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Capability Deprivation, and the Intergenerational Transmission of Social Disadvantages—Empirical Evidence from Selected Countries

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Abstract: Based on longitudinal data from the Cross-National Equivalent File 1980–2016 (CNEF 1980–2016) the paper analyzes the extent of income inequality and capability deprivation and the driving forces of the intergenerational transmission of social and economic status of two birth cohorts in Germany, and the United States. In both the countries the empirical results show increasing inequality of the real equivalent household income, and younger cohorts experience a higher persistence of social and economic status. In the United States income inequality is more expressed than in Germany, which is in accordance with lower intergenerational income mobility. The contribution of individual and family background characteristics and capability deprivation indicators to intergenerational income mobility is more pronounced in the United States than in Germany. The significant impact of capability deprivation in childhood on the intergenerational transmission of economic chances emphasizes the importance of economic and social policy designated to guarantee the equality of opportunity.

Keywords: personal income; wealth and their distribution; income inequality; human capital; measurement and analysis of multidimensional poverty; intergenerational mobility

1. Introduction

Many industrialized countries are confronted with changing macroeconomic conditions, institutional settings of the labor markets, and the relative demand for skills which are among the explanations for the continuously increasing inequality of the earnings distributions (Jenkins 2011). Technological and demographic changes reinforce job polarization and heterogeneity of employees concerning age, gender, occupations, and industries contribute to increasing economic and social stratification jeopardizing the equality of opportunity (Acemoglu 2003, Atkinson and Piketty 2010).

The link between income inequality and intergenerational economic and social mobility is complex and non-linear. Empirical research tends to show that income inequality and intergenerational mobility of the social and economic position are correlated (Friedman [1962] 2002), but the causality is ambiguous. The “Great Gatsby Curve” suggests that countries with high income inequality experience less mobility across generations (Corak 2013), but income inequality can also stimulate upward social mobility (Causa and Johannson 2010). Economic and social inequality experienced in childhood gains in importance from a perspective caring about the equality of opportunity (Smeeding and Rainwater 2004). Children growing up in low-income households only escape the poverty trap if intergenerational income mobility compensates economic and social inequality (Mayer and Lopoo 2005). The negative consequences of economically and socially disadvantaged children for the society may be considerable (Gregg and Machin 2001), because children have no personal responsibility for their own economic and social situation, and poverty in childhood often

feeds a vicious circle that implies a higher risk of impoverishment in adulthood (Atkinson et al. 1983; Causa et al. 2009; Corak 2006; Corcoran 2002; Mehrotra 2006; Redmond 2008; Robeyns 2005; Sen 1992). Higher income dispersions suggest that the returns to education benefit those individuals whose investment in education is not constrained by family background (Friedman [1962] 2002).

From a socio-political perspective, the level and the determinants of income inequality and intergenerational social and economic mobility open insights about the effectiveness of policy measures to guarantee equal opportunity (Smeeding and Rainwater 2004). The policy instruments and transfer packages tell a great deal about the working of a country's welfare state regime, defining a complex of legal and organizational properties, the role of the state interacting alongside the market, the civil society and the family in the provision of welfare (Arts and Gelissen 2002; Huber and Stephens 2005; Therborn 1995; De Swaan 1988). Esping-Andersen (1990, 1999) presents a typology of welfare states based upon the dimensions decommodification and social stratification¹ and the private–public mix concerning the relative roles of the state, the family and the market in welfare provision, and clusters democratic industrial societies into liberal, conservative-corporatist, and social democratic regime countries.

Countries with a liberal welfare state regime (United States, Great Britain, Canada, Australia, New Zealand) are characterized by low decommodification and strong individualistic self-reliance. The public philosophy is grounded on the idea of opportunity reflecting individual efforts. A relatively unregulated labor market fosters the creation of low-paid jobs, and large earnings differentials. The labor market policies offer less protection for workers, the state reacts only in case of social failures, the transfers are modest and the rules for entitlement are very strict. The educational system is less standardized, and higher education is privately financed, which suggests ambiguous effects on intergenerational social mobility (Dustmann 2004; Gornick and Meyers 2003). Countries with a conservative-corporatist welfare state regime (Germany, Austria, France, Italy) are typified by a modest level of decommodification. The institutional settings of the labor market and labor market policies ensure employment stability. Government policies ensure against market-based risks and protect those who are unable to succeed in the market place. Benefits and entitlement are often earnings-related, and administered through the employers and geared towards maintaining social patterns. Health care, welfare, social insurance, national assistance, and old age pensions are provided at government expense. Family policies facilitate labor market participation of women and support the transition from traditional male bread-winner model to adult worker model. On the other hand tax policy favors preservation of traditional family role patterns (Lewis 2006). Higher education is publicly provided, the vocation-oriented educational “dual system” (Germany, Austria) relies on occupation-specific credentials, and results in socially stratified and sex segregated outcomes. The social democratic approach to welfare and social policy (Scandinavian countries) is characterized by generous benefits, a commitment to full employment and income protection, and a strongly interventionist state promoting equality through redistributive policy. Social policy aims at maximizing the capacities of individual independence, promoting equality of opportunity for women and men, including the provision of a safety net in case of temporary unemployment.

The paper aims to evaluate the relationship between income inequality and the degree to which the family background conditions in childhood determine the economic and social chances as adults. The paper enlarges the focus by introducing the concept of capability deprivation (Mehrotra 2006; Redmond 2008; Robeyns 2005; Sen 1992). The paper addresses the research questions (i) to what extent income does inequality and capability deprivation in childhood and as adults differ, and (ii) to what extent do family background attributes and capability deprivation indicators determine intergenerational income mobility. The paper analyzes the situation of two birth cohorts in Germany

¹ The dimension ‘decommodification’ refers to the extent to which an individual’s welfare relies upon the market, in terms of pensions, unemployment benefits and sickness insurance. The dimension ‘social stratification’ relates to the role of the welfare state in maintaining or breaking down social stratification.

and the United States. We start from the hypotheses that the link between social stratification and endowment factors works differently according to the existing welfare state regime, institutional settings of the labor market, family role patterns, and social policy, and between age cohorts.

- In Germany, social policy is designed to focus on alleviating social exclusion, and to induce a higher social permeability between generations. Redistributive policy is targeted to lower income inequality and capability deprivation, but these aims could be outperformed by traditional family role models implying a stronger link between generations and a more pronounced influence of individual and parental background characteristics and capability deprivation indicators on socio-economic status as adults.
- In the United States we expect higher income inequality and capability deprivation associated with lower intergenerational income mobility than in Germany. We expect a higher impact of individual and family background characteristics and capability deprivation indicators on intergenerational transmission of social and economic status than in Germany.

The paper is organized in six sections: Section 2 focuses on the theoretical background of income inequality, poverty and multidimensional capability deprivation, and intergenerational mobility of social and economic status, Section 3 reports the data and sample organization, Section 4 outlines the methodology to analyze multidimensional capability deprivation, and the heritage of social and economic status. Section 5 presents the empirical results and Section 6 concludes with a summary of findings and discussion of some stylized facts about the intergenerational heritage of economic and social status to derive policy implications and directions for further research.

2. Theoretical Background

2.1. Income Inequality, Poverty and Capability Deprivation

The change in the overall level of income inequality is an important dimension of the well-being of the population in a country and reflects the functioning of economic and social policy. Income inequality, poverty, social exclusion and capability deprivation are related dynamic processes limiting a person's future prospects. The emphasis on social exclusion and capability deprivation enlarges the focus from income or expenditure to multidimensional disadvantages and from static outcomes to dynamic processes (Burchardt et al. 2002; Gordon et al. 2000; Gordon 2006; Room 1995). Social exclusion and capability deprivation are multi-dimensional phenomenon, affecting both the quality of life of individuals and the equity and cohesion of society as a whole (Atkinson 1998; Levitas et al. 2007). Social exclusion reflects a combination of inter-related factors resulting from a lack of capabilities (Sen 1992, 1999) required to participate in economic and social life (poor skills, labor market exclusion, living in a jobless household), service exclusion (public transport, gas, electricity, water, telephone), exclusion from social relations (common activities, social networks), exclusion from support available in normal times and in times of crisis, exclusion from engagement in political and civic activity, poor housing, high crime environment, disability, health problems, or family breakdown (Saunders et al. 2007; Saunders 2008). Poverty is either discussed as a dimension of (Marlier and Atkinson 2010) or a concept very close to social exclusion. If poverty is understood as encompassing low income situations implying a lack of participation in key activities in social, political, and cultural life (Burchardt et al. 2002; Duffy 1995; Townsend 1979) or inability to do things, that are in some sense considered normal by the society as a whole (Howarth et al. 1998), or insufficiency of different attributes of well-being (e.g., housing, literacy, health, provision of public good, income, etc.), then both the concepts become very close (Bourguignon and Chakravarty 2003). The measurement of social exclusion and deprivation focuses either on indicators or risk factors. The indicators are outcome oriented and define socially excluded respectively deprived persons ex-post, the risk-factors are process-oriented and predict socially excluded respectively deprived persons (Levitas 2000).

The capability approach (Sen 1984, 2009) questions causal effects between income and opportunities and offers a comprehensive multidimensional framework for poverty analysis. It adopts

a multidimensional perspective taking a broad focus on the constraints that may restrict human lives (Atkinson et al. 2002; Wheelan et al. 2010) and shifts from income oriented poverty indicators to capabilities and functionings. ‘Capabilities’ are opportunities that a person could exercise if desired, referring to a person’s real or substantive freedom to achieve ‘Functionings’, which refer to successful ‘doing and being’ of a person, concerning life in the society or health status (Sen 1999, 2009).

The literature provides a broad range of capability dimensions, covering ‘minimum core’ dimensions as life; physical security; health; education and learning; standard of living; productive and valued activities; participation, influence and voice; individual, family and social life; identity, expression, self-respect; and legal security (Burchardt and Vizard 2011), or philosophically-derived central capabilities covering life; bodily health; bodily integrity; senses; imagination and thought; emotions; practical reason; affiliation; other species; play; and control over one’s environment (Nussbaum 2000; Nussbaum 2003), or selective dimensions as quality of work; agency and empowerment; physical safety; the ability to avoid shame; and psychological well-being (Alkire 2007). These dimensions interact with and influence a person’s capability to have access to and to participate in social life of the community, to be successful in the labor market, to be able to choose an appropriate occupation assuring income stability, to cultivate social contacts, or to be able to maintain an adequate living standard (Figari 2012; Hick 2012). According to the capability approach income is viewed as instrumental and contingent for a person’s opportunities (Sen 1984, 2009), and poverty is regarded as a restricted set of essential capabilities a person needs to pursue whatever she values in life (Alkire et al. 2015; Alkire and Santos 2014; Rippin 2016).

2.2. Intergenerational Income Mobility

The analysis of intergenerational income mobility stresses the relation between the income variable of persons in adulthood and the income variable of these persons when living in the parental household in childhood. There are two major theories concerning the mechanisms of the intergenerational transmission of advantages and disadvantages. According to the family resource model it is not a lack of economic resources, but other characteristics of the parents that are correlated with economic status that influence the parental abilities to provide stimulating environments for their children to have economic success. Individual and family related characteristics determine individual economic and social success, e.g., related to the inheritability of traits (innate abilities). Parents influence their children through a hierarchy of ‘circumstances.’ Social connections that facilitate access to education and jobs, family culture and investments that influence skills, beliefs, and motivation, as well as the genetic transmission of abilities, which means a broader definition of equality of opportunity that policy-makers potentially seek to level out. Additionally, environmental factors, which are loosely (social norms, work ethics, attitude towards risk and social networks) or heavily affected by social and economic policy are influential. Typical examples are policies that shape access to human capital accumulation, such as public support for early childhood day care, primary, secondary and tertiary education, as well as redistributive policies that may reduce or raise financial and other barriers to access higher education (Corak 2004; OECD 2010; Roemer 2004). The socio-economic environment and psychosocial conditions when growing up can have important consequences for mental and physical development of the children (Hertzman and Boyce 2010). Parents who are deprived with respect to several capability dimensions more likely fail to provide stimulating environments for the betterment of their children (Mayer 1997).

