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Astrid Krenz

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La Distinction reloaded: Returns to Education, Family Background, Cultural and Social Capital in Germany

Astrid Krenz, *University of Göttingen* ∗

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Abstract
The German educational system finds itself being criticized by the OECD in its Programme for International Student Assessment. Family background would heavily influence children's academic achievements. A child stemming from a high class family has a 3.1 times higher chance to go to secondary school than a child from a working class family, controlling for ability. The chance for taking up university studies is even 7.4 times higher for children from high class families. In search of an explanation for this misery Pierre Bourdieu's and James Coleman's theories about cultural and social capital prove to be valuable. Based on their work this study will investigate returns to education and its interdependence with family background in Germany. Bourdieu basically explains that family background leads to acquire specific levels of manners, attitudes, self assurance etc. which in turn might influence job status, income e.g. A huge body of literature measuring returns to education all over the world already exists, however, studies for Germany, and in particular studies that focuss on the relation between income, education and social background, are rare. This study appears to be the first one following an interdisciplinary approach, incorporating measures of cultural and social capital along with family background and further variables into a common Mincer wage equation. Taking data from the German SOEP for the years 2001 and 2005 indices measuring cultural and social capital are constructed applying principal component analysis. Education, ability, motivation, cultural and social capital are endogenized and adequate regression techniques are applied. It can be shown that social background determines an individual's amount of education which in turn will influence income. An individual's amount of education does significantly depend on parents' education, the father being a low-skilled laborer, the amount of cultural and social capital, ability and motivation. Males do get more education than women. Educational policy in Germany should concentrate on enhancing access to education for children from low class families on the one hand, on the other hand the German society should be sensitized to special needs of individuals stemming from low class families as well as to problems that these humans do face.

Keywords: Returns to Education, Cultural Capital, Social Capital, Inequality, Index Construction
JEL-Code: I21, J24, J31, Z13

∗ Astrid Krenz, Universität Göttingen, Wirtschaftswissenschaftliche Fakultät, Platz der Göttinger Sieben 3, 37073 Göttingen, Germany, EMail: astrid.krenz@wiwi.uni-goettingen.de

1 Introduction

Recently, problems in the German educational system made the headlines. The OECD's Programme for International Student Assessment (PISA)[1] found out that family background heavily influences children's academic achievements in Germany. Parents' job status and education influence children's results in Math, Natural Sciences and Reading. The German Government talks in its poverty review 2005 about a strong relationship between education, social background and migration status. A child stemming from a high-class family has a 3.1 times higher chance to get a positive recommendation for a university track secondary school than a child from a low-class family controlling for both cognitive and reading abilities. The chance for taking up university studies is even 7.4 higher for children stemming from high-class families. Low-class children are still underrepresented at German universities, although their number has risen slightly since 1973, at least a little success resulting from the late sixties' actions for educational expansion. But still the data uncover a miserable situation[2]: from 100 kids of families where the father is non-academic only 36 attend university track secondary schools and 11 move on to universities, but from families where the father is an academic 85 attend university track secondary schools and finally 81 move on to university.

Ralf Dahrendorf (1965), a popular German activist supporting educational expansion during the 60s, explains this situation as follows: low-class families face both financial and motivational problems. Direct and indirect costs (on the one hand costs of studying and living, on the other hand costs resulting from retarding earning income) preclude low-class kids from taking up university studies. Further, university education seems strange and surreal to low-class families. This is because low-class families do only have limited access to gather information on how to get access to university and secondary school and why only a university education will make certain jobs accessible.

A problem of the German educational system is that it restricts chances for higher education at an early stage of age: at the age of 10 children will either attend a university track secondary school (the Gymnasium) or another school intending to prepare them for vocational training (Realschule, Hauptschule). It might well be that social background, and therewith predetermined characteristics of the child, determine what kind of schooling recommendation the kid actually gets. An alter-

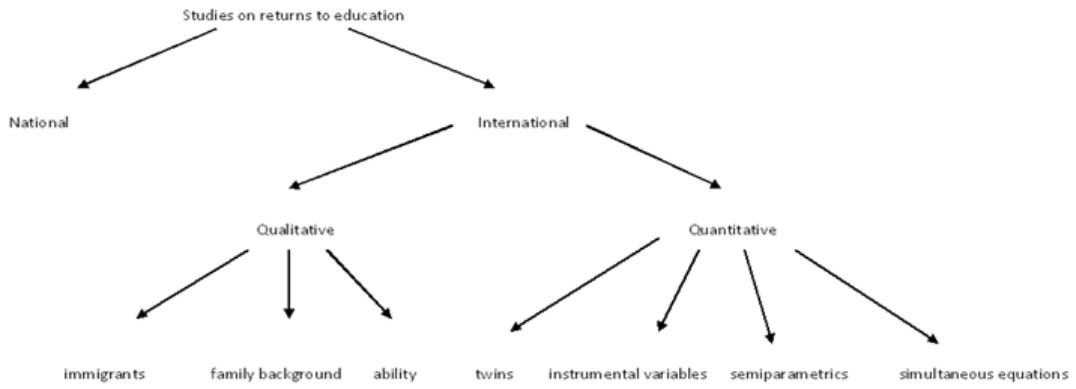
[1] Socioeconomic background's influence on academic achievements in Germany was detected in PISA 2000, PISA 2003 and PISA 2006, as well.

[2] Based on the results given in the 2nd poverty review of the German government. Results of the 3rd poverty review show that 46 out of 100 kids from families where the father is non-academic go to university track secondary schools and 23 take up university studies whereas 88 children from families having an academic father will go to university track secondary schools and 83 take up university studies. Compared to 2003, the chance for taking up university studies thus increased up to 3.6 for low-class kids in Germany.

native is given by an integrated, less popular type of school (Gesamtschule), offering ways to either university or vocational training.
Children having a migrational background face special problems in Germany. It's basically problems with the German language which in turn will result in lower academic achievements. Chances for these kids to get a recommendation for a university track secondary school are 1.7 times less than for German kids controlling for same reading abilities and social background.
Apart from this, educational expansion in Germany is also being criticized (see Hartmann and Kopp (2001)). Due to educational expansion workers would be overqualified. Because of this, other factors like the amount of cultural and social capital gained with family background would influence not only education but also job position and earnings.
This study investigates how returns to education in Germany vary with social background. As we will see in the following, there are hardly any studies about Germany and returns to education depending on family background, thus justifying a thorough investigation. Further, variables of social and cultural capital will be included in regressions. Therefore, adequate measures have to be constructed making use of the theories of Pierre Bourdieu and James S. Coleman. We will see that in Germany, where you are coming from determines your education and earnings. Further, social and cultural capital, as described by Bourdieu and Coleman, determine an individual's education and earnings. Germany describes itself as being a meritocratic society. But, if not the most intelligent and motivated people get the highest education, but those with a favorable family background, no matter if they are less intelligent and motivated, the value of meritocracy is mistaken.

2 Previous Research

The following graphic illustrates the variety of existing studies on returns to education.



Aside from differentiating between national and international studies one could divide the existing literature into qualitative studies, focussing on certain explanatory factors on the other hand, and quantitative studies on the other hand, those mainly concentrating on advances in econometric estimation procedures.

Only a few studies exist for Germany. In most of these few studies family background is not being controlled for and none of them take cultural or social capital into account. Robert Skarupke (2005) uses panel data estimation, he does not consider family background, cultural or social capital as explanatory factors for income. His estimates for returns to education range between 7 and 15 percent exhibiting slight differences between men and women. Isabel and Reinhold Schnabel (2002) find out that family background is important for explaining income. Returns to education for the whole sample and for the sample of low-class children range between 6 and 7 percent, for kids from high-class families they are about 3 to 4 percent. Cornelissen, Jirjahn and Tsertsvadze (2008) find out that returns to education in Germany depend on family background. They first estimate an equation addressing an individual's schooling, in a second step they estimate a wage equation, using OLS. Their results show that father's education and managerial position influence an individual's level of education. Higher mother's occupational status influences an individual's level of education positively but the individual's earnings negatively. Introducing interaction effects the authors find out that the parents having a higher job position reduces the influence of parents' education on the individual's level of schooling. The authors explain this by parents' possibly stronger social networks, financial background or family values. Their estimate for returns to education is about 10 percent. Heineck and Riphahn (2009) investigate in what way educational attainment is related to family background in Germany. They employ multinominal logit estimation. Their results show that educational opportunities for children from low-class families did not improve for over 25 years (based on SOEP data taken from 2003). They also refer to a strand of literature which reveals that achieved levels of education do not purely base on ability in Germany, but on other factors like family background.

Qualitative studies on measuring returns to education can be divided into studies on immigrants, family background's influence on income and cognitive abilities. Studies on immigrants bring to the light that duration of stay in the new country (Chiswick (1978), Bratsberg and Ragan (2002)), command of the new country's language (Chiswick and Miller (2002), Bratsberg and Ragan (2002)), country of birth (Chiswick and Miller (2002), Bratsberg and Ragan (2002)) and education received in the new country (Bratsberg and Ragan (2002)) significantly influence income. Immigrants earn less in the beginning, Chiswick and Hurst (2000) deliver an expla-

nation for this: immigrants would accept a lower income because they have fewer information about the labor market. Employers would pay fewer income because there is uncertainty about immigrants' skills.

Family background is investigated by Patrinos (1995), Papanicolaou and Psacharopoulos (1979), Cohn and Kiker (1986), Armitage and Sabot (1987), Dearden (1999), Hauser (1973) and Shea (2000), for example. While Patrinos finds out a positive influence of family background on income for Greece, Papanicolaou and Psacharopoulos detect a negative one for Great Britain, and Cohn and Kiker's study shows no significant influence for the US, at all. Armitage and Sabot provide the following explanation: schooling and other investments into human capital (this might be learning how to behave in society) might be complementary goods in poorer countries but substitutes in rich countries. Because of this, returns to education decrease with family background in richer countries and increase with other factors (according to Bourdieu and Coleman via cultural and social capital) but in poorer countries education causes quite high returns. Lorraine Dearden (1999) shows for the UK that education and social class of the father, financial situation of the family and mother's interest into academic achievements of the child are important for explaining income. Hauser (1973) points to the fact that children from socially advantaged families would experience higher academic abilities, more motivation and better support by their parents, teachers etc., which enables them to benefit more from education. His estimates for returns to education are about 9 percent as is common in the US literature. Shea (2000) found out that only in families that have a less educated father family's income influences child's income and education. Oliver Deschenes (2007) shows for the US that family background influences both a man's education and earnings. Men having better educated fathers have higher marginal returns to schooling whereas those having better educated mothers have lower returns to schooling. The author explains this by father's education being associated with higher benefits per year of education while mother's education is associated with lower costs, increasing education levels but lowering returns.

The literature on ability on the one hand addresses the question what kind of relationship exists between ability, education and income. On the other hand the question what kind of bias for returns to education will occur when ability is omitted needs to be clarified. The literature basically talks about an upward bias when omitting ability, the influence of education on income would thus be overestimated (Regan, Burghardt, Oaxaca (2006), Card (1999), Griffin (1976), Hause (1972), Tobias (2003)). Cognitive abilities of a person are only difficult to measure, which is because there is less accordance in what constitutes a person's ability and because there exist no good measures that might capture the various dimensions of ability (for example intelligence, creativity, cleverness etc.) (see Checchi (2006), Regan, Burghardt and Oaxaca (2006)). Besides, ability will be influenced by social

environment, which makes it difficult to separate genetic inheritance from external factors (Regan, Burghardt, Oaxaca (2006), Checchi (2006), Hause (1971)). IQ tests would not only measure intelligence but also what is learned in life, so far. Also, Becker (1962) and Rosen (1973) point to a positive influence of cognitive abilities on both education and income. Card (2001), Regan, Burghardt and Oaxaca (2006) and Hause (1971, 1972) detect a positive influence of ability on education, therewith pointing to endogeneity inherent in the variable education.

Quantitative studies can be divided into twin studies, studies employing instrumental variables, studies using semiparametric methods and multiple equation models. Twin studies are quite popular. This is because there is accordance in that observing identical, monozygotic twins, cognitive abilities and family background can be controlled for, since it is assumed that these kids got the same abilities by genetic inheritance and grew up under the same conditions (Ashenfelter and Krueger (1994), Siebert (1985)). Thus, it can be assured that a correlation between education and income does not result from a correlation between education and ability or between education and family background. The same might be assumed for non-twin siblings. Fixed effects estimators are used in this kind of literature. This way the positive bias induced by omitting variables (for example ability) can be eliminated. But, a higher measurement error might occur such that FE-estimators are smaller than OLS-estimators (Card (1994)). Important studies are given by Ashenfelter and Rouse (1998), Behrman and Rosenzweig (1999), Rouse (1999), Ashenfelter and Krueger (1994), Ashenfelter and Zimmermann (1997) and Neumark (1999). Neumark addresses the questionable assumption that education is the same among twins. Ability might not only be genetic but also influenced by external factors such that there might as well be differences in ability among twins. An instrumental variable estimator could thus be quite high because of this bias, even higher than FE- or GLS-estimators.
Instrumental variables are used when OLS-estimators are assumed to be biased because of measurement errors. Studies on returns to education mainly address measurement error in the variable schooling. Either the interviewed individuals give wrong answers about their level of education or the variable education does not adequately measure education. Measurement errors–there is accordance on this in the literature–bias OLS-estimates of returns to education downwards (Regan, Burghardt, Oaxaca (2006), Card (1999)). Since the plim of the IV-estimator is not influenced by measurement errors in the variable schooling, the IV-estimator will be larger than the OLS-estimator (Ichino, Winter-Ebmer (1999), Card (2001)). An instrumental variable has to be found for the variable that causes measurement errors. The IV has to be highly correlated with this variable but asymptotically uncorrelated with the other variables influencing income. Only this way a consistent

estimator can be gained for returns to education. In most of the studies the IVs for schooling were quarter of birth, tuition fees, proximity to school or the number of compulsory schooling years (Kling (2001), Ichino and Winter-Ebmer (1999), Card (2001), Card (1999), Card (1994)). IV-estimation is also used in twin-studies. This is because of the complementarity between bias due to omitting ability and due to measurement error in education. In twin-studies controlling for ability means that the estimators for returns to education will be even more strongly biased downwards when measurement bias in education is prevalent. This is why IV-estimators are strongly needed, controlling for measurement errors, getting more valid results. Only a few studies use semiparametric methods for estimating returns to education. There is a lot of potential for doing future research. Semiparametric methods allow for a more flexible estimation of parameters. This is important when endogenous and exogenous variables are related in a nonlinear manner to each other. Tobias (2003) found out that there is a nonlinear relation between ability and income which varies with education. Because of the way variation deviates it would not be possible to just include a simple interaction term between ability and education into regression equations. It can be shown that individuals without college education have decreasing returns to ability and those with college education have increasing returns. A simple linear regression would have underestimated returns for the most intelligent individuals with college education and the less intelligent individuals without college education.

Further, there are only a few studies which use simultaneous equation frameworks. Using this method important variables can be endogenized, interdependencies can thus be detected. Griffin (1976) and Kiker and Condon (1981) specify recursive models. Griffin argues that education influences income only together with ability and social background, not without them. This means that education is neither able to free young people from their social situation nor to explain differences in income. Returns to education would be overestimated by 35-40 percent if ability and family background were not included in regressions. Kiker and Condon found out that education will be directly influenced by family background (father's education and job status are significant) and indirectly by a likely transmission of both motivation and intelligence. Regarding an individual's income, parents' income, education, motivation and intelligence are significant.

