk, 1992; An *et al*., 1993), I start analysing intergenerational links in welfare dependency by estimating parametric models assuming that parental SA duration during late childhood years is exogenous. In other words, it is assumed that unobserved family characteristics do not affect both children's and parent's propensity and duration to live on welfare benefit.

Probit model with exogenous explanatory variables

Receipt of social assistance for young adults is given by the linear model of the form:

$$s = X\beta_1 + p\gamma_1 + e_1 \qquad (1)$$

where s, p are $N \times 1$ and X is $N \times K-1$, where N denotes the number of young persons and K represents the number of exogenous variables. The *i*th element of the vector s with $i = 1,...,N$ indicates whether the child *i* of the *j*th family receives SA $(s_{ij} = 1)$ or not $(s_{ij} = 0)$. X is a vector of individual and parental explanatory variables, p is a vector of dummy variables indicating whether parents' received SA receipt during a young persons'

late childhood years[17], the error vector e_1 includes time-invariant family specific unobservable factors like parental motivation, parents' temperament and attitudes towards work and the family, with $e_1 \sim NID(0, \sigma^2_{e_1})$. The probability that a young person receives SA is given by

$$P = \Pr(s_{ij} = 1 \mid x_{ij}, p_{ij}) = \Pr(-e_{1ij} \leq x_{ij}\beta_1 + p_{ij}\gamma_1) = \Phi(x_{ij}\beta_1 + p_{ij}\gamma_1)$$

where Φ denotes the cumulative standard normal distribution. Using maximum likelihood techniques, the probit model estimates whether or not parental welfare receipt during childhood increases the probability of social assistance receipt in later life.

Tobit model with exogenous explanatory variables

The vector m $(N \times 1)$ denotes the number of months a young adult receives social assistance in later life (aged 22 and over). The setup of the model is such that,

$$m = \begin{cases} 0 & \text{if} \quad X\beta_2 + p\gamma_2 + e_2 \leq 0 \\ 48 & \text{if} \quad X\beta_2 + p\gamma_2 + e_2 \geq 48 \\ X\beta_2 + p\gamma_2 + e_2 & \text{otherwise} \end{cases} \qquad (2)$$

where e_2 is $NID(0, \sigma^2_{e_2})$ and uncorrelated with both X and p. A positive γ_2 in the tobit model specification implies that parental SA receipt increases children's expected welfare duration in later life.

To summarize, if the identifying parametric assumptions of the probit and the tobit model are incorrect and/or unobserved factors exist that jointly influence parents' and children's propensity to receive social assistance, the estimates do not yield conclusive, reliable results on intergenerational transmission of welfare dependency. That is, if unobserved family endowments in the disturbance are positively correlated with parental SA receipt on the one hand and the child's likelihood and expected duration of welfare dependency on the other hand, the estimates risk being biased upwards. What is more, heteroskedasticity and non-normality of $e \sim (e_1, e_2)$ yield inconsistent estimates in both models. However, the estimates enable us to compare the results with prior studies and provide a benchmark for the following estimates.

[17] p_d indicates a vector of continuous variables indicating parents' duration of SA receipt during late

5.2 Probit and Tobit estimations with an endogenous explanatory variable

To identify the causal effect of parental welfare exposure on children's propensity of welfare receipt and expected welfare duration, it is helpful to have variation in parent's duration of SA receipt that is exogenous to their unobserved characteristics. Instrumental variable (IV) estimations allow identification of a causal link in intergenerational welfare dependency if the instrumental variable z $(N \times 1)$ is correlated with parental welfare duration p_d (once all the other covariates are netted out) but uncorrelated with unobservable family characteristics.[18] Thus, it is possible to identify the causal effect if the instrument is orthogonal to the unobservable factors which may affect the propensity and duration to live on SA in later life. I use the striking differences in the proportion of SA recipients between East and West Germany as an instrumental variable candidate. Figure 2 shows the proportion of SA recipients in East and West Germany during the 1990s. Even though the SA rates in East Germany increased considerably, the proportion of recipients during these years was always lower in comparison to West Germany. There are several potential reasons for these striking differences. First, in the former GDR, employment participation rates for both women and men were high. Thus, households with unemployed members in East Germany can claim to a higher extent for either unemployment benefit or unemployment assistance than comparable households in West Germany. Second, the introduction of active labour market policies in East Germany after the reunification might have helped families in such that they did not have to live on SA payments. Third, as a consequence of the traditionally restrictive Sozialfuersorge[19] in the former GDR, take up-rates of SA after the unification might have been lower in East than in West Germany (Kayser and Frick, 2001).

Similar to other instrumental variables based on geographic and local information used in prior work (Antel, 1992; Levine and Zimmerman, 1996; Pepper, 2000), the present IV candidate might be potentially endogenous if parental decision to live in the eastern or western part of Germany is correlated with unobserved family characteristics. If distaste for SA among parents in East Germany was indeed lower in comparison to parents living in West Germany, the IV candidate 'lived in East Germany during childhood years' might

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childhood years (age 13-16).

[18] See Bound *et al*. (1995) and Stock and Staiger (1997) for problems resulting from using weak instruments.

be correlated with the error term, violating a key identifying assumption. Thus, as further robustness checks, I use two additional IV candidates in order to investigate potential parental SA endogeneity. First, the average local unemployment rate faced by parent(s) during late childhood years is used as an IV candidate. [20] Second, I use the striking differences in the SA rate between northern and southern federal states and between urban and rural areas as an additional instrumental variable candidate. Figure 2 in Appendix A clarifies the north-south variation in the social assistance rates between federal states. Each area represents a federal state (Bundesland). The shading indicates the average SA rates at the end of the year 2002. The darker the area is, the higher the proportion of people living on SA rate. Four different categories are distinguished. The darkest areas represent an average social assistance rate higher than 4.5 percent, followed by the categories 3.6-4.5, 2.6-3.5 and lower than 2.5 percent. It is striking that the southern states Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Thuringia (moving from left to right) have lower SA rates than the northern states. Another stylized fact in Germany concerns the differences in the SA rates between city and urban areas. The social assistance rate by the end of 2002 among 76 selected cities is 5.5%, compared to an average of 3.3% in Germany as a whole (Statistisches Bundesamt, 2003). Note that both the north-south and the rural-city differences existed not only in the year 2002, but also in the late 80s (excluding the former GDR) and during the 90's. Based on these facts, I constructed a variable which indicates the number of years the young person's family lived in a rural area (town or city with less than 50.000 inhabitants) in one of the four "southern" states mentioned above during the childhood years 13-16. Guided by the 'stylized' facts about geographical variation in the SA rate in Germany, one might expect a negative correlation between the instrumental candidate z and the number of months' parent(s) received SA during childhood years. Again, if parental decision to live in the rural southern part of Germany is correlated with unobserved family characteristics, the IV candidate may be correlated with the error term. However, there are good reasons to believe that this is unlikely to be the case. First, there exists no variation in SA levels across federal states which could create an incentive effect to move to more 'generous' federal states.[21] Second, residential