According to the human capital approach (Becker 1993; Mincer 1974) economic and social status of the parents is transmitted to their children. The structural hypothesis of intergenerational economic and social mobility emphasizes the view that limited parental resources during childhood restrict the social and economic status of children as adults (Blanden et al. 2005; Mayer and Lopoo 2005). Parental investments increase the children’s human capital, which in turn positively affects their earnings capacity (Becker and Tomes 1986; Chadwick and Solon 2002; Mazumder 2005; Solon 1992, 1999), their ability to gain non-labor income, and even their success in the marriage market (Pencavel 1998).

Among the endowment conditions, parental education, employment behavior, occupational choice, family role patterns, as well as social capital environment are of importance (Stevens 1999). At the other side, gaps in the parents' investment abilities impede the economic success of the offspring.

The first generation of studies on intergenerational income mobility (Becker and Tomes 1986) support the hypothesis of non-linearities in intergenerational income dynamics and report an intergenerational elasticity of log income or log earnings of about 0.2 in various industrialized countries indicating that the parental status does not strongly affect the children's economic and social position. Solon (1999) among others showed that the high intergenerational income mobility partly was due to sample selection and transitory fluctuations of the chosen income variables. Using better quality data, more representative samples, multi-year income variables and correcting for measurement errors, the consecutive generations of analyses found empirical evidence of intergenerational income elasticities ranging between 0.20 and 0.60 or even more (Solon 1992, 1999; Chetty et al. 2014, 2014; Gouskova et al. 2010). Cross-country comparisons showed that intergenerational income elasticities are sensitive to different income measures and vary across the income distribution (Landersø and Heckman 2017). Corak and Heisz (1999) and Hertz (2005) found empirical evidence for a roughly S-shaped relationship between parents' and children's incomes, being close to zero for those children with parents at the lower end of the income distribution. The analysis of the dynamics of intergenerational income mobility reveals a decreasing effect of the parental income status on the economic and social position of their children (Corcoran 2002; Mayer and Lopoo 2005; Solon 2004).

3. Data and Sample Selection

The empirical analysis is based on data from the German Socio-Economic Panel (SOEP), and the US Panel Study of Income Dynamics (PSID), which were made available by the Cross-National Equivalent File (CNEF) project at the College of Human Ecology at Cornell University, Ithaca, N.Y.² The PSID started in 1980 and contains a nationally representative unbalanced panel of about 40,000 individuals in the United States. From 1997 on the PSID data are available bi-yearly. The SOEP started in 1984 and contains a representative sample of about 29,000 German individuals that includes households in the former East Germany since 1990 (Wagner et al. 2007). The surveys track the socioeconomic variables of a given household, and each household member is asked detailed questions about age, gender, marital status, educational level, labor market participation, working hours, employment status, occupational position, economic situation of the members of a given family over time, as well as household size and composition. The income variables are measured on an annual basis and refer to the prior calendar year. The data allow monitoring the employment and occupational status, the earnings situation, and the socio-economic characteristics of the individuals.

The data do not provide a sufficiently long time frame to observe parents and children at identical life cycle situations, but cover an adequately long period to allow monitoring socioeconomic characteristics, employment and occupational status, and earnings situation of children living in the parental household and when becoming members of other family units. In this way, the data allow to draw inferences about the effects of being exposed to different life situations in the parental household on the economic and social situation as young adults.

Empirical evidence shows that the strength of socioeconomic heritage depends on the age when family background characteristics are observed. Analyses of the impact of genetic endowment factors on socio-economic status as adults mostly focus on pre-school children (Erola et al. 2016). Empirical analyses of intergenerational income mobility focus on the social and economic situation of school age children and teenagers and as adults (Landersø and Heckman 2017). We considered two cohorts of children aged 10 to 20 years for a great deal of teenagers at this age still live in the parental household

² For a detailed description of the data bases see Frick et al. (2007).

and to avoid the overrepresentation of children staying at home until a late age. The German sample included children born in the years 1986–1990 (cohort 1), respectively 1991–1995 (cohort 2). The US sample included children born in the years 1984–1988 (cohort 1), respectively 1989–1993 (cohort 2). These persons were aged between 28 and 38 years when we observe their social and economic situation in their own households in the periods 2004–2011 respectively 2008–2015 (Germany), and 2001–2009 respectively 2005–2013 (USA). We excluded adults in full-time education, because their income situation differs from the rest of population. In the parental generation we considered persons up to 60 years to avoid a too large bias of retirement.

The data base does not allow identifying parents–children relations exactly, therefore we defined ‘parents’ as adults, whose marital status is ‘married’, or ‘living with partner’ and who are living in households with persons indicated as ‘children.’ We used family (household) identifiers and relationship codes to match sons and daughters to their parents within each data set. We allowed families to contribute as many parent-child pairs to each data set as meet our screening rules: The number of the parent-child pairs equals the number of the children in the parental households. The selection process led to a sample of 4380 (cohort 1) respectively 2768 (cohort 2) persons living in Germany. The US sample covered 4674 (cohort 1) respectively 4830 (cohort 2) women and men.

The paper follows the standard conventions and assumed that income is shared within families and thus household income is arguably a better measure of economic and social status than individual income variables (Mazumder 2005). The study was based on the equivalent post-government household income, which equals the pre-government household income plus household public transfers (social benefits: Dwellings, child or family allowances, unemployment compensation, assistance, and other welfare benefits), plus household social security pensions (age, disability, widowhood), deducting household total family taxes (mandatory social security contributions, income taxes, or mandatory employee contributions). We used referred income variables from the data base, thus the results make no allowance for the bias of imputed values on income inequality and income mobility (Frick and Grabka 2005).

To consider the family structure we calculated the household income per adult equivalent employing the Square Root Scale (OECD 2008, 2011). The household income variables were deflated with the national CPI (2010 = 100) to reflect constant prices. To exclude transitory income shocks and cross-section measurement errors we used moving averages of the real equivalent post-government household income. The parental household socio-economic mapping was captured either by characteristics of the father or the mother. In “double”-parent families the father’s characteristics were employed, in “single”-parents families the characteristics of either the mother or the father were introduced in the analysis.

A major factor that will lead to changes in the quality of mobility data is that response rates tend to decline over time and so the representativeness of mobility tables derived from survey data may worsen. By reason the income variables highly determine survey-attrition we followed Fitzgerald et al. (1998a, 1998b) to construct a set of sample specific weights to address to the non-random sample attrition bias, that do not account for attrition in general, but for attrition among the particular groups under study. We estimated a probit equation that predicts retention in the sample (i.e., being observed as an adult) as a function of pre-determined variables measured during childhood. Presuming that the samples were representative when the children were still children we constructed a set of weights

$$(z, x) = \left[\frac{Pr(A = 0; z, x)}{Pr(A = 0; x)} \right], \quad (1)$$

with x denoting the parental income as primary regressor, and z is a vector of covariates to predict attrition, indicated by $A = 1$. Thus $w(z, x)$ will take higher values for people whose characteristics z make them more likely to exit the panel before their adult income can be measured. The variables considered in z are gender, parental age and educational attainment as well as their squares. We supposed these

variables to affect the attrition propensities, and to be endogenous to the outcome, that is to have an effect on the children's income as adults conditional on parental income. The weights $w(z, x)$ were multiplied with parental household weights, which yields a set of weights that apply to the household of the children as adults. The parental household weights were assumed to capture the attrition effects, the weights, $w(z, x)$, compensate for subsequent non-random attrition.

4. Methodology

4.1. Income Inequality and Capability Deprivation

To evaluate the extent of income inequality we employed inequality measures which differ concerning the sensitivity to changes in the course of the income distribution. The coefficient of variation,

$$CV(y) = \frac{1}{\bar{y}} \left[\frac{1}{n} \sum_{i=1}^n (y_i - \bar{y})^2 \right]^{1/2} = \frac{\sigma_y}{\bar{y}}, \quad (2)$$

captures the relation of the standard deviation of an income variable and its arithmetic mean. A higher value of the coefficient of variation indicates a higher degree of inequality. Generally speaking the Gini coefficient measures v -times the area between the Lorenz curve, which maps the cumulative income share on the vertical axis against the distribution of the population on the horizontal axis, and the line of equal distribution. The easiest mathematical expression is based on the covariance between the income of an individual (y_i) and the rank (F) the individual occupies in the income distribution. The rank takes a value between zero for the poorest and one for the richest. Denoting \bar{y} as the mean income, the Gini coefficient is then defined $Gini(v) = \frac{v \text{cov}(y, F^{v-1})}{\bar{y}}$. Parameter v is used to emphasize various parts of the income distribution, and the higher the weight, the more emphasis is placed on the bottom part of the income distribution. The standard Gini coefficient,

$$Gini(v) = \frac{2 \text{cov}(y, F)}{\bar{y}}, \quad (3)$$

is sensitive to changes around the middle of the income distribution (Green et al. 1994) and ranges from 0 (perfect equality) to 1 (total inequality).

Inequality measures of the Generalized Entropy class $GE(\alpha) = \frac{1}{\alpha^2 - \alpha} \left[\frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\bar{y}} \right)^\alpha - 1 \right]$, are sensitive to changes at the lower end of the income distribution for α close to zero, equally sensitive to changes across the income distribution for α equal to one, known as Theil index (Theil 1967), and sensitive to changes at the upper end of the income distribution for higher values of α . The analysis here employs

$$GE(1) = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \log \frac{y_i}{\bar{y}} \text{ and } GE(2) = \frac{1}{2n\bar{y}^2} \sum_{i=1}^n (y_i - \bar{y})^2, \quad (4)$$

with n the number of persons, y_i the income variable for person i , and \bar{y} the arithmetic mean of the income variable. The higher the value of these inequality measures, the higher the degree of inequality.

To evaluate the degree of capability deprivation in childhood and as adults we employed a modification of the Multidimensional Poverty Index (MPI) developed by Alkire et al. (2017) which follows the functional form of the adjusted headcount ratio (Alkire and Foster 2011) building on FGT-poverty measures (Foster et al. 1984). The MPI is based on a set of indicators, organized into weighted dimensions, in which a person or a household are deprived at the same time by applying a vector of deprivation cutoffs (z) and creating a deprivation matrix which provides a score for each person in each dimension, with 1 if the person is deprived in that indicator, and 0 else. We applied a vector of equal weights ($w_j = 1$), so that each dimension and each indicator within a dimension contributes to overall deprivation in the same way. The poverty profile was summarized in a weighted deprivation score (c_j) indicating relative deprivation in n capability dimensions. If the deprivation score exceeded

the poverty cutoff (k) persons respectively households were considered as multi-dimensionally poor. The censored matrix considers zero values for non-deprived persons. The MPI reports the mean of the weighted matrix, multiplied with the number of indicators it contains. The MPI reflects the relative deprivations of persons, and can be expressed as the product of deprivation incidence and deprivation intensity

$$MPI = HA, \tag{5}$$

with $H = \frac{q}{n}$ the headcount ratio or deprivation incidence, q the number of deprived persons, and A the deprivation intensity, which indicates a person’s average deprivation score value (Alkire et al. 2017).

The data base provided information on the capability dimensions health, education, employment, and income, which are reorganized into seven indicators. The dimension ‘bodily health’ and ‘bodily integrity’ (A) influences the capability to have access to participate in social life. A bad mental or physical health status implies costly medical treatment, might prevent from participating in the labor market, and limit a person’s activities. We operationalized the indicators (1) ‘health condition’ and (2) ‘health impairment’ with the dummy variables ‘health condition’ [1; 5] and ‘satisfaction with health’ [0; 10]. The deprivation threshold of ‘health condition’ is when a person rates her health status satisfactory, bad, or poor (>3). The deprivation cutoff for indicator variable ‘satisfaction with health’ is when the person is considerably dissatisfied with health (<7). The dimension ‘education’ (B) influences other capabilities, such as occupational choice and future income, and the ability to engage in social interaction. This dimension is considered with indicator (3) ‘educational attainment’, based on schooling years. A person with less than 10 years of education is considered deprived according to this indicator. The dimension ‘employment’ (C) covers ‘affiliation’, ‘play’ and ‘control over one’s environment’, these capabilities contribute to household income, self-respect and individual well-being. To capture the deprivation concerning this dimension we used the indicator dummies (4) ‘unemployment status’ (1 not working), and (5) ‘working poor’. A person counts among the ‘working poor’ if his/her labor market work is not appropriately remunerated. Persons with less than 50% of the median earnings are classified to be deprived according to this indicator. The dimension ‘housing’ (D) captures the capabilities ‘affiliation’ and ‘standard of living’, which are necessary in order to be able to participate in the social life of the community. Persons are considered to be deprived according to indicator (6) “satisfaction with life” if their satisfaction with life [0: 10] is below the threshold level “4 dissatisfied”. The dimension ‘income’ (E) covers the capability ‘control over one’s environment’. A person is deprived according to indicator (7) ‘household income’ if her relative income position is equal or lower than the fourth quintile of real equivalent household income (2010 = 100) (Table 1).

Table 1. Capability Dimensions, indicators, and deprivation cut-offs.

Dimension	Capability	Indicators—Variable in the Database	Deprivation Thresholds/Cut-Offs	
A	Health	bodily health	health condition [1 very good; 2 good; 3 satisfactory; 4 poor; 5 bad]; health impairments; satisfaction with health [0; completely dissatisfied 10 completely satisfied]	1 health condition >3 ; 0 else 1 satisfaction with health <7 ; 0 else
B	Education	senses, imagination and thought	educational attainment in years	1 years of education <10 years; 0 else
C	Employment	affiliation, play, control over one’s environment	unemployment status working poor	1 not working; 0 else 1 earnings $<50\%$ median earnings, 0 else
D	Housing	bodily health, affiliation	unacceptable housing, living situation (satisfaction with life 0 completely dissatisfied, 10 completely satisfied)	1 satisfaction with life <7 ; 0 else
E	Income	Control over one’s environment	dissatisfactory income situation	1 household income <4 th quintile of real equivalent household income; 0 else

4.2. Intergenerational Income Mobility

The movement from one income position to another and the factors that influence them are key issues from a welfare point of view (Fields and Ok 1999; Heckman 1981). The most common approach to quantify how economic (dis)advantages are transmitted across generations is to estimate intergenerational income elasticity applying ordinary least squares (OLS) to the regression of the natural logarithm of permanent real equivalent household income (2010 = 100) of person i living in her own household as adult (y_i) on the natural logarithm of permanent real equivalent household income (2010 = 100) of person i living in the parental household (y_p)

$$y_i = \beta_0 + \beta_1 y_p + u_i \quad (6)$$

(Björklund and Jäntti 1997; Couch and Lillard 2004; Grawe 2004; Hertz 2005; Solon 1999). Equation (6) is motivated by economic theory, specifically by the model of Becker and Tomes (1986). A central point is that income mobility across generations and inequality within generations can be understood in a unified way by recognizing that parents both care about and are able to influence the economic and social status of their children. The constant term β_0 represents the change of economic status common to the children's generation. The regression coefficient β_1 captures the statistical relationship that is commonly referred to the intergenerational elasticity (IGE) showing the percentage change in a child's income associated with a percentage change in parental income, and represents the fraction of economic advantage that is on average transmitted across the generations. The larger β_1 the more likely a person will inhabit the same income position as her parents, which implies a greater generational persistence of the relative income position. Depending upon the degree of inequality in parental incomes, small values of β_1 confer substantial advantages to the children's better-off. The closer to zero β_1 , the weaker the relationship between parent and child outcomes, and the greater generational income mobility. The random error component (u_i) is usually assumed to be distributed $N(0, \sigma^2)$ (Antman and McKenzie 2007; Corak 2006; Greene 2018; Wooldridge 2010). To evaluate the cohort effect on intergenerational elasticity, the model in specification (a) includes the variable COH_c (1 cohort 1; 2 cohort 2).

The intergenerational elasticity indicates the average mobility measure but throws not important light on the probabilities of economic success conditional to individual and household characteristics. The extension of Equation (6)

$$y_i = \beta_0 + \beta_1 y_p + \sum_{i=2}^n \beta_i X_i + u_i, \quad (7)$$

includes a set of individual and family background characteristics and capability deprivation indicators, which are supposed to affect the social and economic status of person i (X_i). The children's socio-economic characteristics as adults partly express the indirect effects of parental economic outcome on the children's income: The higher the income of the parents the higher their investments in the education of the children, which in turn upgrades their social and economic status. To the extent that the variables in (X_i) lower (raise) the coefficient β_1 compared to the model specification (7), they "account for" the raw intergenerational income elasticity (Björklund and Jäntti 2009; Hertz 2005; Grawe 2004).

The regression model in specification (b) includes individual and household characteristics in (X_i) of the children's generation as adults, indicated with subscript (c). To capture gender effects we included the variable GEN_c (1 male, 2 female). Additionally, we considered marital status (MAR_c 1 married, living in partnership, 2 single, widowed, divorced, separated) to take account for the effect of the family structure on economic and social mobility. Furthermore, we included the number of children less than 16 years living in the household (CHILDC) to consider in how far household size and care requirements interfere with intergenerational income elasticity. Finally, we introduced occupational status (OCC_c) to capture the impact of a person's social status on intergenerational income elasticity. We reorganized the 2-digit occupational categories in the data base, which are oriented at ISCO-88

(International Standard Classification of Occupations) and included an occupational variable indicating 1 “academic/scientific professions/managers”, 2 “professionals/technicians/associate professionals” occupations, and 3 “trade/personal services”, and “elementary occupations.” There is a distinctive ranking of occupational dimensions: Lower-numbered categories offer a higher prestige and a higher social status. The children’s characteristics reflect the outcome of the parent’s financial investment, but also inherited quality attributes, as personality traits, that contribute to the children’s success in social life and labor market.

The characteristics of the parental household in (X_i) are indicated by subscript (p) and consider that intergenerational income correlation might not really be due to income per se, but to the effects of the social and economic background of the parents. We included the sex of the household head (GEN_p 1 male 2 female) to capture the effect of gender and household organization. We included the age of the household head (AGEHH_p) to control for its effect on the transmission of social and economic status. Additionally, we included the marital status of the household head (MARHH_p 1 married, living in partnership, 2 single parent, widowed, divorced, separated) to take into account to the effect of the family structure in the parental household on economic and social mobility.