I do have to criticize both Griffin and Kiker and Condon for just using recursive estimation frameworks thus establishing only one-sided relationships between endogenous variables. One has to wonder for example why income is just being influenced but does not influence other variables, in turn. I assume that in the literature efforts were about to make specification and estimation processes as simple as possible, such that in recursive models OLS could be used, which leads to consistent (and because there are no lagged endogenous variables), unbiased, asymptotic normally

distributed, efficient estimates.

3 Theoretical Background

3.1 Returns to Education

Measuring returns to education reaches back to Gary Becker's human capital theory. There, the assumption of homogeneity and full replaceability of workers is withdrawn and discrimination is allowed for. The basic thought behind this is that individuals are heterogenous, having different skills. During their lives individuals invest in their human capital which delivers different labor productivities in the future, leading to different incomes and ways of career. Investments that increase human capital are school education, extension studies, better health systems or migration (Schultz (1962)). Labor productivity not only depends on former investments into human capital but also on the individual's skills and motivation (Becker (1962)). Assuming that the individual is acting rationally like a *homo oeconomicus*, the individual is going to invest into his human capital as long as the present value of expected future additional returns is still bigger than the present value of actual costs, or saying it differently, the individual is going to invest into his human capital to maximize his welfare (Becker and Chiswick (1966)). Costs will comprise both direct costs of education (tuition fees, costs of living) and costs of foregone income during period of education (opportunity costs). Human capital theory is being criticized for it does not consider further explanatory factors of income like social background, quality of school, gender, race, religion, luck, social contacts, intelligence, belonging to firm, ambition, motivation, region, unemployment and health [3]. Measurement of human capital can be done in three ways, either by looking at years of education, by addressing costs to years of education or by focussing on returns. In most of the studies regressions are carried out and the coefficient in front of the variable education is interpreted as measuring the return to education. In theory the present value of life income differences is taken (Mincer (1974), Becker (1975), Becker (1962)). Therefore, average yearly income is regressed on age and education. Then, the periodical income differences based on different levels of education are calculated and discounted to the present by using a capital market interest rate. Jacob Mincer specified and estimated a wage equation that is being used in most of the studies on measuring returns to education, so far. The same will be done here, incorporating some adjustments and further enhancements.

[3] Theories offering different explanations for how income is being generated focuss mainly on asymmetric information of both suppliers and demanders of labor and can be divided into discrimination, screening and radical theories.

3.2 What we can learn from Bourdieu and Coleman

3.2.1 The theory

Bourdieu and Coleman heavily criticize the discipline of Economics, especially for its notion of capital and measuring returns to education. Bourdieu says that in Economics capital reduces to exchange of goods, profit maximization and people focussing on their own advantage (Bourdieu (1983)). All other forms of social exchange would thus be non-economic neglecting people's own advantage. According to Bourdieu three forms of capital should be considered: economic, cultural and social capital. Concerning human capital theory Bourdieu criticizes that only monetary aspects of schooling investments are taken into account. He argues that transmission of cultural capital within families would affect returns to education, as well. Economists would look at skills and intelligence but they ignore that these qualities are a product of investments into time and cultural capital. Furthermore, the schooling degree would depend on family's social capital.
Coleman criticizes the strict distinction of individuals' actions between Sociology and Economics. Sociology would make a mistake in attributing no own motivation for activity to the individual but only regards him as being influenced by external factors (Coleman (1988)). Economics on the other hand would not consider the social context in which the individual operates, nor social norms, trust and distrust between human beings. Coleman advocates a combination of both Economic and Sociological theories. Social capital would serve as a tool for combination. Rational and aim-oriented actions included into social context would deliver better results on both individual and groups' activities.
According to Bourdieu cultural capital takes on three forms: it exists in the person itself, in cultural goods like paintings, books, instruments, machines, and in institutional form (degrees e.g.). Incorporated cultural capital needs time for acquisition and can only be adopted by the person himself. Duration of education may be an adequate measure for this, but only if this type of education also includes education received at home, by the family. Education can increase or decrease the amount of cultural capital, on the one hand as an established advantage on the other hand as double lost time (first, not learning what is required, second, time needed to correct for mistakes). Incorporated capital belongs to the person himself, it is what is known as his *habitus*. The *habitus* is influenced by society (family and others), it is not attributed by genes thus not hereditary, it rather depends on experiences, which the individual gathers by ways of perception, thinking and acting. Different forms of *habitus* result in different valuations and preferences which show up in different types of life style. This is easy to be detected through ways of diet, music, cars, literature, living conditions, sports, etc. Cultural capital is always dependent on its first acquisition and can be identified by assessing an individual's way of speaking

which will be typical for a particular class or region. An individual can only acquire cultural capital as long as his family supports him financially. Cultural capital in form of objects can be given to other people but it remains related to the individual's incorporated cultural capital because, for example, it is not worthwhile possessing a musical instrument without knowing how to play it. Institutionalized cultural capital is represented by degrees. Degrees will warrantee recognition and reputation and symbolize convertibility between cultural and economical capital.
According to Bourdieu social capital can be understood as the entirety of actual and potential resources, which exist within a net of institutionalized relationships of mutual knowing and valuing, i.e. belonging to a group. Coleman says that social capital exists in relationships between individuals and can ease special actions. As Bourdieu points out the amount of social capital depends on an individual's own network of relationships, as well as on the amount of economic, social and cultural capital of the individual's acquaintances. Thus, the different forms of capital are dependent on each other! To make the relationships endure, one has to put continuous work into them. Coleman counts to social capital obligations, expectations, trust, information channels, norms and sanctions. Social capital would exist in the family and also outside of it. The family's societal surroundings would be influenced by financial, social and human capital (the last of which means parents' education or their own cultural capital). Social capital comprises time and efforts spent by parents, grandparents, aunts and uncles on intellectual tasks (doing homework or studying together with the child). Social capital in the family would be very important for the child's intellectual development. It is no worth if parents are highly educated but do not devote themselves to their children and thus do not transfer their ability or knowledge. Less educated parents spending more time with their children would be offering better possibilities for development to their children. Thus, a special effect of social capital is that it is forming human capital of the next generation. There exists a complementary relation between parents' human capital and an individual's social capital. Social capital outside of the family exists in social relations of different parents to each other and to institutions of society. As Bourdieu says belonging to a group leads to attain material or symbolic profits. The return of work for making up or cherishing social capital is bigger the bigger is the current amount of social capital. This is because having a popular name, for example, means you do not have to spend too much effort for being known any more, either most of the people yet know you or they would really love to get to know you. Institutions that ease making up social contacts are rallies, cruises, hunts, proms and receptions, or special living areas, schools, clubs or sports, board games or ceremonies. The other forms of capital can be transformed in each other via economic capital and time.