[19] Broadly speaking, the Sozialfuersorge was an welfare program in the GDR similar to the SA program in the FRG.
[20] See Antel (1992), Levine and Zimmerman (1996) and Pepper (2000) for similar IV candidates.
[21] I conducted robustness checks excluding young adults who moved either from East to West Germany during the relevant childhood years or from 'northern federal states' to the 'south'. There were only a few individuals who moved during their late childhood years and excluding these adult children from the sample does not alter the results at all.

mobility among SA recipients is low, compared to the US or the UK (Stahl, 1985). Finally, mobility among families with children in school age is even lower.

In the following, the Rivers and Vuong (1988) and the Smith and Blundell (1986) two-step procedure are shortly outlined.[22] The former applies in the probit framework, the later procedure is relevant in tobit estimations. Both methods provide a test whether parental welfare duration during late childhood years is endogenous or not.

Probit model with endogenous parental social assistance duration

If the error term e_1 of equation (1) is correlated with parental welfare duration during childhood years p, the above probit yields biased estimates of β_1 and γ_1. Let z denote the instrument such that $Cov(e_1 z) = 0$ and $\alpha_1 \neq 0$ in the reduced form equation:

$$p = X\beta_{11} + z\alpha_1 + u_1 = Z\delta_1 + u_1 \qquad (3)$$

In words, it is assumed that the instrument is exogenous and therefore uncorrelated with the error term. The second assumption implies that z is partially correlated with p, once the exogenous variables in X are controlled for (Wooldridge, 2002). Furthermore, it is assumed that (e_1, u_1) is bivariate normal distributed, independent of Z and has a zero mean. The two-step procedure pioneered by Rivers and Vuong (1988) provides us with a method to test whether p is endogenous or not. Let

$$e_1 = \theta_1 u_1 + v_1, \qquad (4)$$

with $Var(e_1) = 1$, $\theta_1 = \frac{Cov(u_1, e_1)}{Var(u_1)}$, $E[v_1 \mid Z, u_1] = 0$ and $Var(u_1) = \sigma_{u_1}^2$. Substituting equation (4) in (1) yields to:

$$s = X\beta_1 + p\gamma_1 + \theta_1 u_1 + v_1 . \qquad (5)$$

Because both error terms (e_1, u_1) are joint normal distributed, it follows that

$v_1 \mid p, Z, u_1 \sim N(0, 1 - p_1^2)$, where $Var(v_1) = Var(e_1) - \frac{Cov(u_1, e_1)^2}{Var(u_1)} = 1 - \rho_1^2$ with

$\rho_1 = Corr(u_1, e_1)$. Since u_1 is unobserved, we estimate the residuals $\hat{u}_1$ of an OLS regression of p on Z. Running a probit model s on $X, p, \hat{u}_1$ results in consistent estimates of $\beta_{1\rho}, \gamma_{1\rho}$ and $\theta_{1\rho}$, where the subscript ρ indicates that all coefficients are divided by

[22] See also Wooldridge (2002) for an excellent discussion. This section draws heavily on his insights into both models.

$(1-\rho_1^2)^{1/2}$. Using the Rivers and Vuong (1988) procedure, it is possible to test whether parental social assistance duration during young persons' childhood years is exogenous $(H_o : \theta_1 = 0)$ or not $(H_1 : \theta_1 \neq 0)$. Note that this test of exogeneity is valid without the assumptions of normality or homoskedasticity of u_1 under H_o (Wooldridge, 2002). If it turns out that H_1 is valid, this two-step procedure indicates whether parental unobservables influence children's unobserved characteristics is such that they manage to escape from 'poverty' as young adults or results in a cementation of social assistance receipt between generations. The former might be the case if parents supported by social assistance invest more in their children (e.g. spend more time with them, help their children with homework, better parenting in general) than they would do otherwise.

Tobit model with endogenous parental social assistance duration

Again, parental social assistance duration p is allowed to be endogenous. Following Smith and Blundell (1986), the setup of the model consists of the following equations:

$$m = \max(0, X\beta_2 + p\gamma_2 + e_2) \qquad (6)$$

with $e_2 = \theta_1 u_1 + v_2$

$$p = X\beta_{11} + z\alpha_1 + u_1 = Z\delta_1 + u_1 \quad (7)$$

$$m = X\beta_2 + p\gamma_2 + \theta_1 u_1 + v_2 \qquad (8)$$

Note the similarities between equation 7 & 8 and equations 3 & 5 respectively. The distributional assumptions accord with the above probit model also.[23] Estimating the reduced form equation (7) yields the estimator $\hat{\delta}_2 = (\hat{\beta}_2, \hat{\alpha}_2)$ with the OLS residuals $\hat{u}_2 = p - Z\hat{\delta}_2$. Estimating a tobit model in the second stage of m on $X, p, \hat{u}_2$ results in consistent estimates of $\beta_2, \gamma_2, \theta_2$, γ, θ and $Var(v_2)$.

Thus, both the Rivers and Vuong and the Smith-Blundell two-step procedures allow us to test whether parental welfare duration during young persons' childhood is endogenous or not and whether the strong exogeneity assumptions made in Section 4.1 above are too restrictive or not.

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[23] Both error terms (e_2, u_2) are bivariate zero-mean normally distributed and independent of Z. In addition, $\theta_2 = \dfrac{Cov(u_2, e_2)}{Var(u_2)}$ and $v_2 \mid p, Z, u_2 \sim N(0, \sigma_{v_2}^2)$

Non-parametric estimates

Is the data alone conclusive? Manski (1989, 1994) developed a method to bound probabilities of interest without imposing any prior identifying assumptions. In the following, I draw heavily on his insights. Since I am interested in whether children whose parents lived on SA during their late childhood years are more likely to be SA recipients as young adults themselves, the treatment variable *p* equals 1 if the parents received SA during children's late childhood years and is zero otherwise. Let y_0, y_1 denote the dichotomous outcome variables of interest. y_0 equals to 1 if the adult child is a SA recipient but the parents did not receive SA during late childhood years and is 0 otherwise. Similarly, y_1 indicates whether adult children are SA recipients or not, given that they grow up in a 'welfare family'. Thus, the probabilities that adult children whose parents were and were not SA recipients are:

$$P(y_1 = 1 \mid X) = P(y_1 = 1 \mid p_{SA} = 0, X)P(p_{SA} = 0 \mid X) + P(y_1 = 1 \mid p_{SA} = 1, X)P(p_{SA} = 1 \mid X)$$

and

$$P(y_0 = 1 \mid X) = P(y_0 = 1 \mid p_{SA} = 1, X)P(p_{SA} = 1 \mid X) + P(y_0 = 1 \mid p_{SA} = 0, X)P(p_{SA} = 0 \mid X)$$

In both equations, the first term on the right-hand sides cannot be observed and the treatment effect is not identified. However, it is possible to bound the probabilities such that:

$$F(X) - P(p_{SA} = 1 \mid X) \leq ATE \leq F(X) + P(p_{SA} = 0 \mid X)$$

with

$$F(X) = P(y_1 = 1 \mid p_{SA} = 1, X)P(p_{SA} = 1 \mid X) - P(y_0 = 1 \mid p_{SA} = 0, X)P(p_{SA} = 0 \mid X)$$

The bounds always contain 0 and therefore do not bound the sign of the treatment effect. Assuming that treatment is randomly assigned and thus exogenous, it is possible to derive the following non-parametric point estimates:

$$ATE(X) = P(y_1 = 1 \mid X) - P(y_0 = 1 \mid X)$$

Note that the ATE is simply the difference in the sample means for the treated (i.e. young adults whose parents received SA during late childhood years) and the untreated individuals (i.e. who grow up in a poor household without SA receipt). Given randomized treatment, the ATE estimator is unbiased, consistent, and asymptotically normal.

6. Results

Three different model specifications are estimated. The core set of explanatory variables included in all model specifications are: age, year of birth, sex, region of residence (East or West Germany), nationality and mother's age at birth (distinguished into three groups: age ≤ 21, age 22-34, age ≥ 35). Additional covariates included in the second model specification are: highest educational degree of the child and the child's mother, young adult's marital status, presence of dependent children aged 15 and below in the household, number of siblings, annual local unemployment rate, whether the young person lives in a metropolitan area or not. The third model specification includes further variables which control for maternal socio-economic factors during childhood years. These are: experience of non-intact family (distinguished between growing up with a non-married or widowed mother; parents divorced during childhood years) and mothers' number of years in economic inactivity and employment during childhood years (ages 0-16), number of years parents lived in social housing during late childhood years.

Probit and tobit model with exogenous explanatory variables

Probit and tobit estimates of all three model specifications are reported in Table 5. For brevity, the estimated coefficients of the set of explanatory variables are not reported.[24] Columns 2-4 in Table 5 contain the results for women, columns 5-7 contain the estimated coefficients for men.

>Table 5 around here <

The coefficients of parental SA receipt are positive and significant in all model specifications for both adult daughters and adult sons. Note that the coefficients in both the

probit and the tobit model are larger in magnitude in comparison to women. In line with the estimates from the probit model, the coefficients from the tobit model imply that parental SA receipt during late childhood years increases the expected duration of young adult's living in a household with SA receipt. Hence, the parametric estimates suggest that parental SA receipt during late childhood years increases the propensity and the expected duration of children's SA receipt in later life.

The influence of other explanatory variables in both the probit and the tobit model

Estimated coefficients and standard errors for all explanatory variables used in model specification 2 are reported in Table 6. The key results might be summarized as follows. Single women, mother's with dependent children aged 15 and less and those women who become mothers at relative young age show a high propensity and expected duration to receive SA. This result is in line with prior empirical evidence of welfare dependency in the US (McLanahan, 1988; Solon *et al*., 1988, Gottschalk, 1990; Antel, 1992, Pepper, 2000) and with official publications by the Federal Statistical Office in Germany (Statistisches Bundesamt, 2003). Adult women living in a city with 100,000 and more inhabitants have a higher likelihood of receiving SA in comparison to those living in smaller cities or the countryside. Daughters with a higher educational degree are less likely to live in a household with SA payments. No differences emerge for young women living in East and West Germany. Contrary, adult sons living in East Germany show a higher propensity to live in a household receiving SA in comparison to sons living in West Germany (significant at the 10%-level).

As mentioned in Section 2, it might be important to control for parental socio-economic factors during childhood years such as family structure and parental employment history, receipt of unemployment benefit and unemployment assistance as well as social housing tenure during childhood years when estimating intergenerational links in SA receipt. Disentangling the influences of these various factors from experience of parental social assistance per se provide insight whether the estimates capture a 'true' association in intergenerational welfare receipt rather than reflecting correlations between child poverty and later life outcomes.

Table 7 presents results from the probit and tobit estimations for the third model

[24] See Table 6 in the Appendix for the estimated results of all coefficients in model specification 2.

specification, which includes additional variables capturing family background and stressful events during young persons' childhood years (lived with single (non-married) or divorced mother, number of years mother was economic inactive and employed) [25]. Furthermore, I allow for the possibility that living in social housing during late childhood years might have an influence on young persons' propensity to receive SA and expected welfare duration once they are aged 22 and over.

>Table 7 around here <

Family structure during childhood years (ages 0-16) shows somehow different effects for adult daughters in comparison to adult sons. Daughters whose mothers divorced during their childhood years show a significant higher likelihood to live in a household receiving SA in comparison to daughters whose mothers did not experience a divorce during their first sixteen years. Furthermore, the probit estimates reveal that maternal economic inactivity is not linked to higher chances that children become SA recipients as young adults. Family structure during childhood years seems to have a greater influence on children's later life outcome than maternal employment history. These results are in line with British and American studies investigating family structure and parental employment history on children's outcomes (Ermisch et al., 2004; McLanahan, 1997). The tobit estimates are in line with the probit model. Note that the number of years parents lived in social housing during late childhood years is strongly positive for adult sons, whereas no significant effect appears for daughters.

Summarizing, both the probit and the tobit model estimates suggest that there exist an intergenerational links in social assistance receipt and duration between generations. These results are consistent with the existing welfare dependency literature in the US, which has documented a positive intergenerational link between parent's and children's propensity to receive welfare payments. However, it is unclear to which extent these results reflect a causal relationship. Using IV estimates might help to solve this puzzle.

[25] In preliminary analysis, I experimented with alternative maternal marital history variables. First, I distinguished experience of a non-intact family by three different childhood development stages (when young person was aged 0-5, 6-10, 11-16 years). Similarly, the variables 'lived with non-married, widowed mother', 'experience of parental divorce during childhood' were divided into three development stages mentioned

Probit and Tobit estimates with an endogenous explanatory variable

In this section I turn to the question of whether parental welfare duration during childhood years is indeed exogenous or whether this is too strong an assumption. An inherent problem in determining the true extent of intergenerational links in SA receipt, rests on the question as to whether parental welfare receipt is endogenous or not. As discussed in Section 5 instrumental variable candidates are used which capture geographic differences in the SA rate. Guided by the 'stylized' facts about geographical differences in the SA rate in Germany, one might expect a negative correlation between the instrumental candidates z and the number of months' parent(s) received SA during childhood years.

Stock and Staiger (1997) show that weak instruments result in biased IV estimations, with the sign of the bias in the same direction than OLS estimates. The authors suggest that the necessary correlation between the instrumental candidate and the endogenous variable can be tested with a "First-stage F-statistic", whereas small values of the F statistic (in particular values less than 5) imply a failure of the key assumption that the instrument is correlated with the treatment. Bound, Baker and Jaeger (1995) provide further guidance to the quality of the instrumental candidate. The authors suggest that "F-statistics close to 1 should be cause of concern." Furthermore, they suggest that the partial R^2 (i.e. the difference in the R^2 of the first-stage OLS with and without the instrumental candidate) provides further information about the quality of the instrumental candidate. Bound et al. (1995) suggest that a partial R^2 below 0.0001 should be cause of concern with respect to the validity of the instrument.

Table 7 reports the results of two separate OLS estimations of the number of months parents received social assistance benefit during late childhood years p on all the exogenous variables Z for all three different model specification (including the IV 'lived in East Germany during childhood years' in the first and the IV candidates 'lived in 'rural south' during late childhood years', 'average unemployment rate during childhood years 13-16' in the second regression). Coefficients and standard errors of the IV candidate 'lived in East Germany during childhood years' are reported in first row, followed by the results of the additional IV candidates ('lived in 'rural south' during late childhood years', 'average unemployment rate during childhood years 13-16'). The partial R^2 and the F-statistic are presented in the third and forth rows, respectively. The instrumental variable

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above. Furthermore, I controlled for mothers' receipt of unemployment benefit and unemployment assistance during late childhood years. None of these variables was statistically significant.

candidates turn out to be valid instruments. In both estimations and for all model specifications, the coefficients are highly negative and significant. The partial R^2 is always greater than 0.01 and therefore well above the 'minimum' value of 0.0001 suggested by Bound et al. (1995). The "First-stage F-statistics" are all above 12 using the first IV candidate and between 6 and 8 in the second regression. These results are in line with the expectations based on the 'stylized' facts discussed in Section 5.2.

In the next step I test the null hypothesis whether parental SA duration is exogenous in both the probit and the tobit equation. Results of the probit and the tobit models including the first-step OLS residuals $\hat{u}_1$ are reported in Table 9. With the exception of model specification (1) and (2) using the IV candidate 'lived in East Germany during late childhood years', the coefficients on $\hat{u}_1$ are far from being significant at the 5% level. The t-statistics in the probit estimation turn out to be in the range of 1.01 and 1.88 and provide no (weak) evidence against the null hypothesis $(H_o : \theta_1 = 0)$. Similarly, the t-statistic in the tobit estimates vary between 0.05 and 1.08 and provide no evidence suggesting that parental SA duration during late childhood years is endogenous. Note that the t-statistics (in absolute values) are lower the more explanatory variables are used in the estimations. This suggest that by adequately controlling for children's and mother's socio-economic characteristics one might diminish the risk of parental SA endogeneity. As further robustness checks, the validity of the IV candidates was examined using two alternative samples. First, in order to investigate the instrument 'lived in 'rural south' during late childhood years', a sample was constructed using young adults who grow up in West Germany only. Second, the IV candidate 'lived in East Germany during late childhood years' was further scrutinised by extracting a sample of young adults born between 1974-1977. The later sample allows me to investigate on the IV candidate by using only young adults who could have lived in East Germany during the 1990s while being in their late childhood years. For both samples, the validity of the IV candidates was confirmed, strengthening the evidence that the instruments are valid in identifying a causal intergenerational effect. What is more, these results are consistent with previous empirical studies of welfare dependency in the US. Antel (1992) found no evidence that mother's welfare status during daughter's ages 14-19 is endogenous. Similarly, Gottschalk (1986) concludes: "The estimates presented in this paper provide little evidence that the intergenerational correlation in welfare participation among non-blacks is spurious."[26]

[26] However, the author found some evidence that part of the correlation for blacks might be spurious.

Non-parametric estimates

Table 9 reports the results from non-parametric and liner probability models. For convenience, only the estimates of the treatment variable 'receipt of social assistance during childhood years 13-16' in the parametric models are reported, estimated coefficients from the other variables can be obtained from the author upon request. Columns 2 and 3 contain Manski's lower and upper bounds. Non-parametric treatment estimates assuming conditional independence (exogenous assignment) are presented in column 4. Manski's bounds and the ATE in both samples are computed without conditioning on any covariates other than sex. The remaining columns show the estimates from linear probability models for the three different model specifications. Bootstrap standard errors in columns 2 and 3 are reported in brackets. They indicate that the bound estimates are precise. Even though the bounds cannot fix the sign of the treatment effect, they are informative nevertheless. Note that in absolute terms, the lower bound is always much smaller than the upper bound. Furthermore, the Manski bounds for sons are more shifted to positive values in comparison to adult daughters. The ATE estimates suggest that children whose parents received SA benefit during their late childhood years have a higher chance of living in a 'welfare household' when aged 22 and above. Comparing the point estimates from the three different parametric models shows that they are qualitatively very similar to each other. What is more, these estimates are also very similar in sign and magnitude to the ATE estimates. The parametric and non-parametric estimates suggest that parental SA receipt during late childhood years is associated with an increase of 10-26 percentage points of living in a household with SA receipt as young adult.

Take-up rate and further child outcome measures

There exists empirical evidence for Germany that the non-take up rate of SA benefit is between 50-60 percent (Kayser and Frick, 2001; Riphan, 2001). By comparing young adults whose parents were SA recipients during their late childhood years with parents who were eligible, but did not take-up this means-tested benefit, the present estimates take parents' non-take up of SA into account. What about adult children's take-up rates? I use several control variables which are found in previous work to have a significant influence on take-up behaviour in Germany. The residential information (living in East/West

Germany, rural/city area) and the presence of dependent children in the household are used as proxy variables in order to capture differences in young adult's take-up rates. Kayser and Frick (2001) found that households with dependent children aged 17 and less and those living in metropolitan areas are more likely to take-up SA benefits. In addition, households in East Germany have a lower likelihood to claim benefits in comparison to households in the south of Germany. What is more, the authors report empirical evidence that those who never attend church or religious meetings have a significantly higher chance to take-up SA. As a robustness check, I included a similar variable for a sub-sample of young adults for whom the religious meetings information was available. Including this additional variable did not change the results at all.

Consider the following 3 person *ABC* economy: Young adult *(A)ndrea* grew up with parents who were SA recipients during her late childhood, while *(B)ettina* and *(C)arlos* parents were poor during their late childhood years, but did not receive SA benefits. Years later, as widowed mother, *A* faces severe difficulties in raising her two sons and being employed at the same time. Not working, she claims SA benefit and receives monthly benefits of 1200 €. *B*, aged 27 and single mother of twins, managed to find a nursery place for her children which enables her to work 3 days per week, earning a salary of 900 €. Even though *B* could apply for SA support, she does not claim welfare benefit. *C*, single father and suffering from long-term depression, lives on 1000 € SA payments. In the present estimation, *A* would drive the results for intergenerational SA correlation, *B* and *C* would not. Now suppose that there exists a significant link between parents' and children's welfare receipt in our *ABC* economy and the policy adviser of the government suggests abolishing the SA program due to 'negative' intergenerational correlation induced by the welfare system. Such a policy recommendation would be based on the assumption that young adults who are SA recipients are 'worse' of in financial terms than their counterparts not living on welfare benefits. This is clearly not the case in the *ABC* economy. Furthermore, the recommendation implies that the correlation might be the result of children's altering attitudes (i.e. lower self-esteem or labour market aspirations) due to parental SA receipt during their youth. However, *A's* social assistance receipt might be mainly triggered by her husband's death. Thus, the intergenerational link should be interpreted as a benefit rather than as 'negative' intergenerational dependency.[27]

This *ABC* example exemplifies that it is key to control for SA take-up and to examine the financial situation and other socio-economic outcomes (i.e. unemployment,

economic inactivity, education, health status, early childbirth, smoking behaviour) of young adults. Table 10 reports different outcomes for young adults whose parents received SA during their childhood or had an average household income below the 30th percentile of the income distribution. For most of the outcome variables, there exist striking differences between young adults who are SA recipients and those who are not (exceptions are: worry about overall economic situation, weekly hours of work, health condition)[28]. The percentage of children living in social housing, being unemployed or economic inactive among those who receive SA payments as young adults (aged 22 and above) is considerably higher in comparison to those who are not support by this means-tested benefit. For example, 26 percent of young adults who receive SA are currently unemployed, compared to 8.6 percent among those adult children who are not SA recipients. The percentage among the former group with a higher educational degree is lower and they are more worried about their own financial situation and job security (those who actually have a job) than their comparison group. Furthermore, the net monthly income among adult children who were SA recipients is lower in comparison to young adults who did not claim this means-tested benefit. Note that nearly 60 percent of young adults who are SA recipients are smoker, whereas less than 1 in 2 adult children smoke among those who are not supported by welfare payments.

Thus, the descriptive statistics in Table 10 suggest that the intergenerational link in SA receipt is not driven by low take-up rates of young adults who are eligible for welfare benefits and are 'worse' off with respect to various outcomes in comparison to those who take-up this means-tested benefit. In addition, it seems very unlikely that the above '*ABC* economy' example applies for adult children in Germany. There is no evidence that young adults who receive SA support are better of (in terms of various outcomes) than their counterparts without welfare receipt.

>Table 10 around here <

[27] See Gottschalk (1996) for a similar argument.
[28] Note that the different outcomes are measured in the last year the young adult is observed. Thus, the outcome variables are not necessarily observed in the same year the person received SA benefits.

7. Conclusions

Using data from the German Socio-Economic panel study (SOEP), this paper investigates the extent of intergenerational links of SA receipt in Germany. Several related questions are addressed. Does parents' SA duration increase the future welfare dependency of children? Given exposure of welfare at home, are daughters more likely to live on SA later on than sons? Are there any differences in the probability of welfare dependency among young adults from the former East and West Germany?

The empirical results suggest that parental SA receipt during late childhood years increases children's propensity and expected duration to receive welfare benefit when they are young adults. There exist significant differences in intergenerational SA receipt between daughters and sons. Given parental SA receipt during late childhood years, sons are found to have a higher propensity and expected duration of receiving SA in comparison to daughters. This might suggest that parents' welfare receipt during youth years has more severe impacts on sons' values, norms and attitudes that influence later life outcomes in comparison to daughters. No significant differences are found between young women living in East and West Germany, whereas men in East Germany show a higher propensity to live in a household with SA receipt as young adults than their counterparts in West Germany. Furthermore, the estimates suggest that parental divorce during childhood years is associated with a higher propensity to receive SA for adult daughters, but not for sons. No considerable effect is found for maternal employment history during childhood years on children's propensity to live in a SA household as young adults.

Geographical differences in the social assistance rates between East and West Germany, northern and southern federal states as well as between rural and urban residential areas allows me to extract instrumental variables never exploited before. Using these IV variables, the estimates suggest that parental SA duration during late childhood years is not endogenous. That is, the estimated correlation in SA participation among generations appears not to be due to unobserved, time-invariant family specific heterogeneity, such that parental motivation, temperament and attitudes towards work and the family affect both parent(s), and their children's propensity to receive social assistance benefit.

Comparing the outcomes of adult children whose parents' received SA with poor parents who did not claim and take up this means-tested benefit seems to result in more

reliable estimates than comparing adult children who grow up in 'welfare families' with all other young adults whose parents did not receive SA, irrespective of their household income, i.e. neglecting the eligibility aspect. The present estimates for Germany are in line with Gottschalk's (1990) argument that by using the later comparison group one risks to "overstate the degree of intergenerational correlation".

Given the current debate over a future consolidation of the SA with unemployment assistance benefits in the Lower House of the German Parliament, this research provides insight into long-term intergenerational consequences of parental SA receipt duration in Germany. If the results hold up to scrutiny, it is suggested that alternative policy measures such as lowering taxes on labour, and/or subsidizing and extending childcare, might support families to the same extent as the receipt of SA benefit in financial terms. However, such policy alternatives might avoid the risk of intergenerational SA dependency, disrupting the cycle of deprivation between parents and children.

