Work4Youth
Publication Series
No. 30

International Labour Office

The MasterCard Foundation

It runs in the family: Intra-household correlations in labour market outcomes

Björn Nilsson

November 2015

Youth Employment Programme
Employment Policy Department

Work4Youth Publication Series No. 30

It runs in the family: Intra-household correlations in labour market outcomes

Björn Nilsson

International Labour Office ● Geneva

November 2015

ILO Cataloguing in Publication Data

Nilsson, Björn

It runs in the family : intra-household correlations in labour market outcomes / Björn Nilsson ; International Labour Office. - Geneva: ILO, 2015

Work4Youth publication series ; No. 30; ISSN 2309-6780; 2309-6799 (web pdf)

International Labour Office

youth employment / entry into working life / labour market / labour mobility / work experience / household / role of ILO / Africa south of Sahara / Central Asia / Eastern Europe / South Asia / South East Asia

Cover design by: Creative Cow

Printed by the International Labour Office, Geneva, Switzerland

Preface

Youth is a crucial time of life when young people start realizing their aspirations, assuming their economic independence and finding their place in society. The global jobs crisis has exacerbated the vulnerability of young people in terms of: (i) higher unemployment, (ii) lower quality jobs for those who find work, (iii) greater labour market inequalities among different groups of young people, (iv) longer and more insecure school-to-work transitions, and (v) increased detachment from the labour market.

In June 2012, the International Labour Conference of the ILO resolved to take urgent action to tackle the unprecedented youth employment crisis through a multi-pronged approach geared towards pro-employment growth and decent job creation. The resolution "The youth employment crisis: A call for action" contains a set of conclusions that constitute a blueprint for shaping national strategies for youth employment.[1] It calls for increased coherence of policies and action on youth employment across the multilateral system. In parallel, the UN Secretary-General highlighted youth as one of the five generational imperatives to be addressed through the mobilization of all the human, financial and political resources available to the United Nations (UN). As part of this agenda, the UN has developed a System-wide Action Plan on Youth, with youth employment as one of the main priorities, to strengthen youth programmes across the UN system.

The ILO supports governments and social partners in designing and implementing integrated employment policy responses. As part of this work, the ILO seeks to enhance the capacity of national and local-level institutions to undertake evidence-based analysis that feeds social dialogue and the policy-making process. To assist member States in building a knowledge base on youth employment, the ILO has designed the "school-to-work transition survey" (SWTS). The current report, which uses the rich datasets of the SWTS to explore intra-household linkages and address the degree to which young people's labour market and schooling outcomes are affected by those of their siblings, is a product of a partnership between the ILO and The MasterCard Foundation. The paper was selected for presentation at the first W4Y Global Research Symposium on "Labour market transitions of young women and men: Innovative research from 28 school-to-work transition surveys" held in Geneva in March 2015.

It is not an easy time to be a young person in the labour market today. The hope is that, with leadership from the UN system, with the commitment of governments, trade unions and employers' organizations and through the active participation of donors such as The MasterCard Foundation, the international community can provide the effective assistance needed to help young women and men make a good start in the world of work. If we can get this right, it will positively affect young people's professional and personal success in all future stages of life.

Azita Berar Awad
Director
Employment Policy Department

[1] The full text of the 2012 resolution "The youth employment crisis: A call for action" can be found on the ILO website at: www.ilo.org/ilc/ILCSessions/101stSession/texts-adopted/WCMS_185950/lang--en/index.htm.

Contents

Tables

Figures

Acknowledgements

The author would like to express his gratitude to the participants in the 9th European Development Research Network (EUDN) PhD conference in Hannover (2014), and to participants in the Work4Youth Global Research Symposium held in Geneva 2015 for helpful comments and suggestions. Valentina Barcucci and Marco Principi of the ILO Work4Youth team offered invaluable support in providing feedback and finalizing the document for publication.

In addition, the ILO would like to acknowledge the support of The MasterCard Foundation in allowing the research to move forward, under the scope of the Work4Youth partnership.

1. Introduction

A crucial question for policy-makers is how to facilitate successful transitions from school into the labour market. Over the past few decades, many countries have invested heavily in education and made significant progress in improving access to education, and not just at the primary level. However, these increased educational opportunities have not always succeeded in creating decent employment for young people, who are over-represented in informal employment, precarious contractual conditions and other situations of vulnerability. Therefore, understanding the drivers of successful labour market transitions is key to developing efficient policy tools to support youth in transition.

Event histories, whether arising from panel data or retrospective surveys, have frequently been used to study labour market transitions and, in particular, the issue of past dependence. From a social planner's perspective, it is highly relevant to know how an individual's past education and labour market history affects the set of probable future outcomes he or she is facing. Knowing whether a past unemployment spell will increase or decrease the probability of future employment, the quality of this employment or the decision to return to education will help to identify individual labour market strategies, which in turn aid in the development of effective policy measures. With these considerations in mind, unemployment scarring and welfare dependence are among the topics most frequently researched. This strand of the literature, however, neglects the influence of intra-household peer effects.

In the psychological literature, siblings have been shown to exert influence on one another in such areas as fertility (Lyngstad and Prskawetz, 2010) and career decision-making (Palladino Schultheiss et al., 2001; Palladino Schultheiss et al., 2002). The theory that young people's labour market and schooling outcomes are affected by those of their siblings, whether through joint decision-making (or by a family member with overall authority for decision-making), imitation, information sharing or any other mechanism, has recently been explored by Lindskog (2011) using data from the Ethiopian Highlands. While transitions into the labour market have generally been studied extensively, this has been less evident in developing countries. Notable exceptions which use a survival framework include Chuang (1999), Assaad et al. (2010) and Nordman and Pasquier-Doumer (2013).

This study examines the impact of individuals' labour market experiences, in terms of both quantity and quality, on the labour market trajectories of their fellow household members. Using a recent ILO survey (the SWTS) run in 28 developing and transition countries, we investigate the impact of sibling experience on individual outcomes, focusing on the following groups of countries: Sub-Saharan Africa, Eastern Europe and Central Asia, and South-East Asia and South Asia.[2] Section 2 reviews the literature on labour market determinants, labour market transition modelling and sibling correlations in socio-economic outcomes. Section 3 presents the data used. Section 4 summarizes the current status of youth in transition in the three groups of countries. Section 5 introduces a multinomial logit model addressing sibling dependency. Section 6 introduces the survival analysis framework and discusses problems of hypothesis sensitivity. The last section presents concluding remarks on the findings.

[2] Hereafter, and for the sake of brevity, this paper will refer to the region of South-East Asia and South Asia as "Asia".

2. Literature review

2.1 Determinants of successful labour market outcomes

There is a substantial interdisciplinary literature on the determinants of success in the job market. Regarding links between education and the labour market, the starting point in economics of education remains the seminal works of Mincer (1958), Schultz (1960) and Becker (1962), all of which consider educational attainment as a type of capital, accumulated through investment determined by the rational behaviour of individuals. