Climbing the Social Ladder: Does Intergenerational Solidarity matter?

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Climbing the Social Ladder: Does Intergenerational Solidarity matter?

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Abstract

Research on intergenerational transmission of inequality tends to focus on unequal access to wealth as well as human and social capital. Often lost in these discussions is the role of parent-offspring relationships. This study takes a closer look into families and investigates how the heterogeneity in family relationships may affect individual social mobility. We apply the concept of intergenerational solidarity to analyse how family relationships vary in nature. We explore two prominent features - emotional closeness and family obligations. Using World Value Survey microdata from 55 countries, we find that emotional closeness between parents and offspring is positively related to both the possibility and extent of upward occupational mobility. On the other hand, the strength of obligations felt towards family members is negatively associated with upward mobility. The obligations of caring for parents may influence offspring decision making, often hindering opportunities to climb the social ladder.

Keywords. Social Mobility, Intergenerational Occupational Mobility, Family Relationships, Intergenerational Solidarity, Intergenerational Transmission of Inequality

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I Introduction

Rising economic inequality is widely considered an important global challenge (A. B. Atkinson et al., 2011; Neckerman & Torche, 2007; Peterson, 2017; Piketty, 2000; Savage, 2021; Thorbecke & Charumilind, 2002; UNDESA, 2020). Among the various dimensions of inequality, social mobility is gaining high policy relevance. To address the persistent inequality across generations, international institutions and civic leaders emphasize the importance of enhancing social mobility, especially for disadvantaged groups (OECD, 2018). Various attempts have been made, such as policy reforms in education, tax system and the labour market. However, people from the bottom still find it difficult to climb the social ladder.

Researchers have advanced our understanding of social mobility barriers in various fields, including sociology, economics and psychology (A. B. Atkinson, 1980; Ellemers et al., 1997; J. J. Heckman & Mosso, 2014; Van Leeuwen & Maas, 2010). Intra-familial transmission of capitals and market inefficiencies such as imperfect credit markets, local segregation, and self-fulfilling inequality have been theoretically investigated to reveal the drivers of persistent inequality (Piketty, 2000). Institutional settings including political environment, macro-economic development and social policies are important for helping disadvantaged groups to move up (Landersø & Heckman, 2017). Meanwhile, socioeconomic scholars show that family plays a crucial role in explaining individual economic action and social mobility (J. Heckman & Landersø, 2022; Morgan et al., 2006; Smelser, Swedberg, et al., 2005).

At the micro family level, academic literature has explored three channels of intergenerational transmission of inequality. As proposed by Becker and Tomes (1979, 1986), the intergenerational human capital investment model suggests that parents are purely altruistic and allocate their resources to maximizing the utility from both their own and their offspring's consumption. Therefore, in perfect capital market condition, there is no causal link between parents' income and offspring's income. While in the presence of borrowing constraints, offspring from poor families receive fewer investment, which correspond to lower human capital and lower earnings. Moreover, the intergenerational transmission of material and financial capital are claimed to be a major cause for the persistence of inequality (Laitner & Ohlsson, 2001; Piketty, 2000). Additionally, the role of social capital in preserving socioeconomic status and hindering social mobility have been addressed recently (Chetty et al., 2020; Chetty & Hendren, 2018; Chetty et al., 2022; Deguilhem et al., 2019; Rajkumar et al., 2022).

Previous research adequately addressed the strong force of familial transmitted inequality while identifying possible channels. Yet, within-family analysis remains to be explored. Neoclassical tradition regards the family as an economic unit and family members as rational decision-makers. The neglects of family's societal and cultural roots tend to treat families as isolated and identical entities. In this context, family relationships do not vary across families, societies or cultures. Rejecting the pure economic agent idea, substantivism suggests that individuals are embedded and integrated in various social institutions in forms of "reciprocity", "redistribution", and "market exchange" (Polanyi, 1944; Polanyi et al., 1957; Polanyi, Pearson, et al., 1977). Among the three forms, reciprocity is closely involved in family, friendship and other social ties. Stepping forward,

Granovetter (1985) indicates that individuals are embedded in social networks and constantly respond to other agents' behaviours in the network. In other words, economic actions are based only partially on the utilitarian motivation. Social, cultural and relational contexts can affect individuals' decision makings. In line with the above contention, family demographers argue that the motivations of intergenerational support and exchanges cannot simply be put into the conventional utilitarian framework (Astone et al., 1999). On the contrary, intergenerational exchanges, to some extent represent reciprocity among family members, can vary across heterogeneous family relationships.

To study how heterogeneous family relationships can affect intergenerational transmission of inequality, the paper departs from the undersocialized neoclassical tradition and apply a pragmatic approach in economic sociology (Granovetter, 1985; Polanyi, 1944; Polanyi et al., 1957; Polanyi, Pearson, et al., 1977). Instead of following the assumption that all parents are purely altruistic, we assume that family values, social closeness, attitudes and closeness, developed through family member interactions, vary across families. To capture these differences, we introduce the concept of intergenerational solidarity in our empirical model. Intergenerational solidarity generally refers to the degree of closeness and support across generations. It is commonly used by social scientists to identify, understand and measure structural and socio-cultural variations in families. Intergenerational solidarity can be complex and involve various dimensions (V. L. Bengtson & Roberts, 1991; Szydlik, 2008). In our work, affectual solidarity (the degree of intimacy and emotional closeness between parents and offspring) and normative solidarity (the strength of obligation felt towards other family members) are studied in particular.

The paper offers an interdisciplinary analysis on intergenerational mobility, mobilizing the methods used by economists and sociologists. Theoretically, it departs from the neoclassical tradition of utilitarian framework (Becker & Tomes, 1979, 1986), questions the assumption that parents are purely altruistic and rational, and introduces the concept of intergenerational solidarity in the analysis to capture the heterogeneity of parent-offspring relationships. The introduction of intergeneratioinal solidarity makes it possible to link the three channels of intergenerational transmission of inequality and provide a relatively comprehensive analysis of intergenerational mobility. Empirically, we provide evidence based on microdata from World Value Survey wave 7. In our work, family is more than an economic unit. we recognize the complexity of household decision making and highlight the importance of family relationships in determining individual social mobility. By doing so, we hope to inform policies from a new perspective.

Following the introduction, section II surveys the relevant literature regarding intergenerational transmission of inequalities. Section III introduces the conceptual framework and how we measure intergenerational mobility and solidarity. In section IV, the data and methodology are discussed and descriptive statistics are provided. Section V presents the baseline model results and explores multiple robustness checks. Finally, conclusions and policy implications are made in section VI.

II Literature review: Intergenerationtional transimission of inequalities

The persistence of inequality across generations has long been an active research field in social science, with vast research trying to understand the relationship between parents' and their offspring's socioeconomic status (Corak, 2013; Laumann, 1970; Lipset, 1959). By measuring intergenerational elasticity of earnings (Aaronson & Mazumder, 2008; Lee & Solon, 2009; Mazumder, 2005; Solon, 1999) and studying mobility transition matrices (Chetty et al., 2014; Jantti et al., 2006), numerous empirical studies attempt to quantify the extent to which offsprings' socioeconomic outcomes are dependent on those of their parents'. Theoretical literature is also developed to study the forces driving the persistence of intergenerational inequality (Becker & Tomes, 1979, 1986; Bourdieu et al., 1984; Lin, 1999; Piketty, 2000, 2014).

Channels for intergenerational persistence of inequalities

Factors at both the macro institutional level and the micro household level can influence the fluidity of a society. Political environment, macro-economic development and social policies are important for helping the disadvantaged to move up. Moreover, it is essential intra-familiar transmission of inequalities. The transmission of human capital, material and financial capital, and social capital have been explored to feature the complexity of the topic.

The transmission of human capital includes adult offspring's experiences, skills and knowledge acquired either directly from parents or indirectly from their educational investment. The quantity and quality of human capital determine individuals' productivity in their occupational life and therefore their socioeconomic well-being. The intergenerational human capital investment model proposed by Becker and Tomes (1979, 1986) has long been the fundamental framework for economists to address intergenerational mobility. The core assumption of Becker and Tomes model is that parents are altruistic and allocate their resources to maximize their utility from both their own consumption and their offspring's future consumption. The human capital of the offspring is determined by endowments (abilities acquired from genetic transmission, such as physical appearances, cognitive ability, and cultural traits) and human capital investments (either from parents or governments). The investment in offspring' human capital follows the law of diminishing returns.

In the perfect capital market condition where there is no borrowing constraints, both high-income and low-income parents are able to make optimal investment decisions where the marginal rate of return of educational investments equals the interest rate. Hence, the productivity or earnings of adult offspring are only determined by the endowments inherited from their parents. There is no causal link between parents' income and their offspring's income (Becker & Tomes, 1979). On the contrary, in presence of borrowing constraints, parents who are financially constrained are not able to invest optimally on their offspring. For adult offspring with same endowments, those from poor families (with financial constraint) receive fewer investments which correspond to lower human capital and lower earnings (Becker & Tomes, 1986).

The transmission of material and financial capital are relatively direct. Parents transfer wealth to their offspring in forms of gifts or bequests (after the parents' death) (Kohli, 2004). Intergenerational wealth transfer plays a significant role in the persistence of inequality (Laitner & Ohlsson, 2001; Piketty, 2000). It is found that children from wealth families have a larger possibility to be wealthy themselves in the future (Di Zhu, 2002; Hertz, 2006). For people from high socioeconomic backgrounds who are at the top quantiles of income distribution, wealth is more persistent across generations (De Nardi, 2004; Hout, 2004; Ohlsson et al., 2008), which can lead to a "wealth trap" (Piraino, 2007).

Wealth transfers affect offspring' permanent earnings either directly or indirectly. Returns on financial capital directly increase non-wage earnings. Wealth is reported to explain nearly a third of intergenerational persistence of income (Bowles & Gintis, 2002). Moreover, financial inflow contributes to offspring health and physical condition, educational attainment and housing, which may correspond to long-term increase in earnings (Boehm & Schlottmann, 1999; Hill & Stafford, 1978; Holtz-Eakin et al., 1993; Shapiro et al., 2004; Shlay, 2006). Mazumder (2002) argues that there is a positive relationship between intergenerational income elasticity and the amount of wealth owned by their parents.

The role of social capital in preserving socioeconomic status and impeding social mobility gains growing research interests, both theoretically and empirically (Bourdieu et al., 1984; Lin, 1999). Social capital are resources embedded in social networks (Burt, 2009; Lin, 2002; Portes, 1998; Tardos, 1996). Literature in social capital can be categorized into two primary groups: family-based social capital and community-based social capital. Family-based social capital is mainly obtained through ties between family members, including individual connections, social support and other resources embedded in the family network (Coleman, 1988). Family-based social capital also belongs to bonding social capital, which is embedded in relatively strong networks built among members that are closely connected like families or same ethnic groups (Putnam, 1995; Putnam et al., 2000). Community-based social capital can be acquired through civil engagement, mutual help groups, and sports associations, among others (Coleman, 1994; Putnam, 1995; Sensenbrenner & Portes, 2018). Community-based social capital is a type of bridging social capital, which is normally weaker than family-based social capital, but more inclusive and provide links between diverse groups of people (Putnam, 1995; Putnam et al., 2000).

The importance of social capital in determining social mobility draws increasing attention with focuses on the effect of neighborhood, income segmentation, job referral through social ties, among others (Chetty et al., 2020; Chetty & Hendren, 2018; Chetty et al., 2022; Deguilhem et al., 2019; Rajkumar et al., 2022).

Family relationships and individual social mobility

Among various types of social ties, family ties are important for the development and socialization from infancy to adulthood (Lewis, 2005). It plays an important role in one's social network of strong ties (Fors & Lennartsson, 2008). Not only the quantity but also the quality (strength, closeness, content, interaction dynamics) of family ties matters in determining social mobility. Family

ties can influence social mobility in multiple ways. On the one hand, family support and network provide resources that can facilitate upward mobility. The intergenerational exchanges, often in the form of time and financial support (such as education investment to younger generations), are essential for future earning outcomes (Isengard et al., 2018; Spilerman, 2000). Also, people can acquire information on jobs through strong or weak social networks (Gee et al., 2017; Montgomery, 1991). On the other hand, strong family ties can cause coordination failure in individual decisions, which leads to a poverty trap (Akerlof, 1976; Di Falco & Bulte, 2011; Hoff & Sen, 2011). Compared with wealthier people, those with lower status often have a small family-focused social network (Van Groenou & Van Tilburg, 2003) and tend to live closer with their family (Lennartsson, 2001). Alesina and Giuliano (2010) also shows a lower geographical mobility linked with stronger family ties, while geographical mobility is often linked with better education and work opportunities. In addition, individuals with strong family ties are empirically tested to have lower wages (Alesina et al., 2015).

Therefore, considering both aspects, the heterogeneity of parent-offspring relationships can have complex impacts on individual social mobility. However, there is limited empirical research investigating the relationship between the differences in family ties and intergenerational mobility.

III Conceptual framework

We conduct an empirical work to uncover how family ties affect the transmission of inequality across generations. Our empirical composition is inspired by the intergenerational human capital investment model proposed by Becker and Tomes (1979, 1986). However, we question the core assumption that parents are purely altruistic (Cox, 1987; Foster & Rosenzweig, 2001; Kotlikoff & Spivak, 1981), as this ignores the heterogeneity of family structures and reciprocity within family relationships. For example, intergenerational exchange varies across families (Albertini & Kohli, 2013). In Southern European countries, offspring do not frequently receive direct financial support from their parents. However, it is common for them to live with their parents, a practice that has become the major channel for intergenerational exchange. On the contrary, adult offspring from Nordic countries rarely live with their parents. However, they normally receive direct time or financial support from their parents. In addition, the capacity of family support is not limited to the time and resources transmitted from parents to their offspring. Various degrees and types of reciprocity are also documented. Rowlingson et al. (2017) underline the growing relevance of inter vivos transfers and financial exchanges in supporting both children's attainment of independence and their longer-term capacity to reciprocate by aiding their parents. Care to parents has historically been linked to expectations of eventual inheritance.

Considering the complexity of parent-offspring relationships as documented by family demographers, the motivations of intergenerational support and exchanges cannot simply be put into the conventional utilitarian framework (Astone et al., 1999). Altruism, reciprocity and emotional closeness jointly determine individual decision making process (V. Bengtson et al., 2002; Michael Bradley & Cafferty, 2001). According to the concept of social embeddedness Granovetter (1985), Polanyi (1944), Polanyi et al. (1957), and Polanyi, Pearson, et al. (1977), parents and offspring

can be regarded as ”embedded” individuals in the family relation and other networks, where they respond to the behavior of other actors in the networks, develop attitudes, norms and emotional closeness towards other actors. Therefore, the utilitarian motivations and social networks that individuals embedded jointly influence their decisions. To better illustrate intergenerational exchanges and decision making within households, we build a system involving two generations (parents and offspring) and two periods (childhood and adulthood). During childhood, offspring receive care and financial investment (mainly in the form of human capital investment) from their parents. In their adulthood, they provide care to their parents, and receive bequest from their parents. Family values, attitudes and closeness, developed through family members' interactions with their families and other social networks, can influence within-households decision makings and determine the quantity and quality of intergenerational exchanges.

We introduce intergenerational solidarity in our empirical model to analyse familial variation. Social scientists often use this tool to measure structural variation and understand socio-cultural variations in families. Generally referring to the degree of closeness and support across generations, intergenerational solidarity is useful to analyze the bonds within a family and how intergenerational exchange, support and dependence works. Intergenerational solidarity can be complex and involve many aspects. The pioneering work by V. L. Bengtson and Roberts (1991) conceptualizes it as multi-dimensional, including six dimensions: associative, affectual, consensual, functional, normative and structural solidarity. These dimensions measure the frequency of shared activities between family members (associative solidarity), the degree of intimacy and emotional closeness (affectual solidarity), the closeness of opinions, lifestyles and values (consensual solidarity), exchanges of time, support and money (functional solidarity), the strength of obligation felt towards other family members (normative solidarity) and how much exogenous factors like geographical distance can affect contacts between family members (structural solidarity). The subsequent work by Szydlik (2008) classifies these features of intergenerational solidarity into three categories: functional, affectual, and associational solidarity. Opportunity, need, family, and cultural-contextual structure are the four groupings of conditional elements for solidarity and intergenerational solidarity is primarily a dyadic relationship of persons immersed in a family and a societal setting.

Measuring within-family solidarity

Previous literature has classified numerous dimensions of intergenerational solidarity that is comprehensive with high level of complexity. In the empirical work with limited data availability, for the measurement of intergenerational solidarity, two dimensions are particularly important. The affectual solidarity is an inclusive variable which captures the closeness between parents and their offspring. It can be regarded as the fundamental determinant and reflection of the frequency of shared activities (associative solidarity), the similarity of opinions (consensual solidarity) and the amount of integenerational exchange (functional solidarity). Another crucial dimension is normative solidarity that corresponds to utilitarian motivations across generations, a concept does not solely stand on family relations, but is also influenced by institutional settings. Going beyond micro-level family relations, normative solidarity is formed and shaped by various cultural context

and within different social welfare regime(Kasearu & Kutsar, 2013). Normative solidarity and social welfare often complement with each other in care giving of the elderly (Daatland & Herlofson, 2003; Kohli, 1999; Saraceno, 2008). Saraceno (2008) interprets social welfare as a regime to regulate obligations of generations. For example, maternity leave, education and the pension system can be regarded as legal formations of family obligations. The high involvement of government in providing welfare may change the norm of family members acting as caregivers. Accordingly, there will be crowding out effects that leads to weaker normative solidarity to some extent(Cox & Jakubson, 1995). Daatland and Lowenstein (2005) finds that though easier access to welfare state services could not replaced the family, but may have contributed the way families related to each other. Social welfare may shift the importance of different dimensions in intergenerational solidarity from normative solidarity to other solidarity. Accordingly, to feature intergenerational solidarity, we highlight the dimensions of affectual solidarity and normative solidarity and measure them based on several survey questions.

Measuring individual social mobility

The concept of social mobility captures the extent to which adult offspring's socioeconomic status is related their family background. Sociologists typically characterize social mobility in term of social classes or occupational status, while economists prefer to use indicators like individual earnings or family income.

Documenting social mobility using occupational outcomes has a long and distinguished history in sociology studies since 1960s. Individuals obtain education in order to be qualified for their occupation, from which they earn incomes. Therefore, as the link between education and income, occupation status is able to capture both individual social and economic status (Duncan, 1961). Sociologists typically transform occupation status to either cardinal variables like occupational prestige (Hodge et al., 1964; Treiman, 1977) and occupational socioeconomic index score (Duncan, 1961; Hauser & Warren, 1997), or categorical variables by aggregating individuals into different social groups based on their occupation (Erikson & Goldthorpe, 1992; Jonsson et al., 2009). One of the reasons for the wide use of occupational data is that it can be collected easily, with relatively fewer problems concerning refusal and reliability (Hauser & Warren, 1997). Moreover, for mobility studies, adult offspring are more able to report their parents' occupational status comparing to earnings or income. Another major advantage of using occupational status is its stability over individual life path (Hauser, 2010; Hauser et al., 2000). In regard to long-term socioeconomic well-being, using occupation status may be a better solution than using income data collected from a single year (Goldberger, 1989; Zimmerman, 1992). The downside of using occupational status lies in gender differences. According to Warren et al. (2002), occupational return of education varies between genders, with female having higher education but lower earnings for the same occupation, making it complicated to calculate and compare socioeconomic status base on occupation for studies across genders.

Different from sociologists, economists turn to use individual earnings or family income as the major measure, due to the fact that economic resources are important components of socioeconomic

well-being. Using earnings or income as indicators of socioeconomic status are less complex than using occupational status, which makes it simpler for cross country or cross time comparisons. The studies of intergenerational income mobility starts from measuring income mobility based on data collected from a single year. The methodology had received numerous critiques indicating that lifelong income should be the appropriate measure (A. B. (B. Atkinson, 1983; Solon, 1989; Zimmerman, 1992) Income differences are smaller for individuals in their early career than those in their mid or late stages. (Jenkins 1987, Thus, at which age the income is measured would lead to statistical noise (Nybom & Stuhler, 2017). As permanent income is difficult to obtain, several methodological improvements are introduced, such as the use of instrument variables like occupation and education (Bound et al., 1995), the use of control variable like age and age squared (Blanden et al., 2004). However, with methodological improvements, more revisions in estimates are also needed (Jäntti & Jenkins, 2014). Using income collected in individuals' middle age is suggested as a good way to reduce methodological problems (Haider & Solon, 2006).

In our work, we use occupational mobility as a measure of social mobility due to the availability of data. Socioeconomic index scores are assigned to occupations, attempting to provide an illustration on both occupations' social status and income level.

Hypotheses

Our paper aims to explore how the heterogeneity in family ties influences individual social mobility. To provide empirical evidence on the topic, we study the relationship between differences in within-family intergenerational solidarity and offspring's occupational mobility. In particular, the dimensions of affectual solidarity (emotional closeness) and normative solidarity (strength of family obligations) are highlighted.

Emotional closeness is closely linked with the level of altruism between individuals (Bressan et al., 2009; Korchmaros & Kenny, 2001). The degree of altruism can affect the quantity and quality of intergenerational exchanges, both explicitly and implicitly. Higher level of human capital investment can improve the socioeconomic outcomes of the offspring (Cheadle, 2008; Lareau, 2011; Potter & Roksa, 2013). With closer emotional ties, time spend together with families can also be higher, leading to more efficient transmission of social capital and cultural capital. The sense of family obligations, however, can affect young adults' decision making in educational, occupational and geographical choices that can be critical for their future development (Fuligni & Pedersen, 2002).

Therefore, our hypotheses contains two parts: 1) Affectual solidarity (emotional closeness) will imply a positive relationship with upward occupational mobility. 2) Normative solidarity (strength of family obligations), however, will have negative influence on offspring's decision making when they face life opportunities and hinder upward occupational mobility.

IV Data and methodology

Data

The empirical research is based on microdata from World Values Survey wave 7. World Values Survey has been collecting data regarding values, attitudes and beliefs through social surveys every five years. The coverage of the data has reached more than 120 countries across Europe, Asia, North and Latin America. World Values Survey wave 7 started in mid 2017 and closed in December 2021. The wave covers 80 countries and around 85,000 respondents, monitoring family cultures, social values, attitudes towards gender, religion and race, trust in different relationships, education, occupation, among others. The data is cross-sectional data which shows "how the values of the given country or society have been changing over time" instead of "how the values of a selected group of people (panel) have been changing over their life".

The initial data has 84,638 observations. The percentage of missing values across the variables varies between 0 and 22 percent. Totally, 40,021 out of 84,638 cases (which represents 47 percentage of total cases) are incomplete, leaving 44,617 complete cases. As shown in Figure 1, The occupation of respondents and fathers, the education of fathers and mothers, Q105 (the membership status in other associations) are largely missing with survey answers being "not recorded", "unemployment" or "not applicable". The main reason for missing value in respondent's occupation is that the age of the respondents ranges from 16 to 103. Therefore, at the age of the survey, some of the respondents were not yet in the labour market. Among the missing values of respondents' occupation, around 40 percent comes from people under age 26. As our research regards occupational mobility which may only apply to people in the labour market, ruling out the missing values will not lead to large selection bias. For the missing values in the occupation of fathers, the survey question asks for the fathers' occupation when the respondent was 14 years old. There is a possibility that the respondent does not remember the information which can be regarded as random. The missing values from education of mothers and fathers are recorded mainly as "don't know", "not asked in the survey" or "no answer", for which there is no evidence showing that it is not random. For the variable regarding the membership status in other associations, the survey question ask if the respondent is active in any other associations that are not included in previous questions. Since the question is too broad, it potentially leads to large random missing values. considering the fact that our data mainly consists of categorical variables collected from survey data, the use of multiple imputation can possibly lead to larger bias compared to listwise deletion (complete case analysis) (Allison, 2005). Meanwhile, after listwise deletion, the data left still represent a considerable sample for our analysis. Therefore, we perform the listwise deletion (complete case analysis) to treat the missing values.

Variables

To capture the respondents' and their fathers' socioeconomic status in a more detailed manner, we follow Hauser and Warren (1997) and allocate the socioeconomic index score to the occupational

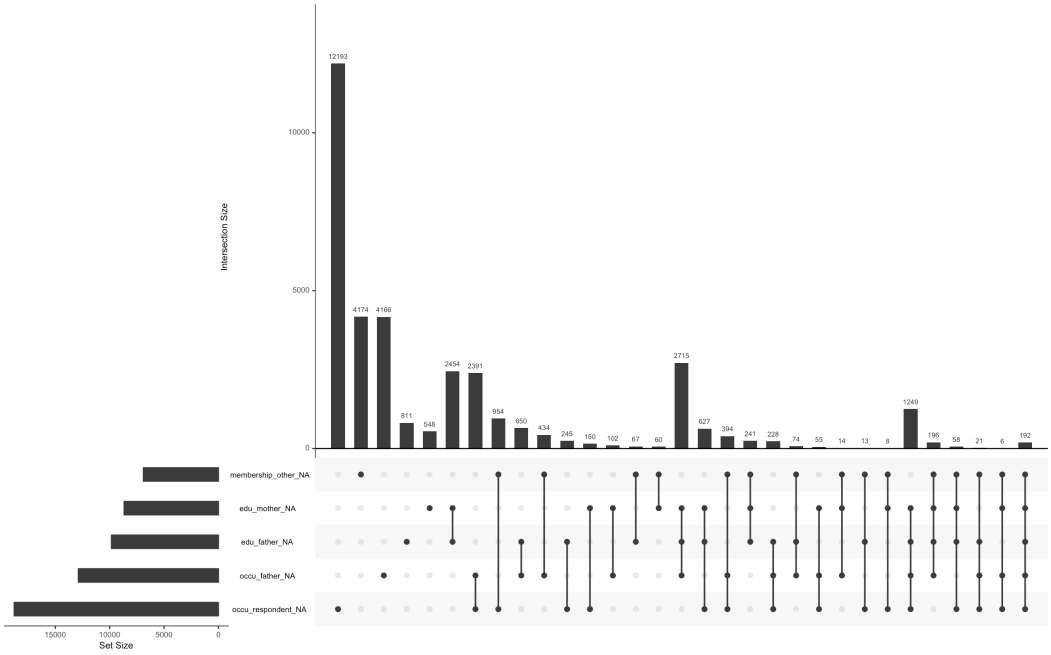

Figure 1: Missing Values

groups categorized by World Values Survey. Table 1 describes the socioeconomic index for each occupational group. The highest score is allocated to occupational group 1 and 2 in the World Value survey which corresponding to occupations like professional, technical and Higher administrative since these occupations require relatively higher education and more specific skills while paying a relatively high salary. The second highest score was allocated to occupations regarding sales position. The occupational groups include jobs like shop owner and sales manager, require some extent of skills and pay salaries that are dependent on sales skills. Clerical occupations receive a lower score than the sales occupation. Although they require relatively high education to do the job, the compensation of the job is not as high as sales occupation. Farm owner and farm managers are allocated high scores by Hauser and Warren (1997), as they require management skills and earn good amount of money. Skilled workers like foreman and motor mechanics also receive moderate socioeconomic score. Higher education is not required for such type of work, but the specific skills needs time to be trained which also acts as a barrier for people to enter the occupation. Thus they are well paid. However, service occupations require relative lower skills and are not payed as well as skilled workers. The score ranking for the rest of the occupational groups are semi-skilled workers such as bus drivers, farm workers and unskilled worker. The occupational groups categorized by the World Value Survey are relatively broad. Therefore, it does not capture the full detail of the occupation of the respondent and only characterize the overall upward mobility which is a bit general. The issue will be addressed later in the robustness checks.

Following what is described above, we measure upward mobility in two ways. First, we consider upward mobility as a binary variable, which only represents whether the offspring experience upward mobility or not. The value of the dependent variable will be calculated based on whether offspring's socioeconomic index of occupation is larger than that of their fathers'. Alternatively,

Table 1: Socioeconomic Indices for Occupations

occu_group	description	ISEI
1	Professional and technical (e.g.: doctor, teacher)	67
2	Higher administrative (e.g.: banker)	67
3	Clerical (e.g.: secretary, clerk, office manager)	49
4	Sales (e.g.: sales manager, shop owner)	51
5	Service (e.g.: restaurant owner, police officer)	38
6	Skilled worker (e.g.: foreman, motor mechanic)	44
7	Semi-skilled worker (e.g.: brick layer, bus driver)	32.5
8	Unskilled worker(e.g.: labourer, porter)	23
9	Farm worker(e.g.: farm labourer, tractor driver)	24.5
10	Farm owner, farm manager	46

Source: Hauser and Warren (1997)

to retain more details provided by socioeconomic indexes, we are able to measure the extent to which offspring move upward, which can be calculated based on the difference between offspring socioeconomic index of occupation and that of their fathers'. Accordingly, we use different statistical models for the above approaches.

For our variable of interest, as discussed above, we mainly consider affectual solidarity and normative solidarity. Two questions in the World Value Survey are relevant with affectual solidarity: 1) indicate how important family is in your life; 2) whether you trust your family completely, somewhat, not very much or not at all?

The two questions are addressed to the respondents, which in our case are the offspring. As discussed in the social embeddedness theory, offspring respond to their parents' actions and develop attitudes towards their parents during daily interactions. The mutual relationship formed during the process suggests correlation between offspring's attitudes towards their parents and the parents' attitudes toward their offspring. Therefore, the answers reported by the offspring could be used as a good proxy for not only the emotional attachment from offspring to their parents, but also mutual emotional closeness between them.

The question "to what extent do you agree that adult children have the duty to provide long-term care for their parents" is a direct measurement of normative solidarity. The obligations felt for caring their parents are determined by various factors such as gender, the social welfare system, the cultural context and also the parents' own preferences and behaviors. Thus it is a good measure characterizing the intergenerational contract from offsprings to their parents.

Besides the two main explanatory variable, our model also includes variables that capture other social networks (i.e., the importance of friends, degree of trust in friends, number of associations attended) and some common control variables (i.e. gender, age, health, marital status, whether they live with their parents and fathers' education). The general hypothesis for the variables are that other aspects of social network also enable upward mobility. The attitudes towards friends, the trust in people you know and the active participation in various associations would expose the

offspring to more information on job opportunities and increase the chances of getting a better job, thus leading to upward occupational mobility. Moreover, the job referral process within the social network also have the possibility of facilitating upward occupational mobility. In order to make better predictions, as suggested by Garavaglia and Sharma (1998), most of the original categorical variables collected in the survey data (except for age and education data) are transformed to dummy variables for higher predictive power, stability and simpler interpretation.

Model

Corresponding to the two dependent variables, which are either dichotomous or discrete values, two basic models are conducted: the probit model and the negative binomial model. The dependent variable used in the probit model is upward mobility, which equals one if the offspring experience upward mobility and equals zero otherwise. The dependent variable used in the negative binomial model is measured by the difference between the offsprings' and their father's socioeconomic indexes (socioeconomic index of father's occupation minus socioeconomic index of offspring's occupation). In this case, the negative values are recorded as zero while the zeros and positive values are kept original. All the values are rounded to integers to fit the models.

The probit model is commonly used when the dependent variable is dichotomous. The following model is constructed:

$$\Pr(Y_{ip} = 1) = \mu(\alpha_0 + \beta X_i + \gamma W_p + \theta S_{ip} + \epsilon_{ip}) \tag{1}$$

In the probit model adopted, i represents individual; p represents country; Y_{ip} is the binary variable indicating the existence of upward mobility. Y_{ip} equals one if the offspring's socioeconomic index of occupation is higher than that of his or her father's.

In the model with the dependent variable containing more details, we use the zero-inflated Poisson model. As our dependent variable is discrete data, positive values represent the extent of the offspring's upward mobility and zeros represent no mobility, as suggested by Lambert (1992) who assert that a zero-inflated Poisson model should be used for discrete data with excess of zeros. The zero-inflated Poisson model suggests the treatment discrete data and the excess zeros separately. It is assumed the zero outcomes are reached in two independent processes. In our model, we assume that if the father is already in the highest socioeconomic status, there is no possibility for his offspring to experience upward mobility, thus the value of the dependent variable is certainly to be zero. In other cases, it follows the general possion modelling. Therefore, the expected outcome of the dependent variable is predicted with two processes together:

$$\begin{aligned} &E(d_{\text{upward mobility}} = k) = P(\text{father at the highest}) * 0 + \\ &P(\text{father not at the highest}) * E(y = k|\text{father not at the highest}) \end{aligned} \tag{2}$$

Two models are conducted in this process: a logit model which predits the excess zeros (similar

with Equation 1)and a possion model which predicts the log of the expected dependent with a set of explanatory variables:

$$ln(Y_{ip}) = \alpha_0 + \beta X_i + \gamma W_p + \theta S_{ip} + \epsilon_{ip} \tag{3}$$

The main explanatory variable for both models is X_i which measures the intergenerational solidarity for individual i, consists of two variables capturing affectual solidarity and normative solidarity. W_p refers to regional control variables in country p, characterized by country dummies. S_{ip} controls other variables such as fathers education (Gong et al., 2012), age(Blanden, 2013), other aspects of social network, among others that may affect social mobility.