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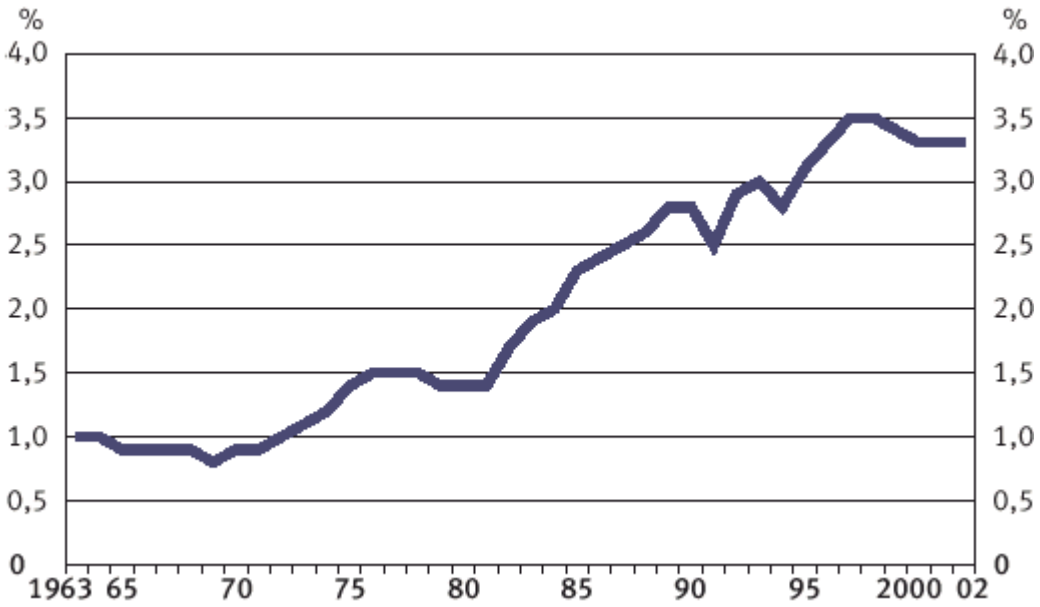
Appendix A

The German social assistance program

The aim of the German social assistance program is to help individuals who are not able to support themselves with a decent standard of living and who lack otherwise sufficient help by family members or social institutions. According to the type of emergency, this means-tested program is made up of two main components: (1) income support (Hilfe zum Lebensunterhalt) and support in special circumstances (Hilfe in besonderen Lebenslagen). The former applies for persons who cannot afford basic needs such as food, clothes and housing. The support of special circumstances is granted to persons in particular emergencies, mainly individuals with health problems, handicapped people supporting in order to support integration into the labour market or individuals needing nursing in their daily life. Social assistance benefit payments in the case of health problems comprise doctoral and dentist treatment, delivery of drugs, dental prosthesis, dressing material etc.. In particular, persons without health insurance receive this type of social assistance support. Reintergration into the labour market for handicapped persons mainly consists of employment in public supported institutions and therapeutic treatment. Help of nursing applies to handicapped or sick persons who need care support in their daily lifes.
By the end of 2002, 2.76 Mio. persons in 1.44 Mio. households received income support in order to cover their socio-culturell minimum income. This corresponds to 3.3 percent of the population and represents a threefold increase since the introduction of the social assistance program in 1969. The social assistance benefit rates vary considerable among population groups. Children aged 18 and younger, women and foreigner have above the average social assistance benefit rates at the end of 2002 (6.6 percent, 3,7 percent and 8,4% respectively). In particular, lone mothers show very high rates with 26,1 percent of all lone mothers living on social benefit in 2002, compared to 19,2 percentage in 1980 (See Statistisches Bundesamt, 2003).

Figure 1: Social assistance rate in Germany[a], 1963-2002



[a] before 1991: Federal Republic of Germany only.

Source: Statistisches Bundesamt 2003, pp. 17

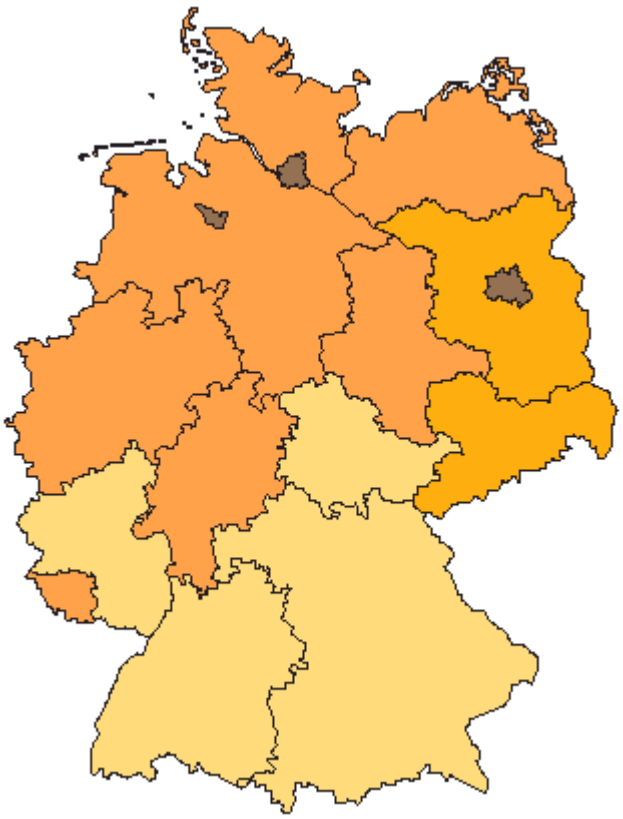
Figure 2: Social assistance rates in East and West Germany

<Figure 2 around here>

Source: Geissler, R. (2002), pp. 247.

Figure 3: Social assistance rate by federal states (Bundesländer)

(at the end of the year 2002)



Source: Statistisches Bundesamt 2003, pp. 30.