To evaluate the impact of capability deprivation in the parental household on intergenerational income mobility the regression model considers a set of indicators in (X_i) . We included the self-rated health condition of the household head (SELF_p 1 health condition >3; 0 else) and the self-rated satisfaction with health of the household head (HEALTH_p 1 satisfaction with health <7; 0 else). Additionally, we include whether the household head respectively his/her partner are deprived with respect to human capital accumulation (EDUHH_p, EDUP_p 1 if education less than 10 years; 0 else). Furthermore, we included dummy variables to capture the capability deprivation of the household head with respect to employment status (EMPHH_p 1 not employed; 0 else), and living situation (SATLIFE_p 1 satisfaction with life <7; 0 else). Finally, the regression model included a dummy variable to consider the capability deprivation of the household head with respect to satisfaction with living standard (SATINC_p), which takes the value 1 if the real equivalent household income (2010 = 100) is lower than at the fourth decile in the distribution. Table 2 presents the description of the variables and descriptive statistics for the pooled cohort samples of each country.

Table 2. Description of the variable, descriptive statistics, pooled samples.

Variables	Description	Germany Mean/% in 1 (SD)	United States Mean/% in 1 (SD)
y_i	In permanent equivalent post-government household income (2010 = 100)	9.8711 (0.4765)	9.9799 (0.4274)
y_p	In permanent equivalent post-government income (2010 = 100), parental household	9.6819 (0.3650)	9.9043 (0.6491)
COH _C	Cohort 1 Cohort 2	0.6128 .3872	0.4918 0.5082
GEN _C	Sex 1 male 2 female	0.4887	0.4489
MAR _C	Marital status 1 married, living in partnership, 2 widowed, divorced, separated	0.5318	0.4982
CHIL _C	Number of children in the household	0.8749 (1.051)	1.2693 (1.277)
OCC _C	Occupation 1 academic/scientific professions/managers, 2 professionals/technicians/associate professionals, 3 trade/personal service, elementary occupations	0.2345 0.3821 0.3834	0.1567 0.2038 0.6395
DEPR _C	Capability deprivation status in adulthood 1 deprived in at least 1 capability dimension; 0 else	0.2461 (0.2403)	0.2340 (0.2502)
SELF _C	Self rated health status 1 satisfactory, poor, bad; 0 else	0.3109	0.4000
HEALTH _C	Dissatisfaction with health, 1 satisfaction <7	0.2792	
EDU _C	Basic education, 1 if education <10 years; 0 else	0.1735	0.0346
EMP _C	Unemployment status, 1 unemployed; 0 else	0.1907	0.1385
LAB _C	Working poor 1 if labor income <50% median earnings; 0 else	0.1791	
SATLIFE _C	dissatisfaction with life 1 if satisfaction with life <7; 0 else	0.2885	0.2332
SATINC _C	dissatisfactory living situation 1 if		
	Household income <4 decile; 0 else	0.3009	0.3640
GENHH _p	Sex household head, 1 male; 2 female	0.9257	0.7522
AGEHH _p	Age of the household head, in years	43.12 (3.578)	40.5343 (6.464)
MARHH _p	Marital status of the household head, 1 married, living in partnership; 2 widowed, divorced, separated	0.8933	0.7355

Table 2. Cont.

Variables	Description	Germany Mean/% in 1 (SD)	United States Mean/% in 1 (SD)
DEPR _p	Capability deprivation parental household 1 deprived in at least 1 capability indicator, 0 else	0.2601 (0.2193)	0.1633 (0.2149)
SELFF _p	Health status household head 1 household head is disabled; 0 else	0.0789	0.1382
HEALTH _p	Dissatisfaction with health, 1 satisfaction <7; 0 else	0.3506	
EDUHH _p	Basic education household head 1 if education <10 years; 0 else	0.2929	0.1329
EDUP _p	Basic education household head's partner, 1 if education <10 years; 0 else	0.4198	0.0521
EMPHH _p	Employment status of the household head 1 unemployed; 0 else	0.0817	0.1253
SATLIFE _p	Dissatisfaction with life 1 if satisfaction with life <7; 0 else	0.2974	
SATINC _p	Dissatisfactory living situation 1 if household income <4 decile; 0 else	0.2992	0.3681
N	Number of observations	7148	9504

Source: SOEP-PSID 1980–2016, author's calculations. Note: The subscripts indicate the parental household characteristics in double parents' families the variable refers to the father, in single parents' households to the father or the mother.

5. Empirical Results

5.1. Income Inequality and Capability Deprivation

Table 3 shows the median real equivalent post-government household income (2010 = 100) and income inequality and capability deprivation patterns for both the age cohorts in Germany and the United States. In both the countries, the median household incomes increased in the life course of the cohorts. The inequality measures reveal higher income dispersion for US cohorts than for German cohorts. In both the countries, inequality measures sensitive to changes in the middle (Gini coefficient), across (GE(1)) as well as at the upper end (GE(2)) of the distribution document increasing social disparities. Persons in cohort 2 experience higher median incomes accompanied by higher income dispersion in the life-course compared to persons in cohort 1, which suggests a higher intergenerational persistence of social and economic status for younger cohorts.

Table 3. Inequality, and capability deprivation—permanent real equivalent household income.

Cohort	GERMANY				USA			
	Cohort 1		Cohort 2		Cohort 1		Cohort 2	
	Childhood	Adulthood	Childhood	Adulthood	Childhood	Adulthood	Childhood	Adulthood
Median	15,464	19,719	16,820	19,642	20,011	23,427	22,308	23,914
Coefficient of Variation	0.3726	0.4475	0.4116	0.5520	0.5386	0.5461	0.3831	0.3391
Gini coefficient	0.1944	0.2377	0.2040	0.2668	0.3399	0.3524	0.3744	0.3835
Theil index = GE(1)	0.0629	0.0927	0.0736	0.1241	0.2043	0.2315	0.3271	0.2778
GE(2)	0.0694	0.0932	0.0847	0.1517	0.2727	0.2988	0.3822	0.4410
Deprivation score	0.2522	0.2410	0.2727	0.2542	0.1810	0.2265	0.1461	0.2414
M ₀ = HA	0.1878	0.1622	0.2173	0.1753	0.0879	0.1356	0.0674	0.1472
Nobs	4380	4380	2768	2768	4674	4674	4830	4830

Source: SOEP-PSID 1980–2016, author's calculations.