3.2.2 Empirical evidence

Several studies exist on testing the influence of family background, social and cultural capital on academic or pre-school achievements.
Hartmann and Kopp (2001) show for the years 1955-1985 for Germany that Ph.D. graduates stemming from high-class families are much more likely to attain high management positions in the German economy. Only 9.3 percent of graduates stemming from low-class families made it into high job positions, from high-class families it's 13.2 and from the highest class families it's 19 percent. The authors explain that educational expansion in recent years in Germany made education at secondary schools and doing a Ph.D. more easily accessible for children from low-class families but there is a social exclusion persistent on who is taken for high management positions. The last decision on whom to take would depend on social background. Social background would influence the individual's personal characteristics, knowing how to dress up and how to talk, general education and knowledge, managerial thinking, and self-assurance in acting and behavior. This is something that could not be learned later in life. People stemming from low-class families thus would be more unconfident and it would be easy to figure them out by their way of acting and behavior. The authors further explain that those knowing that they have their family helping them out in bad situations could act and behave in a more relaxed and confident way. Finally, personnel managers would take the applicant that comes closer to their own attitude, thus someone who is more confident.
Some studies yield highly interesting results on family background's influence on early child's development. Murnane, Maynard and Ohls (1981) show for the US that mother's education is influencing a 3-6 year old child's language test results positively. Time that mother spends together with her child is more important than material things available at home. Parcel and Menaghan (1994) show for the US that parents' working conditions influence family's social capital, which in turn influences the child's development. Dependent variables are a child's vocabulary and his behavior. Mother's intelligence, grandmother's and father's schooling results and material situation in the parents' house (quantity and quality of things that could stimulate the child cognitively, warmth of mother-child relationship) influence the child's language skills. Further, mother's and father's job significantly influence a child's cognitive development. This is because the type of work forms the parents' intellect and thus determines their way of raising up their children. Parents that conduct a complex job (which means they have high autonomy and bear a lot responsibility) exert less control on their kids and show more warmth and belonging to them and punish them less. This again will positively influence the child's acting, cognition, competence, self-confidence and motivation. Father's unemployment or an unsure job situation lead to abnormalities in the child's behavior. This might

be because the father usually appears to be a role model and makes up norms for the child which might be less fulfilled when the father is in a critical job position. Ermisch and Francesconi (2001) show for the UK that schooling results of children depend positively on parents' education. Mother's education is more important than father's one. Children stemming from low income families and those having many siblings or just one parent show lower academic achievements.
Further, there exist studies that want to disentangle the importance of cultural and social capital on children's achievements. Diewald and Schupp (2004) show for Germany that cultural and social capital in the family influence the child's amount of social and cultural capital. The relationship to the mother is very important. Father's unemployment influences the child's cultural and social capital negatively. Mother's education and parents' working time are less important. Parents' income and job status are not important, at all. Teachman (1987) shows for the US that learning conditions at home influence children's academic achievements. This means seize of apartment or house, availability of books, encyclopedias, daily papers etc. are important for the child's schooling results, in this sense cultural capital in form of objects. Teachman, Paasch and Carver (1997) find out that social capital (measured as relation between child and parents, parents and school and between different parents), income and education of parents influence the child dropping out from school in the US. Income interacts most heavily with social capital. Possessing more social capital increases the positive effect of parents' income on their child not dropping out of school. Büchel and Duncan (1998) find out for Germany that father's socialization with friends, relatives and neighbors leads to the child being less likely to attend a university track secondary school. Income and education of parents positively influence a child attending a university track secondary school. Further, there is a positive relationship between the father doing sports and the child going on to a university track secondary school. Mother's education is more important for boys than for girls. Socialization and doing sports of the father are only significant in families with low income, education of mother and father only in families with high income. Mother's social activities have no or only strange influences on the child attending secondary school. Katsillis and Rubinson (1990) find out for Greece that it's reasons in society that determine the relevance of cultural capital for academic achievements. These reasons would differ from country to country. In Greece, family background influences cultural capital but cultural capital does not influence academic achievements. Family background determines academic achievements via ability and motivation.

4 Empirical Analysis

4.1 Data

Data are taken from the German Socioeconomic Panel (SOEP). The SOEP is an annual survey in Germany conducted by the German Institute for Economic Research (DIW) in Berlin since 1984. Over time some of the individuals in the survey got lost, for example by death or divorce, but also some new individuals were incorporated for refreshment into the sample. The data represent about 0.02 percent of the German population.
Data will be taken from the waves 2001 and 2005. For these years data exist for about 11000 households and 22000 persons. First, a balanced panel was constructed getting data for individuals for both 2001 and 2005. Matching the data for 2001 and 2005 data are gained from 16740 persons. From this sample those that earn less than or just 500 Euros per month were discarded. This is important in order not to influence the income generating process by those earning just a little by conducting mini-jobs or getting transfers which is way different from regular full or part time employments. Thus, only 6157 persons are left. Further, only those who were partially or fully employed in 2001 and 2005, were kept in the sample. Those being unemployed, ill, retired, interns or trainees etc. were dropped. In order to prevent having too many dummy variables, persons not mentioning their level of education, job status, attendance of cultural events, sports activities, practising arts or doing voluntary work were discarded from the sample. This way only a few data got lost. Only data for the sample of 25-65 year-olds and 25-34 year-olds were kept. Thus, the whole sample consists of 5303 people for 2001 and 5502 for 2005, for the sample of young individuals there are 1300 people for 2001 and 838 for 2005.

4.2 Variable Selection

As Checchi (2006) says, there is more than education that influences income. She talks about education of parents, characteristics of the child, quality of school and discrimination. Keeping this in mind we are prepared to extend investigations on returns to education following an interdisciplinary approach.
For measuring wages monthly gross labor market income (labeled $LABGRO$) in Euros is taken from the SOEP. The SOEP didn't offer variables for hourly or weekly wages. Thus, taking $LABGRO$ has been the best choice. This measure has been operationalized in that the harmonized consumers' price index by the Deutsche Bundesbank was taken to deflationize the measure to the base year 2001. As in Mincer's work the measure was logarithmized. Since only partial and full time employment will be taken into account and the unemployed are discarded from the sample there is also no need to take hourly or weekly wage as is done in Ashenfelter and Rouse

(1998), Ashenfelter and Zimmerman (1997) or Ashenfelter and Krueger (1994), for example.
Education is taken up in the income equation (see Mincer (1974), Card (1994), Heckman and Polachek (1974), Hause (1972), Becker (1962)). Overall, it could be verified that better or more education leads to receive higher income. Education is measured as years of education. The SOEP presents the following division:

	Years of education
Schooling	
no degree	7
lower school degree	9
intermediary school	10
degree for a professional college	12
high school degree	13
other	10
Additional occupational training (includes universities)	
apprenticeship or civil servants apprenticeship	1.5
technical schools (including health)	2
higher technical college	3
universtiy degree	5

Table 1: Years of education

Thus, education takes on the values 7 (no degree) to 18 (school and university degree).
Also, job experience is taken up (see Mincer, Card (1994), Heckman and Polachek (1974), Hause (1972), Hauser (1973)). Job experience is an individual's further investment into human capital. A higher job experience increases income (Hauser (1973)). But with time passing by, returns on job experience diminish, thus a quadratic term should be further used for regression. Its coefficient should bear a negative sign. Job experience is modeled by *age minus education minus 6*.
More intelligent people usually get higher education (Siebert (1985), Griffin (1976), Kiker and Condon (1981)). Further, ability would influence income directly (Kiker and Condon (1981), Griffin (1976), Dearden (1999), Becker (1962)). The SOEP does not provide any direct measure of ability[4]. Instead of this, data on grades in

[4]Lately, kind of an intelligence test is done with only a small part of the individuals included in the SOEP's sample. Data points are still too few to base substantial regression analysis on them.