Appendix B

Table 1:
Description, sample size and estimation methods

Sample definition	Sample Size (individuals)	Estimation method
Sample of young adults (aged 22 and over) including a) those whose parents received SA during late childhood years (ages 13-16) b) those whose parents did not receive SA benefit during late childhood years but whose average equivalent family HH income (measured over all childhood years for which income information are available) was below the 30th percentile of the income distribution	494	Non-parametric, probit, tobit, instrumental variable estimation

Table 2:
Definitions of variables

Variable	Definition
Dependent variables	
Social assistance receipt (s)	Dummy taking unit value if person lives in household receiving SA benefit as young adult (aged 22 and above)
Months of social assistance receipt as young adult (m)	Measured on the household level in the years the young person is aged 22 and over
Independent variables *Socio-economic variables of young adults (children)*	
Age	
Female	Dummy taking unit value if person is female
Single	Dummy taking unit value if person is not married
Foreigner	Dummy taking unit value if person does not have the German citizenship
Young person's highest educational degree:	Dummy taking unit value if person's highest educational qualification is the Abitur, university degree or a technical college degree
Presence of children in the household, aged 0-15:	Dummy taking unit value if children aged 0-15 years are present in the household
Socio-economic variables of parents	
Parental SA receipt during late childhood years (ages 13-16)	Dummy taking unit value if parental SA receipt
Number of months parent(s) received social assistance benefits during young persons childhood years 13-16 (p)	Continuous variable
Mother's highest educational degree:	Dummy taking unit value if mother's highest educational qualification is the Abitur, university degree or a technical college degree
Family stress and parental employment variables during childhood years	
Ever lived in 'non-intact' family	Dummy taking unit value if ever lived in single-family (i.e lived with unmarried

	mother, parent's divorced or father died during childhood (age 0-16)
Lived with non-married mother	Dummy taking unit value if lived with non-married or widowed mother during childhood (age 0-16)
Parents divorced during childhood	Dummy taking unit value if parents divorced during childhood (age 0-16)
Geographic variables	
Lives in East Germany	Dummy taking unit value if person lives in the area of the former GDR
Lives in a metropolitan area	Dummy taking unit value if person lives in city with more than 100.000 inhabitants
Annual local unemployment rate	Measured at the federal state (Bundesland) level

Table 3:
Summary statistics by sex

	Women		Men	
Dependent variables	Mean	S. D.	Mean	S.D.
Social assistance receipt as young adult	0.16		0.10	
Months of social assistance receipt as young adult*	31.13	22.4	19.55	14.86
Independent variables				
Age	26.84	3.52	26.78	3.66
Year of birth	1972.8		1971.8	
East German	0.12		0.10	
Foreigner	0.32		0.42	
Mother's age at birth	25.7	5.99	26.6	6.76
Mother's age at birth:				
≤ 21	0.27		0.25	
22-34	0.63		0.61	
≥ 35	0.10		0.14	
Number of months parents' received SA during late childhood years	24.54	14.48	25.79	14.49
Parents' received SA during late childhood years	0.19		0.13	
Still lives with parent(s) +	0.48		0.30	
Annual local unemployment rate	9.78	4.11	9.6	3.97
Number of observations	236		258	

* Computed on adult children with SA receipt only. + 5% (2%) of adult daughters live with their mother (father) only. The corresponding figures for sons are: 10% (2%).

Table 4:
Summary statistics by parental SA receipt during late childhood years (13-16)

Variables	Parents received SA	Parents did not receive SA
Dependent variables		
Social assistance receipt as young adult	0.28	0.10
Months of social assistance receipt as young adult*	7.68 [27.59]	2.58 [25.54]
Independent variables		
East German	0.05	0.12
Foreigner	0.32	0.39
Mother's age at birth	26.3	26.2
Mother's age at birth:		
≤ 21	0.27	0.26
22-34	0.59	0.62
≥ 35	0.14	0.11
Number of months parents' received social assistance during late childhood years		
Annual local unemployment rate	9.16	9.79
Average mean household (pre-government) equivalent income during childhood (in Euro)**	8513.1	9129.9
Lived in non-intact family during childhood years (ages 0-16)+	0.41	0.23
Lived with single, widowed mother during childhood years (ages 0-16)+	0.22	0.15
Parents divorced during childhood (ages 0-16)+	0.30	0.12
Mother's employment history during childhood (ages 0-16). Number of years+:		
Not employed	12.2	10.82
Employed (pt, ft)	3.06	4.26
Number of years lived in social housing	1.17	0.34
Number of observations	79	415

* Figures in brackets are computed on persons who were SA recipients as young adults only. ** The equivalent pre-government household income is measured as an average over all childhood years for which income information are available. In 2001 prices. + Computed on 77 (parents received SA) and 405 (parents did not receive SA) young adults, respectively.

Table 5:
Probit and Tobit estimates

Dependent variables:	Women			Men		
SA receipt as young adult						
Duration of SA receipt as young adult						
Model specification*	(1)	(2)	(3)	(1)	(2)	(3)
			Probit			
Parental SA receipt during childhood years 13-16	0.470	0.861	0.763	1.142	1.111	1.055
	(1.86)	(2.97)	(2.23)	(3.71)	(3.35)	(2.94)
			Tobit			
Parental SA receipt during childhood years 13-16	3.827	5.058	4.028	5.770	5.360	4.896
	(1.89)	(2.65)	(1.96)	(4.59)	(4.21)	(3.77)
Number of observations	236	225	217	258	241	237

| t |-values in brackets. * Model specification (1) includes the following control variables: age, year of birth, sex, region of residence (East versus West Germany), nationality, mother's age at birth (≤ 21, 22-34, ≥ 35) and the average local unemployment rate. Further variables included in model (2) are: highest educational degree of both the adult child and the mother, young adult's marital status, presence of children aged 15 and less in the household, number of siblings and whether the adult child lives in a metropolitan area or not. In addition to the covariates in the second model, model (3) includes: experience of single motherhood or parental divorce during childhood years (ages 0-16), mothers' number of years in economic inactivity and employment during childhood, number of years parents lived in social housing during late childhood years.