Descriptive statistics

As shown in Table 2, nearly half of the population in our sample have experienced upward mobility, with various extents ranging from value 0 to 44 in terms of the increases of socioeconomic index scores. For the key variables of interest, the value of intergenerational solidarity is high in general, indicating that even with the trend of individualization and diminishing of communities, the bonds between parents and their offsprings are still strong. It emphasize higher importance to study in detail the intergenerational relationship. Comparing the two aspects of intergenerational solidarity, the percentage of people with high affectual solidarity is larger than the percentage of people with high normative solidarity, which indicates that the majority of the population in the sample have a relatively close relationship with their parents, while the obligations they felt in the parent-offspring relationship varies. There is a proportion of the population that is emotionally close to their parents but do not think that long-term care for their parents is their responsibility. This suggests that the different aspects of intergenerational solidarity may not follow the same direction, therefore it is essential to study some of the dimentions of intergenerational solidarity separately, which also justifies our model. The reasons for the relatively lower normative solidarity can be due to the existence of social welfare system, the self-sufficiency of the parents, among others. Comparing to the importance of family, less proportion of the population think friends are very important, while they normally trust their friends. From the trend we can possibly identify the relative more important role of family than friends in a person's life course. For weaker social ties, there is only around 10 percent of the respondents who attend more than 6 types of association, which indicates that bridging social capital may relatively be less that the bonding social capital. This is in line with the findings of (Putnam et al., 2000) that the community and associations are diminishing. Besides, there are small quantity of people facing health problems, and a significant amount of people still lives with their parents or their parents-in-law. Co-residence with their parents or parents in law can be caused by many factors, such as, do not have enough financial resources to live alone, would like to live with parents in order to take better care of them, would like to stay closer to the parents because of other reasons. Considering the complexity of cohabit and its possibility of generating noise in our model, we test both models with cohabit variable and without cohabit variable.

Table 2: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
upward_mobility (0/1)	44,617	0.485	0.500	0	0	1	1
extent of mobility	44,617	8.892	11.829	0.000	0.000	18.000	44.000
affectual solidarity	44,617	0.875	0.331	0	1	1	1
normative solidarity	44,617	0.717	0.450	0	0	1	1
importance of friends	44,617	0.435	0.496	0	0	1	1
trust in friends	44,617	0.775	0.418	0	1	1	1
membership	44,617	0.128	0.334	0	0	0	1
gender	44,617	0.473	0.499	0	0	1	1
age	44,617	43.580	15.350	16	31	55	99
health	44,617	0.055	0.227	0	0	0	1
marital	44,617	0.679	0.467	0	0	1	1
cohabit	44,617	0.267	0.443	0	0	1	1
education of father	44,617	2.400	1.991	0	1	3	7

V Findings

Regression results

Table 3 shows the regression results for both baseline models. Model(1) and model (2) are results from probit model using binary variable the existance of upward mobility as dependent variable. Model (3) and model(4) are results from zero-inflated Poisson model using the extent of upward mobility as dependent variable.

In line with our hypothesis, model(1) indicates that high affectual solidarity can increase the chance for upward mobility, while the high normative solidarity impedes upward mobility. The results are significant at 1 percent and 5 percent significance levels, respectively. The importance of friends does not show significant impact on the possibility of upward mobility. However, the more a person trust his or her friends, the larger chance that he or she experience upward mobility, suggesting the power of social ties among friends. The results for other control variables are in line with previous studies, with minor differences due to model setting.

Model(2) adds cohabit as one of the predictors, it measures if the offspring lives with his or her parents or parents-in-law. It is shown that living with parents, also regarded as a proxy for geographical mobility, has a negative but not significant effect on the chance of moving upward. Adding the extra variable does not decrease the significance of our key explanatory variables.

Model(3) captures how intergenerational solidarity is related to the extent of upward mobility. In this regard, affectual solidarity has more predictive power than normative solidarity. Emotional closeness with parents do not only increase the possibility of upward mobility, but also have a

positive impact on how much the offspring moves upward. On the contrary, high normative solidarity, even though lower the possibility of upward mobility, does not seem to have a significant relationship with the extent of upward mobility. Membership, which represents the weak ties or bridging social capital, helps to increase the extent of upward mobility.

The extra predictor cohabit is added to model(4), which indicates that living with parents will lower the extent of upward mobility. The results is significant at 1 percentage confidence interval. However, adding the extra predictor does not diminish the explanatory power of affectual solidarity.

From the above baseline models, we can see that the affectual solidarity has a positive relationship with both the possibility of upward mobility and the extent of upward mobility. Higher emotional closeness are linked with higher level of altruism (Bressan et al., 2009; Korchmaros & Kenny, 2001), which corresponds to more investment in human capital, higher amount of bequests received, more time and efforts received from parents. Moreover, the emotional support from parents and good psychological conditions of the offspring will be helpful to improve their academic performance (Wentzel, 1994). The above mentioned features will lead to higher socioeconomic outcome, higher possibility of upward mobility, and larger extent of upward mobility.

To be sure, normative solidarity is only significantly related to the possibility of upward mobility but not the extent of upward mobility. In other words, the strong obligation of caring for parents will decrease the possibility of upward mobility, but it has no significant relevance with the extent of moving upward. To interpret the result, firstly we review the mechanism that possibly lead to the negative relationship between normative solidarity and upward mobility. The high level of normative solidarity represents strong obligations the offspring feels for caring for his or her parents. Stronger sense of family obligations may affect young adults' decision makings in educational, occupational and geographical choices that can be critical for their future development (Fuligni & Pedersen, 2002) and hinder them to climb the social ladder. However, once the individual made the importance decision of staying closer or moving away from their parents, the rest of his life course is relatively independent. Therefore, the normative solidarity only has a negative impact on the possibility of upward mobility and not much explanatory power of the extent of upward mobility is in line with our conceptual framework and hypothesis.

Table 3: Regression Results

	Dependent variable:			
	upward_mobility		extent of upward mobility	
	probit		*zero-inflated count data*	
	(1)	(2)	(3)	(4)
affectual solidarity	0.063***	0.063***	0.031***	0.031***
	(0.019)	(0.019)	(0.005)	(0.005)
normative solidarity	−0.033**	−0.033**	−0.004	−0.004
	(0.015)	(0.015)	(0.004)	(0.004)
importance of friends	0.007	0.007	−0.009***	−0.009***
	(0.013)	(0.013)	(0.003)	(0.003)
trust in friends	0.068***	0.068***	0.027***	0.027***
	(0.016)	(0.016)	(0.004)	(0.004)
membership	−0.009	−0.008	0.071***	0.071***
	(0.019)	(0.019)	(0.005)	(0.005)
gender	0.140***	0.139***	0.002	0.001
	(0.013)	(0.013)	(0.003)	(0.003)
age	−0.003***	−0.003***	0.001***	0.0004***
	(0.0004)	(0.0005)	(0.0001)	(0.0001)
marital	0.086***	0.083***	0.021***	0.017***
	(0.014)	(0.014)	(0.004)	(0.004)
education of father	−0.151***	−0.151***	−0.024***	−0.024***
	(0.004)	(0.004)	(0.001)	(0.001)
cohabit		−0.016		−0.019***
		(0.016)		(0.004)
health	−0.116***	−0.116***	−0.071***	−0.071***
	(0.027)	(0.027)	(0.008)	(0.008)
Constant	0.432***	0.443***	2.783***	2.796***
	(0.055)	(0.056)	(0.014)	(0.014)
Country	Yes	Yes	Yes	Yes
Observations	44,617	44,617	44,617	44,617
Log Likelihood	−29,418.330	−29,417.870	−146,931.700	−146,922.100
Akaike Inf. Crit.	58,966.670	58,967.730		

Note: *p<0.1; **p<0.05; ***p<0.01
results for country dummies are shown in the appendix

Robustness checks

In our baseline model(3) and (4), we assume that the data follows Poisson distribution where the mean is equal to its variance. However, there may be minor over-dispersion problems in our model. Therefore we run a zero-inflated negative binomial model as robustness check. The zero-inflated negative binomial is similar to the zero-inflated Poisson model, but it generalizes Poisson regression model and uplifted its assumption that the mean has to be equal to variance. The second robustness check is to treat the excess zeros using hurdle model. It is a two-part model consists of two sequential and separate models (Frees, 2009), which was first proposed by (Cragg, 1971) and further developed by (Mullahy, 1986). The first part of the hurdle model is typically a probit model, which predicts if the expected outcome takes the positive value or not. The second part is a count model based on a truncated-at-zero data which only consists observations with positive values. In other words, the model specifies two process: when there is a hurdle, the value of the dependent variable is zero; if the hurdle is crossed, there occurs the positive values. Our third robustness check changes the dependent variable from occupational mobility to educational mobility, as the occupational groups provided by World Value Survey is relatively broad, possibly leading to over-generalization. We use another important indicator of intergenerational mobility, educational mobility, to test the existence of the relationship between intergenerational solidarity and intergenerational mobility. Educational mobility is relatively easy to measure and report than other socio-economic outcomes and is closely linked to the fundamental mechanism of transmission between generations.