German, Math and the first foreign language were taken to construct a measure that is likely to address what ability of a person is alike. This procedure is justified by the literature talking about potential employers figuring out applicants' abilities by taking a look on school reports (see Hause (1971), Hause (1972)). The data were operationalized in that *very good* will be assigned 6 points. For the simultaneous equation model the first principal component of the three grades was taken to construct an index, this is going to be explained in greater detail in chapter 4.3.
Motivation will influence income positively (Kiker and Condon (1981), Weisbrod (1972)). But Weisbrod (1972) points to the fact that motivation is likely to be correlated with ability, schooling and family background. Achievement motivation might be learned during early childhood and formed by upbringing (Kiker and Condon (1981)). Now, if motivation influences ability and schooling but is not taken up for regression, then schooling and ability would correlate with each other, although they do not interact with each other in reality (Weisbrod (1972)). Motivation will be modeled here by taking *importance of success in job*. This is a measure taken from 2004 which was matched to the sample. 4 points are allotted to the value *very important*[5].
With the theories of cultural and social capital by Bourdieu and Coleman, effects of family background on returns to education can be explained. Bourdieu and Coleman explained that family background determines cultural and social capital, which in turn influence schooling achievements (Katsillis and Rubinson (1990)). This way at least an indirect influence of social background via education on income can be expected. Social and cultural capital having a direct effect on income is what Hartmann and Kopp give a hint to. Getting a high-paid job would depend on equivalence of *habitus* between applicant and personnel manager. Knowing about how to dress up and how to behave, self-assurance in acting and behavior, and good general education and knowledge are the dimensions of cultural and social capital that are important getting the high-paid job (Hartmann and Kopp (2001)).
Cultural capital can be measured by doing music, dancing, theater, reading (Diewald and Schupp (2004)) or visiting theater, readings, museums, galleries, etc. (Katsillis and Rubinson (1990)). *Visiting cultural events* and *doing arts* are the variables that are taken from the SOEP. 4 points are given for practising these activities *every week*. An index was formed by principal component analysis as is explained in chapter 4.3.
Social capital is operationalized in Diewald and Schupp (2004) as an index of variables measuring being spokesman of school or of class. From the SOEP the variables

But in the future, research should make use of this new variable, representing a way more adequate measure for mapping intelligence than taking grades.

[5]The SOEP didn't offer any other adequate measures for motivation. It would be advisable for future research to construct an index consisting of competence, autonomy, social comparison, fear and risk aversion for example, which is the procedure done in Kiker and Condon (1981).

doing voluntary work and *sports* were taken. The two variables are assigned 4 points when activities are done *every week*. An index is formed using principal component analysis as is explained in chapter 4.3. In a former version of this study also the variable *disputes with parents at the age of 15* has been included for index construction. 0 points have been allotted to having disputes *very often*. The idea behind was that the relationship to the parents is very important for the child's formation of social capital (see Diewald and Schupp). But the results arising from principal component analysis employing the 3 variables were quite surprising: quarreling with parents *very often* would lead to a high index value for social capital, indicating that having more disputes with parents would lead to higher amounts of social capital. Since this is in contrast to former reasoning about the parents-child relationship in relation to social capital formation, the index for social capital has been constructed using *doing voluntary work* and *doing sports* only.

Further variables are controlled for: gender (1=male), job status (1=full employment) and life and work in West or East Germany (1=West). Migration status is modeled by a value of 1 if a person moved to Germany after 1948. It is expected that women do still earn less than men, people in the East less than those in the West, immigrants less than Germans (Chiswick (1978)) and partially employed less than fully employed. For reasons of meeting the identification criteria family status (married=1) is only controlled for in the motivation and social capital equation, health status only in the motivation equation. There, health status is modeled as a variable ranging from 0 to 5, with 5 indicating *very good* health. Size of firm was also controlled for like it is done in Dearden (1999), having a dummy for firms with fewer than 20 workers, between 200 and 2000 workers, more than 2000 workers, being self-employed and a dummy variable for missing values. Base variable was firms with 20 to 200 workers. In smaller companies the employees have fewer bargaining power such that the wage might be lower than in bigger companies. An individual's job status was measured by civil servant, low-skilled laborer, self-employed and being a clerk as base variable. Job status is also taken up by Griffin (1976) or Dearden (1999), for example. It is assumed that low-skilled laborers and civil servants earn less than clerks and self-employed in the free economy.

Family background is important for early child's development (Parcel and Menaghan (1994)), school education and attained schooling achievements (Teachman, Paasch and Carver (1997), Murnane, Maynard, Ohls (1981), Kiker and Condon (1981)) and for income (Dearden (1999), Checchi (2006), Shea (2000), Hauser (1973), Griffin (1976)). Having parents with low education level, low income (see Shea (2000)) or low job status might result in fewer earnings. Parents' education would be important because education will thus be valued by the family, cultural stimuli exist, homework can be supervised and better schools can be chosen (Checchi (2006)). Further, these parents possess better social networks which might be important for

the child's future job search. I will operationalize family background by using several measures namely job status and education of both father and mother. Job status comprises being a low-skilled laborer, self-employed, civil servant and a dummy variable for missing values. Base variable is being a clerk. Regarding education also a dummy variable for missing values was included. However, a first simple OLS regression revealed that none of the variables representing family background exert a significant influence on income. Thus, keeping track of the identification issue, family background was taken out of the simultaneous regression framework again since all of the family background's influence goes via education.

A simultaneous equation model can account for potential endogeneity of variables. Here, besides the extended Mincer wage equation, education, ability, motivation, cultural and social capital will be taken up as dependent, endogenous variables of the system. In the following, explanatory factors for each of these dependent variables shall be derived from the literature.
Several studies found out that education depends positively on ability (Rosen (1973), Tobias (2003), Regan, Burghardt, Oaxaca (2006), Hause (1972), Card (1994), Ichino, Winter-Ebmer (1999)), family background (Ashenfelter and Rouse (1998), Dearden (1999), Griffin (1976), Coleman (1988)), cultural and social capital (Bourdieu (1983), Teachman, Paasch and Carver (1997), Dearden (1999)) and motivation (Kiker and Condon (1981)). In order to meet the identification criteria only father's job status and parents' education were taken up for regression. Further, differences for immigrants, gender and people in the East of Germany shall be investigated.
Ability is likely to be influenced by family background (Griffin (1976), Kiker and Condon (1981)). For guaranteeing identification, this time only mother's education and job status were taken, which is justified by Ermisch and Francesconi who pointed out that mother's education is more important than father's one. Higher education may influence cognition positively but this can only be assumed. According to Weisbrod motivation shall be taken up for regression. Gender will be further controlled for. Cultural and social capital are taken up because they are assumed to exert an influence on ability. Using these types of capital, that is doing music or possessing good social networks, may influence cognition positively, positive influences of playing a musical instrument, for example, are commonly known.
Motivation might be positively influenced by family background (Meece, Pintrich, Schunk (2008)). For reasons of identification only father's job status is controlled for. This is justified by Parcel and Menaghan whose results point to the father being important for the child's behavior, potentially setting up norms, being a role model. Weisbrod (1972) says that ability might have an impact on motivation. It is further assumed that motivation depends on education, the direction of influence is unknown, however. Differences between immigrants and Germans, people in the

East and in the West, marital status and health status shall be further investigated. It is likely that income influences motivation positively, somebody who earns more might gain higher achievement motivation. Cultural and social capital might have a positive effect on motivation, for example the joy of watching a theater play or many stable relationships to other people.
Cultural and social capital will be influenced by family background (Bourdieu and Coleman, Katsillis and Rubinson (1990), Hartmann and Kopp (2001)). To guarantee identification mother's education has been left out of regressions. Further, education is assumed to influence cultural capital positively. Gender differences shall be investigated including a dummy variable into the regression equation. Cultural and social capital will depend on each other (Bourdieu (1983)). As Bourdieu (1983) says, via economic capital the other types of capital can be transformed in each other, thus income influences both social and cultural capital. Social capital is further assumed to be influenced by job status. This is because being in a good job position might make it easier to gain profitable contacts than it is for a low-skilled laborer. Marital status is assumed to influence social capital. It is expected that those being married can build up more social networks than those being alone or widowed. Ability might be in a positive relationship with cultural capital. It might be that intelligent people will find it easier to overview how much cultural capital they miss and how to build it up (because they did not receive it by family background).