The deprivation measures are based on five (United States) and respectively on seven (Germany) indicators. In Germany, capability deprivation does not significantly differ between and within cohorts. Persons in cohort 2 experience a higher mean deprivation score and a higher multidimensional deprivation index (MPI) than persons in cohort 1. Capability deprivation does not significantly change in the life course of both birth cohorts. In the United States, the mean deprivation score as well as the multidimensional deprivation index (MPI) reveal an increasing affliction, incidence and intensity of capability deprivation in the life course of both birth cohorts. The empirical findings might suggest that German redistributive policy is effective to ameliorate the probability to escape the capability deprivation trap. In the United States, income inequality increasingly entails capability deprivation, which might accentuate the countries' different welfare state regimes (Table 3).

5.2. Intergenerational Income Mobility

The results of the regression of the logarithm of the real equivalent post-government household income (2010 = 100) of children on the logarithm of the real equivalent post-government household income of the parents (2010 = 100) for both the birth cohorts in Germany and the United States corroborate the findings of various studies reporting a range of intergenerational income elasticity around 0.4 or even higher (Aaronsen and Mazumder 2008; Becker and Tomes 1986; Chetty et al. 2014, 2014; Lee and Solon 2009; Mayer and Lopoo 2005, 2008; Solon 1992, 1999, 2004). The β_1 coefficient indicates a higher intergenerational mobility of social and economic status in Germany compared to the United States. Cross-country differences in estimated intergenerational income elasticity can arise for a multitude of reasons, ranging from differences of macroeconomic indicators, variations in the composition of income sources, structural differences of income distributions (Landersø and Heckman 2017), or variations of income inequality in the course of the income distribution, amongst others due to racial income disparities in the United States (Chetty et al. 2018; Manduca 2018; Mazumder 2014). Furthermore, country differences of

intergenerational income correlation may partly be due to variations in the welfare benefits, especially with respect to the public support of childcare and education, conditioning social permeability. In Germany, pregnancy-leave policy is generous, there is a wide variety of institutionalized and publicly subsidized childcare, and secondary and tertiary education is publicly provided. In the United States the influence of the factors guaranteeing high intergenerational income mobility obviously are compensated and outperformed by the determinants inducing a higher intergenerational correlation of social and economic status. In both the countries, the cohort effect in the pooled sample significantly lowers raw intergenerational elasticity, younger birth cohorts experience a significantly higher intergenerational persistence of social and economic status. In Germany, intergenerational income elasticity increased from 0.3878 (cohort 1) to 0.4084 (cohort 2), and in the United States even to a higher extent from 0.4327 (cohort 1) to 0.6009 (cohort 2) (Table 4).

The inclusion of a set of individual and family background characteristics and capability deprivation indicators accentuates the country differences. In Germany, these attributes contribute 19.47 percentage points (cohort 1) respectively 22.85 percentage points (cohort 2), and 20.06 percentage points (pooled sample) to the “raw” intergenerational income elasticity. In the United States, these characteristics lower the β_1 coefficient onto a higher extent by 25.09 percentage points to 0.2856 for cohort 1, by 23.81 percentage points to 0.3628 for cohort 2, and by 24.19 percentage points to 0.3280 for the pooled sample. The empirical results corroborate that economic success significantly relates to individual and family background resources. In Germany, social and family policy seems to be more successful to guarantee intergenerational social and economic mobility, though individual and family background related characteristics increasingly gain in importance.

In both the countries, given the parental household income, the household income of the offspring is significantly lower when they are single, widowed or divorced persons, or living in households with children. In Germany, occupational status matters: To be engaged in trade and personal service occupations as well as elementary occupation significantly lowers the “raw” intergenerational income elasticity. In the United States, the significant effect is evident for cohort 2 only.

The results corroborate the hypothesis that parental background plays a major role for economic and social status of their children. In Germany, given the parental household income, the household income of the offspring tends to be lower when living with female, widowed, divorced, or separated household heads in childhood. Limited resources when living in the parental household restrict economic and social chances during childhood and shape social and economic performance as adults. In both the countries, to live with one of or both the parents deprived with respect to health status, education, employment, living conditions significantly increases the intergenerational persistence of social and economic status (Table 5).

Table 4. Intergenerational income mobility.

Model Specification (a)		Germany			USA		
(X _i)	Description	Cohort 1	Cohort 2	Pooled Sample	Cohort 1	Cohort 2	Pooled Sample
y _p	In permanent equivalent post-government income in the parental household	0.3878 ***	0.4084 ***	0.3965 **	0.5327 ***	0.6009 ***	0.5699 ***
COH _c	Cohort 1 Cohort 1 2 Cohort 2			−0.0656 ***			−0.0411 **
constant		6.141 ***	5.8763 ***	6.1729 ***	4.7235 ***	4.0070 ***	4.3495 ***
	R2adj	0.0880	0.0915	0.0855	0.1731	0.2131	0.1940
	RMSE	0.4350	0.4841	0.4556	0.7262	0.7747	0.7518
	LL	−557.03	−1720.36	−1452.56	−1513.73	−1562.17	−1108.08
	Mean VIF	1.51	1.44	1.44	1.74	1.59	1.68
	Nobs	4380	2765	7144	4670	4830	9500

Source: SOEP-PSID 1980–2016, author’s calculations. Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 5. Intergenerational income mobility.