According to the results of the robustness check shown in Table 4, It is still significant that higher affectual solidarity is related to larger extent of upward mobility, for both zero-inflated negative binomial model and hurdle model. Meanwhile in the probit model, similar pattern is found with educational mobility and occupational mobility. High affectual solidarity increase the possibility of upward educational mobility while high normative solidarity decreased the chance. The results are significant at 1 percent significance level. It shows that the minor over-dispersion and the treatment for excess zeros in the baseline models do not lead to serious estimation bias. The above robustness checks indicates that our model is robust.

Table 4: Robustness Checks

	Dependent variable:		
	extent of upward mobility		upward educational mobility
	zero-inflated count data	*hurdle*	*probit*
	(1)	(2)	(3)
affectual solidarity	0.032**	0.032**	0.066***
	(0.014)	(0.014)	(0.020)
normative solidarity	−0.006	−0.006	−0.055***
	(0.011)	(0.011)	(0.016)
importance of friends	−0.010	−0.010	0.013
	(0.009)	(0.009)	(0.013)
trust in friends	0.026**	0.026**	0.046***
	(0.011)	(0.011)	(0.016)
membership	0.072***	0.072***	0.016
	(0.014)	(0.014)	(0.020)
gender	0.001	0.0002	−0.028**
	(0.009)	(0.009)	(0.013)
age	0.001	0.001	−0.003***
	(0.0003)	(0.0003)	(0.001)
marital	0.017*	0.017*	0.075***
	(0.010)	(0.010)	(0.015)
education of father	−0.024***	−0.024***	
	(0.003)	(0.003)	
education of mother			−0.225***
			(0.004)
cohabit	−0.019	−0.018	0.005
	(0.011)	(0.011)	(0.017)
health	−0.072***	−0.071***	−0.212***
	(0.020)	(0.020)	(0.028)
Constant	2.790***	2.790***	1.189***
	(0.038)	(0.038)	(0.061)
Country	Yes	Yes	Yes
Observations	44,617	44,617	44,617
Log Likelihood	−110,607.200	−109,570.600	−26,011.770
Akaike Inf. Crit.			52,155.530

Note: *p<0.1; **p<0.05; ***p<0.01
results for country dummies are shown in the appendix

VI Conclusions and policy implications

This study presents evidence on how heterogeneity in parent-offspring relationships may affect individual occupational mobility. Drawing on microdata from World Value Survey from 55 countries, we focus on two key measurements of intergenrational solidarity: emotional closeness and family obligation. Our results suggest that emotional closeness between parents and offspring is positively related to both the possibility and extent of upward occupational mobility. However, the strength of obligations felt towards family members is negatively associated with the possibility of moving up.

We offer caution when interpreting our results. As our analysis is descriptive in nature and so we can not infer causality. Moreover, we are concerned about potential reverse causality. Individuals who experienced upward mobility may undertake less life pressure and have more capacity dealing with family issues, leading to closer family relationships. In the meantime, they may have easier access to care providers for their parents, which correspond to weaker sense of family obligations. We encourage future research to explore the causal relationships. Moreover, our work only features two prominent dimensions of intergenerational solidarity, leaving the associative, consensual, functional and structural solidarity not discussed. With greater availability of data, other dimensions can be further explored to fully unwrap the mechanism for their influence on social mobility. Moreover, as a micro level discourse, we keep our analysis at the family level. The state-level effects are controlled by including country dummy variables but not studied in details. However, the influence of families can be weak or strong, depending on other institutional settings they embed. Different social welfare system and level of economic growth may affect the role of families in individuals' development. Policies might also change the nature of family relationship, crowding in or out family obligations (Kasearu & Kutsar, 2013; Künemund & Rein, 1999). For that reason, a multi-level model including country-level variables may be looked into to study the interaction effects of the family and state. Other research methods such as agent-based modelling could also be helpful to study the topic from various aspects.

Despite the limitations, our paper offers an innovative theoretical development in understanding how parent-offspring relationship may influence individual social mobility. Instead of treating families as homogeneous economic units, we dive deeper into the parent-offspring interactions, and how that may shape the time and financial investment for the child, as well as their future career opportunities. This represents a first step towards formalizing the role of within-family heterogeneity in emotional closeness and strength of family obligation in intergenerational inequality. Our evidence suggests that interventions promoting the emotional closeness within a family show stronger beneficial results for the long term. Understanding how healthy emotional bonds could be created and how parents can be incentivized to engage with their child emotionally may help unlock barriers for intergenerational mobility.

In the mean time, strong family obligations born by young adults might impede them from upward mobility, especially in the context of aging population. The growing pressure of care giving to parents will limit the geographical and occupational choices one may have. Therefore, it is essential that the public sector provides effective interventions. Providing the safety net for elderly from low

socioeconomic background are especially important in promoting upward mobility. Meanwhile, labour market and job assistance can be targeted for people from low socioeconomic background with high normative solidarity. Better local job opportunities can counteract social mobility obstructions caused by geographically immobility.

There is much more to be done to understood the mechanisms through which internegerational solidarity contributes to the inequality and upward mobility. Welfare policies, labour market policies and educational policies should be explored jointly to complement family supports and guide young adults to make better educational and occupational decisions. A new social contract can be created so that risks and opportunities could be shared equally among individuals.

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Appendix

Appendix I Results for Baseline Models with Country Dummies

	Dependent variable:			
	upward_mobility		distance of upward mobility	
	probit		*zero-inflated count data*	
	(1)	(2)	(3)	(4)
affectual solidarity	0.063***	0.063***	0.031***	0.031***
	(0.019)	(0.019)	(0.005)	(0.005)
normative solidarity	−0.033**	−0.033**	−0.004	−0.004
	(0.015)	(0.015)	(0.004)	(0.004)
importance of friends	0.007	0.007	−0.009***	−0.009***
	(0.013)	(0.013)	(0.003)	(0.003)
trust in friends	0.068***	0.068***	0.027***	0.027***
	(0.016)	(0.016)	(0.004)	(0.004)
membership	−0.009	−0.008	0.071***	0.071***
	(0.019)	(0.019)	(0.005)	(0.005)
gender	0.140***	0.139***	0.002	0.001
	(0.013)	(0.013)	(0.003)	(0.003)
age	−0.003***	−0.003***	0.001***	0.0004***
	(0.0004)	(0.0005)	(0.0001)	(0.0001)
marital	0.086***	0.083***	0.021***	0.017***
	(0.014)	(0.014)	(0.004)	(0.004)
education of father	−0.151***	−0.151***	−0.024***	−0.024***
	(0.004)	(0.004)	(0.001)	(0.001)
cohabit		−0.016		−0.019***
		(0.016)		(0.004)
health	−0.116***	−0.116***	−0.071***	−0.071***
	(0.027)	(0.027)	(0.008)	(0.008)

factor(country)32	-1.109^{***}	-1.108^{***}	-0.156^{***}	-0.154^{***}
	(0.080)	(0.080)	(0.031)	(0.031)
factor(country)36	0.136^{**}	0.137^{**}	0.175^{***}	0.176^{***}
	(0.056)	(0.056)	(0.014)	(0.014)
factor(country)50	-0.483^{***}	-0.479^{***}	0.093^{***}	0.098^{***}
	(0.078)	(0.078)	(0.021)	(0.021)
factor(country)51	0.040	0.044	0.191^{***}	0.197^{***}
	(0.062)	(0.062)	(0.016)	(0.016)
factor(country)68	-0.052	-0.049	0.120^{***}	0.124^{***}
	(0.059)	(0.059)	(0.015)	(0.015)
factor(country)76	-0.277^{***}	-0.275^{***}	0.012	0.014
	(0.064)	(0.064)	(0.017)	(0.017)
factor(country)104	-0.743^{***}	-0.739^{***}	0.027	0.033^{*}
	(0.064)	(0.064)	(0.019)	(0.019)
factor(country)124	0.079	0.080	0.203^{***}	0.204^{***}
	(0.049)	(0.049)	(0.012)	(0.012)
factor(country)152	-0.067	-0.066	0.061^{***}	0.063^{***}
	(0.065)	(0.065)	(0.017)	(0.017)
factor(country)156	-0.469^{***}	-0.465^{***}	0.079^{***}	0.082^{***}
	(0.083)	(0.083)	(0.022)	(0.022)
factor(country)158	-0.205^{***}	-0.201^{***}	0.072^{***}	0.076^{***}
	(0.062)	(0.062)	(0.016)	(0.016)
factor(country)170	-0.134	-0.133	0.076^{***}	0.077^{***}
	(0.115)	(0.115)	(0.029)	(0.029)
factor(country)196	-0.264^{***}	-0.263^{***}	0.118^{***}	0.120^{***}
	(0.066)	(0.066)	(0.017)	(0.017)
factor(country)218	-0.067	-0.064	0.040^{**}	0.043^{**}
	(0.072)	(0.072)	(0.018)	(0.018)
factor(country)231	-0.631^{***}	-0.631^{***}	-0.210^{***}	-0.211^{***}
	(0.069)	(0.069)	(0.020)	(0.020)