4.3 Getting a measure for Cultural and Social Capital

Principal component analysis will be used for constructing indices for cultural capital, social capital and ability. Principal component analysis is able to reduce dimensions of data. Contrary to just averaging variables' values, this method delivers a linear combination taking into account each variable's own variance attributing different weights to each variable.
Individuals not giving answers to *grades attained* were discarded from the sample. Thus, for the whole sample there were 1514 persons left for 2001 and 1580 for 2005, for the sample of young individuals 356 persons were left for 2001 and 239 for 2005. Only the results for the first principal component will be discussed in the following.

	2001	**2001 cohort of 25-34 year-old**	**2005**	**2005 cohort of 25-34 year-old**
First principal component *grades*				
Grade German	-0.581	0.53	-0.581	0.536
Grade Math	-0.562	0.616	-0.559	0.599
Grade First Foreign Language	-0.589	0.583	-0.591	0.595
Explained variance	0.6225	0.6138	0.6189	0.5414
First principal component *cultural capital*				
Visiting cultural events	0.352	0.436	0.278	0.266
Arts activities	0.936	0.9	0.96	0.964
Explained variance	0.7276	0.7258	0.7271	0.7402
First principal component *social capital*				
Sports activities	0.937	0.976	0.918	0.905
Voluntary work	0.348	0.217	0.397	0.426
Explained variance	0.6484	0.6907	0.6288	0.6783

Table 2: Results principal component analysis

The first principal component of the variables grades in German, Math and First Foreign Language forms kind of an average value. For the whole sample in 2001 and 2005 this means that an individual attains a high index value, if (since centered variables' values were taken for analysis) his grades are below the average of grades in German, Math and First Foreign Language. Most of the weight lies on First Foreign Language. For the sample of young individuals the signs for the first component are just the opposite. This means that an individual will attain a high index value if he achieved better grades than the average. Most of the weight lies on grades in Math. There exist almost no differences for the years 2001 and 2005.
Regarding cultural and social capital the first principal components are also kind of average values. People practising a lot of arts or visiting a lot of cultural events will attain a high index value. Also, people doing a lot of sports or voluntary work will score high index values. Practising arts and doing sports get most of the weight. Remarkably, variance of visiting cultural events for young individuals in 2005 is less than for young individuals in 2001. Committing voluntary work on the other hand varies more for young people in 2005 than in 2001.
The indices are gained by composing a linear combination of the first principal component and the centered data points. Actually, there should be as many principal components taken for index construction as the explained variance is not yet larger

than a certain value. In the Statistics' literature, a value of 0.75 is common. Here, almost always more than one principal component would be necessary, only for cultural capital an adequate index could be formed by making use of just one principal component. Since a unique measure is needed for the following analysis, just one index using the first principal component was composed for each of the quantities of cultural and social capital and ability. In the literature scientists don't even explain how much of the variance is being explained by their principal component and how many components are needed for index construction, they just take the first principal component (see for example Katsillis and Rubinson (1990) or Tobias (2003)).

4.4 Descriptive Results and Estimation Outputs

Taking a look at the correlation matrix first, it becomes evident that an individual's and his parents' education correlate positively with each other. Further, there exists a negative relationship between the father being a low-skilled laborer and an individual's education. The same is true for an individual's income and his father being a low-skilled laborer. Correlation between father's and mother's education is strong (this phenomenon is being known as marital selection).

	lninc	**educ**	**educfa**	**educmo**	**falowsk**	**faselfem**	**facivils**
lninc							
educ	0.08						
educfa	0.13	0.25					
educmo	0.08	0.2	0.54				
falowsk	-0.18	-0.2	-0.4	-0.26			
faselfem	0.06	-0.02	0.02	0.02	-0.38		
facivils	0.11	0.11	0.24	0.11	-0.33	-0.11	

Table 3: Correlation matrix

By estimating a simple Mincer wage equation including job experience, results show that returns to education are about 6-7 percent. The young realize lower returns than the 25-65-year-olds. For the young in 2005 job experience is insignificant.

	2001	**2001 cohort of 25-34 year-old**	**2005**	**2005 cohort of 25-34 year-old**
const	7.19** (0.056)	6.7** (0.161)	6.577** (0.057)	6.693** (0.219)
education	0.07** (0.003)	0.069** (0.007)	0.072** (0.003)	0.062** (0.007)
job experience	0.02** (0.004)	0.1** (0.019)	0.0175** (0.004)	0.004 (0.031)
$jobexperience^2$	-0.0003** (0.0001)	-0.003** (0.001)	-0.0003** (0.0001)	0.001 (0.001)
R^2	0.117	0.084	0.13	0.091

Table 4: Estimation results Mincer wage equation

Testing the assumptions of the model revealed that homoskedasticity of error terms is violated such that for example weighted least squares should be better applied. Error terms are normally distributed, however. Multicollinearity is evident for job experience and squared job experience. Ridge Regression would be a remedial procedure. But in the following we will focuss on estimation of our simultaneous equation model.

A simultaneous equation model has to meet the following assumptions. The matrix X of independent and lagged dependent variables should contain only deterministic quantities, further, X should have full rank of columns. This can be verified. Further, it has to be that E(ut)=0. This assumption demands that all important variables have been taken up for regression, which is difficult to test for and can just be assumed to be valid. A further assumption is that error terms are homoskedastic and not autocorrelated. For remedying homoskedasticity White se's have been taken. They yield consistent estimates even if error terms are homoskedastic. Autocorrelation of error terms can be tested by Durbin-Watson-statistics. A value of 0 indicates positive autocorrelation, a value of 4 negative autocorrelation of first order. Identification is another important issue. It addresses the question whether it is possible to attribute unique values to the parameters of the model. If this is not the case, then parameter estimation is senseless, because equations of the model can not be separated from each other. The model used in this study is identifiable with the criteria of the amount of zero restrictions and the rank condition met. The rank condition delivers a sufficient criterion for identification. Since there are 6 equations in the model, the value to compare with is equal to 5. The model is overidentified. This will be important for choosing an adequate estimation method.

	Amount of zero restrictions	**Rank**
Equation		
Income	14	6
Education	18	6
Grades	22	8
Motivation	20	6
Cultural capital	16	6
Social capital	17	7

Table 5: Results of test on identification

One has to decide on estimation methods for single equations or multiple equations on the one hand and between methods employing every a-priori information or just a few, on the other hand. OLS is delivering the best adequacy. But contrary to OLS, the methods 2SLS, 3SLS and FIML are consistent. 3SLS and FIML have higher asymptotic efficiency than TSLS. FIML can control for every a-priori information. TSLS seems to be the adequate estimation procedure in this regression framework since it cannot be confirmed that the model is perfectly specified what is needed for employing multiple equation estimation methods.
Estimation outputs are shown for the year 2005, only. Other outputs can be found in the appendix.