Model Specification (b)		Germany			United States		
(X _i)	Description	Cohort 1	Cohort 2	Pooled Sample	Cohort 1	Cohort 2	Pooled Sample
y _p	In permanent equivalent post-government income in the parental household	0.1931 ***	0.1799 ***	0.1959 ***	0.2856 ***	0.3628 ***	0.3280 ***
COH _c	Cohort 1 Cohort 1 2 Cohort 2			−0.0267 *			0.0173
GEN _c	Gender 1 male 2 female	−0.0233	0.0295	−0.0044	0.0260	0.0116	0.0194
MAR _c	Marital status 1 married 2 widowed, divorced, separated	−0.0808 ***	−0.0638 ***	0.0715 ***	−0.0881 ***	−0.1095 ***	−0.0997 ***
CHIL _c	Children in the household	−0.1366 ***	−0.1620 ***	−0.1465 ***	−0.1390 ***	−0.1246 ***	−0.1309 ***
OCC _c	Occupational status 1 academic/scientific professions/managers, 2 professionals/technicians/associate professionals, 3 trade/personal service, elementary occupations	−0.0335 ***	−0.0267 ***	−0.0312 ***	−0.0056	−0.0156 *	−0.0057
GENHH _p	Gender household head 1 male 2 female	−0.0097	−0.1066 *	−0.0444	−0.0341	−0.0609	0.0486
AGEHH _p	Age household head, in years	0.0001	0.0023	0.0013	0.0026	0.0019	0.0025 *
MARHH _p	Marital status household head 1 married 2 widowed, divorced, separated	0.0072	−0.0513 ***	−0.0183 *	−0.0107	−0.0073	0.0012

Table 5. Cont.

Model Specification (b)		Germany			United States		
(X _i)	Description	Cohort 1	Cohort 2	Pooled Sample	Cohort 1	Cohort 2	Pooled Sample
SELFF _P	health status household head parental household 1 disabled, 0 else	0.0442	−0.1632 ***	−0.0826 ***	−0.00734 *	−0.0823 ***	−0.0004
HEALTH _P	Dissatisfaction with health household head parental household 1 satisfaction <7, 0 else	−0.0678 ***	0.0235	−0.0441 ***			
EDUHH _P	Basic education household head parental household 1 if education <10 years, 0 else	−0.0321	−0.1182 ***	−0.0588 ***	−0.1349 ***	0.0643	−0.1023 ***
EDUP _P	Basic education household head's partner parental household 1 if education <10 years, 0 else	−0.0264	−0.0724 ***	−0.0447 ***	0.0003	−0.1189 ***	−0.1492 ***
EMPHH _P	Unemployment household head parental household 1 unemployed, 0 else	0.0176	−0.1460 ***	−0.0613 ***	−0.1772 ***	0.0098	0.0963 ***
SATLIFE _P	Dissatisfaction with life household head in the parental household 1 satisfaction <7, 0 else	−0.0759 ***	−0.0636 ***	−0.0651 ***			
SATINC _P	Dissatisfactory living situation in the parental household 1 household income <4th decile, 0 else	−0.0303	−0.0110	−0.0198	−0.0270	0.0372	0.0356
constant		8.4696 ***	8.5970 ***	8.4618 ***	7.6381 ***	6.9786 ***	7.2871 ***
	R2adj	0.1969	0.2438	0.2080	0.2640	0.3015	0.2811
	RMSE	0.3755	0.4038	0.3889	0.6168	0.6162	0.6176
	LL	−324.39	−999.34	−1241.29	−1228.39	−1369.49	−721.16
	Mean VIF	1.51	1.44	1.44	1.74	1.59	1.68
	Nobs	4380	2765	7144	4670	4830	9500

Source: SOEP-PSID 1980–2016, author's calculations. Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

6. Conclusions

In an era of widespread concern about growing income inequality, it seems appropriate to analyze how individual and family background characteristics and capability deprivation in childhood works on the intergenerational income mobility. Based on representative CNEF data the paper evaluates the level and extent of income inequality, capability deprivation, and intergenerational income mobility of two birth cohorts living in the parental household at the age of 10–20 years and living in their own household as adults in Germany and the United States. We started from the hypotheses that country differences concerning the existing welfare-state regime, family role patterns, institutional settings of the labor markets, and social policy design induce a different working of the individual and parental socio-economic resources on income inequality, capability deprivation, and intergenerational income mobility. The empirical findings partly support these hypotheses, and indicate blurring boundaries between the welfare state systems:

- Inequality equality measures sensitive to changes at different parts in the income distribution reveal higher income inequality in the United States compared to Germany. In both the countries, the empirical findings reveal increasing income inequality in the life course, and younger birth cohorts are confronted with higher income dispersion.
- Whereas both the German birth cohorts experience a decreasing affliction, incidence and intensity of capability deprivation in the life course, in the United States capability deprivation increases. In Germany, economic and social framework obviously supports a sufficient allocation of resources to escape the capability deprivation trap in the life-course.
- The negative correlation between income inequality and income mobility suggests a higher intergenerational mobility of economic status in Germany compared to the United States. In fact, the results show higher intergenerational income elasticities in the United States, which contradicts the hypothesis of a mobile society, and a high permeability of the social system. In Germany, macroeconomic conditions, institutional settings of the labor markets, as well as redistributive and income support policies (OECD 2010) are successful to induce intergenerational social mobility.
- The results report country differences concerning the impact of individual and family background characteristics, and capability deprivation indicators on intergenerational income mobility. In Germany, these variables lower the raw intergenerational income elasticity for both birth cohorts by about 20 percentage points, in the United States to a higher extent. Though traditional role models have become less binding (Corak 2006) the results corroborate that parental investments in children may have different payoffs (Blanden et al. 2005, 2007; Mayer and Lopoo 2005). In both the countries, capability deprivation in childhood significantly increases the probability to be affected by intergenerational persistence of social and economic status. Younger birth cohorts experience lower intergenerational income mobility.

Individual well-being, and the integration into the economic, social and political framework of a society are essential targets of economic and social policy in a country. In view of the significant impact of individual and family background characteristics and capability deprivation indicators on intergenerational income mobility, the results suggests that social and economic policy is challenged to conceptualize effective measures to provide support and opportunities essential for a person's favourable economic and social development, and especially to recognize the importance of capability resources to be means to break the intergenerational transmission of social and economic disadvantages. However, the empirical results call for further research of mechanisms how families, labor markets and social policy interact in determining the intergenerational transmission of economic and social (dis-)advantages and to derive policy measures to remove the barriers to the equality of opportunities.

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