factor(country)276	−0.051	−0.050	−0.181***	−0.179***
	(0.058)	(0.058)	(0.016)	(0.016)
factor(country)300	−0.214***	−0.213***	−0.136***	−0.135***
	(0.061)	(0.061)	(0.017)	(0.017)
factor(country)344	0.108**	0.112**	0.096***	0.101***
	(0.055)	(0.055)	(0.013)	(0.014)
factor(country)360	−0.423***	−0.420***	−0.085***	−0.081***
	(0.061)	(0.061)	(0.016)	(0.016)
factor(country)364	−0.227***	−0.223***	0.015	0.018
	(0.061)	(0.061)	(0.016)	(0.016)
factor(country)368	−0.315***	−0.307***	0.134***	0.144***
	(0.081)	(0.081)	(0.021)	(0.021)
factor(country)392	−0.269***	−0.266***	0.053***	0.057***
	(0.064)	(0.064)	(0.018)	(0.018)
factor(country)398	0.258***	0.260***	0.140***	0.143***
	(0.070)	(0.071)	(0.017)	(0.017)
factor(country)400	−0.281***	−0.278***	0.026	0.030*
	(0.069)	(0.069)	(0.018)	(0.018)
factor(country)404	−0.257***	−0.259***	0.049***	0.048***
	(0.070)	(0.070)	(0.019)	(0.019)
factor(country)410	0.001	0.003	−0.138***	−0.135***
	(0.062)	(0.062)	(0.016)	(0.016)
factor(country)417	0.018	0.020	0.255***	0.258***
	(0.067)	(0.067)	(0.017)	(0.017)
factor(country)422	−0.009	−0.004	0.581***	0.587***
	(0.750)	(0.750)	(0.131)	(0.131)
factor(country)434	−0.075	−0.069	0.334***	0.340***
	(0.067)	(0.067)	(0.016)	(0.016)
factor(country)446	0.155*	0.159**	0.006	0.011
	(0.081)	(0.081)	(0.019)	(0.019)

factor(country)458	0.064	0.067	0.236***	0.240***
	(0.063)	(0.063)	(0.015)	(0.015)
factor(country)484	−0.294***	−0.291***	0.176***	0.179***
	(0.062)	(0.062)	(0.016)	(0.016)
factor(country)496	0.108*	0.110*	0.112***	0.114***
	(0.057)	(0.057)	(0.014)	(0.014)
factor(country)504	−0.331***	−0.325***	−0.059***	−0.052***
	(0.062)	(0.062)	(0.016)	(0.016)
factor(country)554	0.053	0.055	0.125***	0.126***
	(0.072)	(0.072)	(0.018)	(0.018)
factor(country)558	−0.277***	−0.273***	0.002	0.006
	(0.067)	(0.067)	(0.018)	(0.018)
factor(country)566	−0.333***	−0.331***	−0.037**	−0.036*
	(0.068)	(0.068)	(0.018)	(0.018)
factor(country)586	−0.617***	−0.611***	−0.181***	−0.174***
	(0.068)	(0.068)	(0.020)	(0.020)
factor(country)604	−0.230***	−0.227***	0.154***	0.158***
	(0.063)	(0.063)	(0.016)	(0.016)
factor(country)608	−0.435***	−0.433***	−0.145***	−0.142***
	(0.061)	(0.061)	(0.017)	(0.017)
factor(country)630	0.186***	0.188***	0.182***	0.183***
	(0.068)	(0.068)	(0.016)	(0.016)
factor(country)642	−0.047	−0.044	−0.022	−0.019
	(0.064)	(0.064)	(0.017)	(0.017)
factor(country)643	0.110*	0.111*	0.084***	0.085***
	(0.063)	(0.063)	(0.016)	(0.016)
factor(country)702	−0.053	−0.048	0.115***	0.120***
	(0.055)	(0.055)	(0.014)	(0.014)
factor(country)704	−0.205***	−0.203***	0.165***	0.167***
	(0.066)	(0.066)	(0.016)	(0.016)

factor(country)716	-0.344^{***}	-0.343^{***}	-0.127^{***}	-0.126^{***}
	(0.075)	(0.075)	(0.022)	(0.022)
factor(country)762	-0.223^{***}	-0.218^{***}	0.330^{***}	0.335^{***}
	(0.063)	(0.064)	(0.016)	(0.016)
factor(country)764	-0.949^{***}	-0.943^{***}	-0.201^{***}	-0.194^{***}
	(0.063)	(0.063)	(0.020)	(0.020)
factor(country)788	-0.231^{***}	-0.228^{***}	0.062^{***}	0.065^{***}
	(0.077)	(0.077)	(0.019)	(0.019)
factor(country)792	-0.666^{***}	-0.664^{***}	0.095^{***}	0.096^{***}
	(0.056)	(0.056)	(0.015)	(0.015)
factor(country)804	0.163^{**}	0.165^{**}	0.050^{***}	0.053^{***}
	(0.067)	(0.067)	(0.018)	(0.018)
factor(country)818	-0.563^{***}	-0.561^{***}	-0.012	-0.010
	(0.072)	(0.072)	(0.020)	(0.020)
factor(country)840	-0.027	-0.028	0.159^{***}	0.158^{***}
	(0.058)	(0.058)	(0.015)	(0.015)
factor(country)862	-0.339^{***}	-0.335^{***}	0.019	0.023
	(0.066)	(0.066)	(0.018)	(0.018)
Constant	0.432^{***}	0.443^{***}	2.783^{***}	2.796^{***}
	(0.055)	(0.056)	(0.014)	(0.014)
Observations	44,617	44,617	44,617	44,617
Log Likelihood	$-29{,}418.330$	$-29{,}417.870$	$-146{,}931.700$	$-146{,}922.100$
Akaike Inf. Crit.	58,966.670	58,967.730		
Note:				*p<0.1; **p<0.05; ***p<0.01

Appendix II Results for Robustness Checks with Country Dummies

	Dependent variable:		
	extent of upward mobility		upward educational mobility
	zero-inflated count data	*hurdle*	*probit*
	(1)	(2)	(3)
affectual solidarity	0.032**	0.032**	0.066***
	(0.014)	(0.014)	(0.020)
normative solidarity	−0.006	−0.006	−0.055***
	(0.011)	(0.011)	(0.016)
importance of friends	−0.010	−0.010	0.013
	(0.009)	(0.009)	(0.013)
trust in friends	0.026**	0.026**	0.046***
	(0.011)	(0.011)	(0.016)
membership	0.072***	0.072***	0.016
	(0.014)	(0.014)	(0.020)
gender	0.001	0.0002	−0.028**
	(0.009)	(0.009)	(0.013)
age	0.001	0.001	−0.003***
	(0.0003)	(0.0003)	(0.001)
marital	0.017*	0.017*	0.075***
	(0.010)	(0.010)	(0.015)
education of father	−0.024***	−0.024***	
	(0.003)	(0.003)	
education of mother			−0.225***
			(0.004)
cohabit	−0.019	−0.018	0.005
	(0.011)	(0.011)	(0.017)
health	−0.072***	−0.071***	−0.212***
	(0.020)	(0.020)	(0.028)

factor(country)32	-0.187^{**}	-0.163^{**}	-1.268^{***}
	(0.077)	(0.075)	(0.077)
factor(country)36	0.172^{***}	0.173^{***}	-0.102^{*}
	(0.036)	(0.036)	(0.060)
factor(country)50	0.099^{*}	0.102^{*}	-0.734^{***}
	(0.055)	(0.055)	(0.082)
factor(country)51	0.197^{***}	0.198^{***}	-0.398^{***}
	(0.042)	(0.042)	(0.066)
factor(country)68	0.122^{***}	0.122^{***}	-0.153^{**}
	(0.038)	(0.038)	(0.064)
factor(country)76	0.010	0.012	-0.181^{***}
	(0.044)	(0.044)	(0.070)
factor(country)104	0.029	0.035	-0.664^{***}
	(0.049)	(0.049)	(0.067)
factor(country)124	0.202^{***}	0.203^{***}	0.039
	(0.032)	(0.032)	(0.054)
factor(country)152	0.062	0.062	-0.279^{***}
	(0.045)	(0.045)	(0.069)
factor(country)156	0.077	0.081	0.237^{**}
	(0.059)	(0.059)	(0.099)
factor(country)158	0.078^{*}	0.080^{*}	0.245^{***}
	(0.042)	(0.042)	(0.071)
factor(country)170	0.073	0.074	-0.091
	(0.078)	(0.078)	(0.124)
factor(country)196	0.120^{***}	0.122^{***}	0.022
	(0.046)	(0.046)	(0.073)
factor(country)218	0.042	0.042	-0.219^{***}
	(0.048)	(0.048)	(0.078)
factor(country)231	-0.218^{***}	-0.212^{***}	-0.556^{***}
	(0.050)	(0.050)	(0.074)