	Dependent variables					
Independent variables	**lninc**	**educ**	**grades**	**motiv**	**cultcap**	**soccap**
const	5.869**	12.388**	-4.092**	0.372	-1.075	-1.426*
lninc				0.195**	0.095	0.157*
educ	0.067**		0.188**	0.066**	0.041	
grades	0.04	1.796**		0.066	0.022	
motiv	-0.066	-0.55	0.544**			
cultcap	0.023	0.936*	-0.265*	-0.153		1.041**
soccap	0.073	1.372**	-0.166*	-0.177*	0.356**	
jobexp	0.027**					
jobexpsqr	-0.0003**					
educfa		0.149**			0.001	0.006
deducfa		1.493**			-0.113	0.164
educmo		0.075	0.036			
deducmo		0.487	0.468			
falowsk		-0.886**		0.121**	-0.125	0.196**
facivils		-0.032		-0.027	0.168	-0.166
faselfem		-0.213		-0.009	-0.038	0.07
dfa		-0.651**		0.048	-0.055	0.145
molowsk			-0.052		-0.026	0.015
mocivils			-0.157		-0.094	0.35
moselfem			-0.405**		-0.145	0.263
dmo			-0.225**		-0.021	0.04
lowsk	-0.158**					-0.142
civils	-0.121**					0.114
selfem	0.152					-0.075
firmsz20	-0.11**					
firmsz200-2000	0.076**					
firmsz2000	0.105**					
firmszselfem	-0.377**					
dfirmsz	-0.062					
gender	0.322**	0.955**	-0.44**		-0.206**	
maritalsta				-0.132**		0.04
health				0.112**		
immigr	-0.062	0.673*		-0.088		
parttime	0.523**					
west	0.289**	0.155		0.011		
R^2	0.491	0.304	0.132	0.051	0.081	0.076

Table 6: TSLS estimates for 2005

For the whole sample in 2005 the income and education equation seem to be adequately specified, exhibiting an R^2 of 0.491 and 0.304, respectively. In the income equation the variables ability, motivation, cultural and social capital are not signif-

icant. On the one hand this could mean that there is indeed no influence of these variables evident on the other hand it might also be that the first principal components used for constructing the indexes for ability and cultural and social capital are not adequate, or that importance of success in job does not measure motivation adequately. Education is highly significant, returns to education are about 6.7 percent which means that one additional year of education leads to an increase of income of about 6.7 percent. Job experience, job status and firm size are significant and bear the expected signs except for job status and firm size of self-employed. Job status of self-employed is not significant, as regards firm size the self-employed can expect to receive fewer income than those working in firms with 20 to 200 employees. Low-skilled laborers, civil servants and those working in smaller firms get fewer income. Low-skilled workers will get a 15.8 percent lower income than clerks, civil servants a 12.1 percent lower income. Men earn more than women, the coefficient is about 0.322 which means that men earn about 32.2 percent more than women. Migration status is not significant. People in the West of Germany earn about 28.9 percent more than those in the East of Germany and those doing full time work earn about 52.3 percent more than those doing only part time jobs.

In the education equation the variables ability, cultural and social capital are significant. But ability does not bear the expected sign. The positive sign would mean that those having worse grades get more education in Germany. This deserves further investigation in future research. Cultural and social capital bear a positive sign. Individuals having more cultural and social capital get more education. An individual's education depends positively on father's education and negatively on the father being a low-skilled laborer. Men get more education than women and immigrants get more education than Germans.

In the ability equation the variables education, motivation, cultural and social capital are significant. One has to pay attention when interpreting regression results. Higher values of the ability index mean that an individual has fewer ability or worse grades at school. Thus, coefficients for education and motivation do not bear the expected signs. The positive signs would indicate that higher amounts of education and motivation decrease ability. On the other hand, this might deserve further investigation in research, as well. Coefficients for cultural and social capital appear to be plausible. Higher amounts of cultural and social capital lead to higher ability. Further, the mother being self-employed positively influences an individual's ability. The coefficient for gender is significant and indicates that men attain better grades in school.

In the motivation equation the variables income, education and social capital are

significant. Higher income and higher education both increase motivation. The coefficient for social capital does not bear the expected sign. Individuals possessing more social capital would thus have lower achievement motivation. The father being a low-skilled laborer exerts a positive influence on motivation. Being healthy is positively influencing motivation whereas being married is influencing motivation negatively, indicating that family is more important than success in job for those being married.

In the equation for cultural capital the variable social capital is significant. More social capital can increase cultural capital. Family background is not significant. Women seem to possess more cultural capital.
In the social capital equation income and cultural capital are significant. Thus, Bourdieu's theory about mutual dependence of cultural and social capital is confirmed. Higher income can help to increase the amount of social capital. Further, the father being a low-skilled laborer influences social capital positively.

	Dependent variables					
Independent variables	**lninc**	**educ**	**grades**	**motiv**	**cultcap**	**soccap**
const	5.806**	14.525**	2.759*	0.939	1.281	-0.759
lninc				0.254	-0.076	0.075
educ	0.079**		-0.145**	0.001	0.095	
grades	-0.089	-1.538**		-0.026	-0.468	
motiv	-0.034	-1.899**	-0.084			
cultcap	0.132	1.633**	0.089	-0.182		0.284
soccap	-0.052	0.833**	0.337*	0.144	0.342	
jobexp	-0.012					
jobexpsqr	0.002					
educfa		0.379**			-0.174**	0.022
deducfa		3.122*			-1.988**	0.482
educmo		-0.023	-0.104			
deducmo		1.06	-1.116*			
falowsk		-0.482		0.015	-0.446**	-0.152
facivils		-0.076		-0.135	0.082	0.192
faselfem		-0.785		-0.215	-0.625	0.387
dfa		0.252		-0.084	-0.49*	-0.028
molowsk			0.171		0.218	0.278
mocivils			0.243		-0.158	0.38
moselfem			0.357		0.491	-0.04
dmo			0.409**		0.293	-0.289
lowsk	0.079					0.13
civils	-0.237**					0.171
selfem	-0.086					-0.217
firmsz20	-0.05					
firmsz200-2000	0.138*					
firmsz2000	0.12**					
firmszselfem	-0.027					
dfirmsz	-0.272					
gender	0.204**	1.083**	0.314**		-0.131	
maritalsta				-0.063		-0.204
health				0.101*		
immigr	-0.19*	0.684		0.091		
parttime	0.531**					
west	0.245**	0.682**		-0.011		
R^2	0.369	0.396	0.187	0.048	0.14	0.084

Table 7: TSLS estimates for the cohort of 25-34 year old in 2005

For the young the income equation is less adequately specified than it is for the whole sample. The education, ability, cultural and social capital equation, however, have a better fit than do the equations for the whole sample. Returns to education

are a bit higher than for the whole sample, ranging about 7.9 percent, which means that one additional year of education results in a 7.9 percent higher income. Job experience is not significant. Civil servants earn about 23.7 percent less than clerks, individuals working in big firms earn more. Men earn about 20.4 percent more than women, full-time employed about 53.1 percent more than part-time employed and those in the West of Germany earn about 24.5 percent more than those in the East. Migration status is significant at the 10 percent level, migrants earn about 19 percent less than Germans.

In the education equation the variables ability, motivation, cultural and social capital are significant. Again, like in the whole sample, the coefficient of the variable ability points to the fact that those having better grades will attain less education. A higher amount of cultural and social capital influences education positively. The coefficient of the variable motivation constitutes that those valuing importance of job success will attain lower education. Father's education positively influences an individual's education. Young men and individuals in the West of Germany attain higher education.

In the ability equation the variables motivation and cultural capital are not significant. Education is significant but the coefficient would suggest that more education will influence cognition or grades negatively. More social capital positively influences ability. Young men get better grades than young women.

In the motivation equation only health status is significant. The equation seems to be not adequately specified. Cultural capital is influenced by family background. Surprisingly, father's education negatively influences cultural capital. The father being a low-skilled laborer exerts a negative influence on an individual's amount of cultural capital. The social capital equation shows up no significant coefficients at all and thus seems to be not adequately specified.