Table 6
Probit and Tobit estimates

	Probit		Tobit	
	Women	Men	Women	Men
Age	0.313	-0.039	0.603	0.085
	(3.43)	(0.62)	(1.97)	(0.57)
Year of birth	0.252	0.005	0.453	0.095
	(2.69)	(0.10)	(1.41)	(0.53)
East German	-0.145	1.182	-0.803	4.381
	(0.24)	(1.76)	(0.20)	(1.82)
Foreigner	-0.520	0.456	-3.650	1.806
	(1.67)	(1.48)	(2.13)	(1.76)
Single	0.781	-0.269	3.557	-1.072
	(1.89)	(0.72)	(1.83)	(0.82)
Children in HH,	1.273	0.368	5.841	-0.035
aged 0-15	(3.24)	(1.31)	(2.97)	(0.03)
Number of siblings	-0.068	0.930	-0.166	0.728
	(0.81)	(1.41)	(0.34)	(2.47)
Higher education	-0.748	0.422	-1.749	3.274
	(1.99)	(1.35)	(0.85)	(2.88)
Early childbirth	1.179	-	8.778	-
	(3.49)		(4.03)	
Annual local	0.043	-0.012	0.232	-0.134
unemployment rate	(0.89)	(0.23)	(0.77)	(0.75)
Lives in city	0.867	0.242	4.139	0.557
	(2.99)	(0.98)	(2.43)	(0.58)
Mother's age at birth:				
≤ 21	-0.308	-0.461	-0.077	-0.987
	(1.04)	(1.49)	(0.04)	(0.95)
≥ 35	0.185	-0.068	3.933	0.445
	(0.46)	(0.21)	(1.61)	(0.34)
Mother with higher	-0.546	-	-5.579	-
education	(0.96)		(1.47)	
Number of observations	225	241	225	241

| t |-values in brackets.

Table 7:
Probit and tobit estimates, controlling for family structure, 'poverty' and deprivation during childhood years

	Probit		Tobit	
Variables	Women	Men	Women	Men
Parental social assistance receipt during childhood years 13-16	0.590 (1.78)	1.217 (3.54)	4.031 (2.04)	4.908 (3.83)
Family structure during childhood (ages 0-16):				
lived with non-married mother	0.153 (0.32)	-	0.833 (0.29)	-
experience of parental divorce	0.798 (2.39)	-	4.286 (1.98)	-
non-intact family		-0.781 (2.17)		-1.743 (1.61)
Mother's employment history during childhood (ages 0-16). Number of years:				
Not employed	0.215 (1.30)	0.040 (0.51)	0.370 (0.66)	-0.085 (0.32)
Employed (pt, ft)	0.194 (1.24)	0.029 (0.37)	0.386 (0.71)	-0.115 (0.43)
Number of years lived in social housing during childhood years 13-16	0.146 (1.36)	0.089 (0.92)	1.052 (1.55)	1.299 (3.09)
Log-likelihood value	-62.03	-58.56	-824.92	-780.25
Pseudo R-squared	0.34	0.29	0.04	0.04
Number of observations	217	237	217	237

| t |-values in brackets. Different family structure variables during childhood years are used for daughters and sons due to the fact that the variable 'experience of parental divorce' was dropped in the probit model for sons.

Table 8:
OLS estimates of all the exogenous variables on parental SA duration during late childhood years

	(1)	(2)	(3)	(1)	(2)	(2)
Lived in East Germany during childhood years	-11.273 (5.07)	-11.629 (4.82)	-8.905 (3.57)			
Lived in 'rural south' during childhood years 13-16				-4.070 (2.71)	-3.528 (2.39)	-3.048 (2.24)
Average local unemployment rate during childhood years 13-16				-0.386 (2.11)	-0.450 (2.27)	-0.451 (2.33)
Partial R^2	0.0173	0.0194	0.0106	0.0255	0.0219	0.0184
F-test	25.70	23.24	12.76	8.16	6.74	6.15
Number of observations	494	466	454	494	466	454

| t |-values in brackets.

Table 9:
Probit and tobit estimates
including the residual from the 1. stage OLS regression

Instrument:	'Lived in East Germany during childhood years'			'Lived in 'rural south' during childhood years 13-16' and 'average local unemployment rate during childhood years 13-16'		
Probit	(1)	(2)	(3)	(1)	(2)	(3)
$\hat{u}$	-0.078 (1.88)	-0.072 (1.82)	-0.086 (1.68)	-0.018 (1.01)	-0.053 (1.42)	-0.057 (1.29)
Log-Likelihood	-175.05	-154.38	-152.15	-176.06	-155.02	-152.66
Tobit						
$\hat{u}$	-0.300 (1.08)	-0.283 (1.07)	-0.298 (0.87)	-0.005 (0.05)	-0.084 (0.32)	-0.101 (0.35)
Log-Likelihood	-1790.93	-1675.37	-1669.71	-1791.52	-1675.89	-1670.03
Number of observations	494	466	454	494	466	454

| t |-values in brackets.

Table 9:
Parental social assistance receipt during childhood ages 13-16 and young persons' propensity to receive SA as young adult

Outcome: Receipt of social assistance as young adult	Manski's bounds		Nonparametric estimates (Treatment effect)	Linear probability estimates		
Treatment: Receipt of social assistance during childhood years 13-16	Lower bound	Upper bound		(1)	(2)	(3)
All	-0.20 [0.01]	0.80 [0.02]	0.18	0.19 [0.06]	0.18 [0.06]	0.16 [0.06]
Women	-0.26 [0.03]	0.74 [0.03]	0.10	0.11 [0.07]	0.13 [0.07]	0.10 [0.07]
Men	-0.15 [0.02]	0.85 [0.02]	0.26	0.27 [0.09]	0.26 [0.09]	0.26 [0.09]

The nonparametric estimates and Manski's bounds are computed on the entire sample (distinguished by sex) without conditioning on any explanatory variables. The parametric estimations are conducted for all three model specifications. | Standard errors | are given in parentheses. Bootstrap standard errors for Manski's bounds are obtained with 500 bootstrap replications. Standard errors from the linear probability models are robust to heteroscedasticity. Bounds are estimated for 72 (36 for estimates by sex) groups based on young adult's age (three groups: age $\leq$ 23 years, 24-26 years, $\geq$ 27 years), whether the mother has a higher education (two groups), mother's age the young adults birth (three groups: mother aged $\leq$ 23 years, aged 24-30 years, aged $\geq$ 31 years), adult children's sex and whether they are foreigner or not.

Table 10:
Young people's outcomes by SA receipt status

Outcome variables	Young person receives SA	Young person does not receive SA
Social housing	21.3	8.4
Unemployment	26.56	8.60
Economic inactivity	56.3	24.65
Weekly hours of work*	41.6	39.5
Net monthly income*	1934.4	2129.9
Higher educational degree	9.6	15.7
Worried about:		
overall economic situation	84.8	81.3
own financial situation	90.6	86.8
job security	67.8	53.6
Early childbearing+	43.3	12.1
Smoker	58.3	46.4
Health condition (very good, good)	70.3	70.8

Measured in the last year the young adults are observed in the panel. Note that SA receipt is measured in all years the individual is aged 22 and above. Thus, the outcomes reported are not necessarily measured in the same year as adult children's SA receipt. + Women only. * Computed on employed persons only. ** In 2001 prices.