factor(country)276	-0.185^{***}	-0.185^{***}	-0.772^{***}
	(0.040)	(0.040)	(0.061)
factor(country)300	-0.139^{***}	-0.137^{***}	-0.209^{***}
	(0.042)	(0.042)	(0.066)
factor(country)344	0.102^{***}	0.102^{***}	0.095
	(0.035)	(0.035)	(0.060)
factor(country)360	-0.083^{**}	-0.080^{*}	-0.572^{***}
	(0.042)	(0.042)	(0.065)
factor(country)364	0.015	0.016	0.218^{***}
	(0.041)	(0.041)	(0.073)
factor(country)368	0.141^{**}	0.142^{**}	-0.016
	(0.056)	(0.056)	(0.088)
factor(country)392	0.053	0.055	-0.161^{**}
	(0.046)	(0.046)	(0.067)
factor(country)398	0.145^{***}	0.145^{***}	0.002
	(0.046)	(0.046)	(0.074)
factor(country)400	0.027	0.029	-0.022
	(0.047)	(0.047)	(0.078)
factor(country)404	0.045	0.047	-0.190^{**}
	(0.049)	(0.049)	(0.075)
factor(country)410	-0.144^{***}	-0.144^{***}	0.327^{***}
	(0.041)	(0.041)	(0.072)
factor(country)417	0.256^{***}	0.257^{***}	-0.521^{***}
	(0.046)	(0.046)	(0.071)
factor(country)422	0.596	0.597	3.389
	(0.430)	(0.430)	(20.612)
factor(country)434	0.336^{***}	0.337^{***}	-0.185^{**}
	(0.044)	(0.044)	(0.073)
factor(country)446	0.009	0.009	0.226^{**}
	(0.049)	(0.050)	(0.093)

factor(country)458	0.243^{***}	0.243^{***}	-0.344^{***}
	(0.040)	(0.040)	(0.066)
factor(country)484	0.178^{***}	0.180^{***}	-0.157^{**}
	(0.043)	(0.043)	(0.068)
factor(country)496	0.114^{***}	0.113^{***}	0.059
	(0.038)	(0.038)	(0.061)
factor(country)504	-0.054	-0.052	-0.524^{***}
	(0.042)	(0.042)	(0.066)
factor(country)554	0.121^{**}	0.122^{**}	-0.126^{*}
	(0.049)	(0.049)	(0.076)
factor(country)558	0.005	0.007	-0.461^{***}
	(0.046)	(0.046)	(0.071)
factor(country)566	-0.038	-0.036	-0.807^{***}
	(0.047)	(0.047)	(0.072)
factor(country)586	-0.180^{***}	-0.174^{***}	-0.706^{***}
	(0.050)	(0.050)	(0.072)
factor(country)604	0.157^{***}	0.159^{***}	-0.268^{***}
	(0.043)	(0.043)	(0.068)
factor(country)608	-0.146^{***}	-0.143^{***}	-0.688^{***}
	(0.043)	(0.043)	(0.065)
factor(country)630	0.179^{***}	0.179^{***}	0.148^{**}
	(0.044)	(0.044)	(0.074)
factor(country)642	-0.022	-0.021	-0.341^{***}
	(0.043)	(0.043)	(0.068)
factor(country)643	0.086^{**}	0.086^{**}	-0.230^{***}
	(0.043)	(0.043)	(0.066)
factor(country)702	0.118^{***}	0.119^{***}	0.152^{**}
	(0.036)	(0.036)	(0.062)
factor(country)704	0.166^{***}	0.168^{***}	-0.047
	(0.044)	(0.044)	(0.072)

factor(country)716	-0.133^{**}	-0.131^{**}	-0.535^{***}
	(0.054)	(0.054)	(0.079)
factor(country)762	0.338^{***}	0.339^{***}	-0.773^{***}
	(0.045)	(0.045)	(0.066)
factor(country)764	-0.210^{***}	-0.198^{***}	-0.861^{***}
	(0.050)	(0.050)	(0.065)
factor(country)788	0.063	0.064	0.202^{**}
	(0.051)	(0.051)	(0.093)
factor(country)792	0.093^{**}	0.096^{**}	-0.742^{***}
	(0.040)	(0.040)	(0.059)
factor(country)804	0.053	0.053	-0.158^{**}
	(0.045)	(0.045)	(0.071)
factor(country)818	-0.014	-0.011	-0.327^{***}
	(0.052)	(0.051)	(0.078)
factor(country)840	0.157^{***}	0.157^{***}	-0.040
	(0.039)	(0.039)	(0.061)
factor(country)862	0.022	0.024	-0.227^{***}
	(0.047)	(0.047)	(0.071)
Constant	2.790^{***}	2.790^{***}	1.189^{***}
	(0.038)	(0.038)	(0.061)
Observations	44,617	44,617	44,617
Log Likelihood	$-110{,}607.200$	$-109{,}570.600$	$-26{,}011.770$
Akaike Inf. Crit.			52,155.530

Note: *p<0.1; **p<0.05; ***p<0.01

Appendix III Country Code

8 Albania
12 Algeria
16 American Samoa
20 Andorra
24 Angola
28 Antigua and Barbuda
32 Argentina
51 Armenia
36 Australia
40 Austria
31 Azerbaijan
50 Bangladesh
52 Barbados
56 Belgium
60 Bermuda
64 Bhutan
68 Bolivia
70 Bosnia
72 Botswana
76 Brazil
84 Belize
100 Bulgaria
854 Burkina Faso
108 Burundi
112 Belarus
116 Cambodia
120 Cameroon
124 Canada
148 Chad
152 Chile
156 China
170 Colombia
384 Côte d Ivoire
184 Cook Islands
188 Costa Rica
191 Croatia
192 Cuba
196 Cyprus
203 Czech Republic
180 Dem. Rep. of Congo
208 Denmark
214 Dominican Republic
818 Egypt
218 Ecuador
222 El Salvador
226 Equatorial Guinea
231 Ethiopia
232 Eritrea
233 Estonia
246 Finland
250 France
268 Georgia
270 Gambia
624 Guinea-Bissau
276 Germany
288 Ghana
292 Gibraltar
300 Greece
320 Guatemala
324 Guinea
328 Guyana
826 Great Britain
332 Haiti
340 Honduras
344 Hong Kong
348 Hungary
352 Iceland
356 India
360 Indonesia
364 Iran
368 Iraq
372 Ireland
376 Israel
380 Italy
400 Jordan
388 Jamaica
392 Japan
398 Kazakhstan
404 Kenya
414 Kuwait
417 Kyrgyzstan
418 Laos
422 Lebanon
426 Lesotho
428 Latvia
430 Liberia
434 Libya
450 Madagascar
454 Malawi
458 Malaysia
466 Mali
470 Malta
474 Martinique
478 Mauritania
480 Mauritius
484 Mexico
492 Monaco
496 Mongolia
498 Moldova
504 Morocco
508 Mozambique
104 Myanmar
912 Montenegro
807 Macedonia
516 Namibia
524 Nepal
528 Netherlands
554 New Zealand
558 Nicaragua
562 Niger
566 Nigeria
578 Norway
408 North Korea
512 Oman
586 Pakistan
591 Panama
598 Papua New Guinea
600 Paraguay
604 Peru
608 Philippines
616 Poland
620 Portugal
275 Palestine
630 Puerto Rico
634 Qatar
642 Romania
643 Russia
646 Rwanda
682 Saudi Arabia
144 Sri Lanka
686 Senegal
690 Seychelles
694 Sierra Leone
702 Singapore
703 Slovakia
705 Slovenia
706 Somalia
710 South Africa
724 Spain
736 Sudan
740 Suriname
752 Sweden
756 Switzerland
760 Syria
410 South Korea
891 Serbia and Montenegro
911 Serbia
626 Timor-Leste
762 Tajikistan
764 Thailand
768 Togo
780 Trinidad
788 Tunisia
158 Taiwan
792 Turkey
795 Turkmenistan
834 Tanzania
784 United Arab Emirates
800 Uganda
804 Ukraine
840 United States
850 U.S. Virgin Islands
858 Uruguay
860 Uzbekistan
704 Viet Nam
862 Venezuela
887 Yemen
894 Zambia
716 Zimbabwe