For 2001 there are some differences worthwhile noting. For both the whole sample and the sample of young individuals the coefficient of returns to education is not significant. Investigations revealed that an individual's job status is so important in this year that it heavily reduces importance of education for explaining income. Discarding job status from the regression equation, returns to education are about 18 percent for the young, for the whole sample education still remains insignificant. For the whole sample the following results hold: men get about 37.3 percent more income than women, full-time employed get about 67 percent more income than part-time employed and those in the West about 28.6 percent more income than those in the East of Germany. Mother's education is in contrast to the results of

the year 2005 important for both an individuals' education and ability. But coefficients do not bear the expected sign. This way it would mean that having a better educated mother an individual would attain lower education and worse grades. The father being a low-skilled laborer lead to the individual having lower education, men receive more education than women. Migration status is not important, neither for income nor for education. Social capital does not influence ability as is the case in 2005. Job status influences an individual's social capital.
For the young gender and migration status are not important for explaining income. Full-time employed get a 77.4 percent higher income, people in the West of Germany a 15.5 percent higher income. Mother's education is important for both education and ability. But again, as is the case for the whole sample in 2001, coefficients do not bear the expected sign. Men get more education than women. Social capital and living in West or East Germany are not important for an individuals' education. Further, there is no influence of social capital on ability. Having a mother being a civil servant positively influences ability. Income, education, social capital and the father being a low-skilled worker or self-employed influence motivation. Social capital, however, does not bear the expected sign. The father being a low-skilled laborer goes hand in hand with a higher valuation of importance of job success, the father being self-employed results in lower motivation. Cultural and social capital influence each other. Further, parents' job status influences social capital. Social capital thus is higher, if the father is being a civil servant or the mother being self-employed. Migration status is not important for both income and education.

5 Concluding Remarks

This study revealed the strong influence that family background exerts on education in Germany. Social background in Germany determines an individual's income indirectly via education. Education of parents and the father being a low-skilled laborer influence the child's education significantly. German educational policy should focuss on easing access to education for young people stemming from low-class families. The recent introduction of tuition fees for university studies might be an insuperable barrier for young persons stemming from low-class families, precluding them from taking up university studies. This is because these young people might get neither mental nor financial support from their family. What is needed for is a special type of financial support, for example in form of scholarships for high-potential students stemming from low-class families! The recent decision of the German government to introduce a new program on scholarships might not adequately address the special need of intelligent individuals stemming from low-class families. Under the new scholarship program those individuals having a favorable family background and thus having attained higher levels of education or social and cultural capital would

get the scholarships.
The amount of social and cultural capital and thus the equipment of the parents' house significantly influences ability, education and motivation. A person's cultural and social capital, in turn, significantly depends on family background. Further, cultural and social capital influence each other lending support to Bourdieu's theory. Educational policy's task should be to provide opportunities for children stemming from low-class families to gather cultural and social capital via education at school. This could be achieved by visiting cultural events like theater performances, concerts, art exhibitions or museums, by offering courses in gathering a good general education or learning how to behave in society or by motivating participation in workshops and club activities on various topics and in diverse branches. It is important that access to this kind of activities is free of charge because individuals stemming from low-class families will not be able to spend a lot of money for this. Further, attending all-day schools (free of charge) might ease the process of attaining higher levels of cultural and social capital.
The cohort of young individuals reveals that family background and cultural and social capital still determine an individual's level of education. Thus, socialization by his family influences an individual's way to education and future career. Over the past years, German educational policy didn't manage to ease access to education for everyone, independently of family background.
Another interesting result is that men get higher education than women. This might be because women still decide on traditional roles starting a family instead of attaining the highest education. Educational policy should further support women in pursuing higher education.
In addition, the analysis revealed that women and people in the East of Germany still earn less.
Since social background influences the attained level of education in Germany enormously, politicians should urgently check for social compatibility of policy objectives and outcomes before implementing new educational reforms.

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Appendix

	Dependent variables					
Independent variables	**lninc**	**educ**	**grades**	**motiv**	**cultcap**	**soccap**
const	7.801**	12.874**	-5.128**	0.208	-1.512*	-1.455*
lninc				0.254**	0.08	0.212**
educ	0.029		0.18**	0.044**	0.043	
grades	0.141	2.689**		0.173*	0.054	
motiv	-0.354**	0.04	0.657**			
cultcap	0.107	1.42**	-0.531**	-0.065		0.677**
soccap	-0.021	0.988**	0.004	-0.196**	0.467**	
jobexp	0.03**					
jobexpsqr	-0.0005**					
educfa		0.101			0.035	-0.016
deducfa		1.07			0.274	-0.144
educmo		-0.176*	0.107**			
deducmo		-1.862*	1.036**			
falowsk		-0.812**		0.128**	-0.067	0.089
facivils		-0.06		-0.039	0.127	-0.061
faselfem		-0.162		0.014	0.055	-0.01
dfa		-0.434*		0.036	-0.046	0.091
molowsk			0.087		-0.009	-0.028
mocivils			-0.112		-0.15	0.209
moselfem			-0.277**		-0.15	0.311
dmo			0.00005		0.0002**	-0.0004**
lowsk	-0.217**					-0.229*
civils	-0.148*					0.339**
selfem	0.253**					-0.271**
firmsz20	-0.154**					
firmsz200-2000	0.078					
firmsz2000	0.079*					
firmszselfem	-0.207					
dfirmsz	-0.147**					
gender	0.373**	1.16**	-0.507**		-0.233**	
maritalsta				-0.121**		0.038
health				0.048**		
immigr	-0.07	0.288		-0.108		
parttime	0.67**					
west	0.286**	0.612		0.067		
R^2	0.538	0.357	0.127	0.051	0.11	0.092

Table 8: TSLS estimates 2001

	Dependent variables					
Independent variables	**lninc**	**educ**	**grades**	**motiv**	**cultcap**	**soccap**
const	4.737**	6.093**	2.742**	-0.077	0.74	-2.931*
lninc				0.303**	-0.052	0.319*
educ	0.142		-0.109**	0.055*	0.065	
grades	0.075	-0.888*		-0.093	-0.278	
motiv	-0.13	1.311*	0.041			
cultcap	0.018	3.321**	0.263	0.046		0.835**
soccap	0.03	-0.465	-0.171	-0.205**	0.497**	
jobexp	0.147**					
jobexpsqr	-0.004**					
educfa		0.498**			-0.091*	0.01
deducfa		5.098**			-1.331**	0.822
educmo		-0.323**	-0.195**			
deducmo		-2.532*	-1.625**			
falowsk		0.133		0.214**	-0.411**	0.294
facivils		0.418		-0.111	-0.268	0.429**
faselfem		0.805		-0.234*	0.093	-0.234
dfa		0.748*		-0.025	-0.06	-0.492*
molowsk			0.148		0.11	0.237
mocivils			0.471**		0.008	0.115
moselfem			0.43		-0.583	1.153**
dmo			0.183		0.089	0.189
lowsk	0.038					-0.204
civils	-0.274**					0.112
selfem	0.316*					-0.115
firmsz20	0.054					
firmsz200-2000	0.104					
firmsz2000	0.157**					
firmszselfem	-0.657**					
dfirmsz	0.15					
gender	0.176	0.756**	0.402**		-0.082	
maritalsta				-0.097		-0.229
health				0.028		
immigr	-0.046	0.187		-0.044		
parttime	0.774**					
west	0.155**	0.264		-0.128		
R^2	0.527	0.466	0.167	0.086	0.216	0.168

Table 9: TSLS estimates for the cohort of 25-34 year old in 2001

List of variables

Variables' abbreviations	
const	constant
lninc	logarithm of income
educ	education
grades	index of grades
motiv	achievement motivation
cultcap	index cultural capital
soccap	index social capital
jobexp	job experience
jobexpsqr	squared job experience
educfa	father's education
deducfa	dummy father's education
educmo	mother's education
deducmo	dummy mother's education
falowsk	father low-skilled laborer
facivils	father civil servant
faselfem	father self-employed
dfa	dummy job status father
molowsk	mother low-skilled laborer
mocivils	mother civil servant
moselfem	mother self-employed
dmo	dummy job status mother
lowsk	low-skilled laborer
civils	civil servant
selfem	self-employed
firmsz20	firm size up to 20 workers
firmsz200-2000	firm size 200-2000 workers
firmsz2000	firm size more than 2000 workers
firmszselfem	firm size self-employed
dfirmsz	dummy firm size
gender	gender
maritalsta	marital status
health	health status
immigr	migration status
parttime	part-time employment
west	West Germany

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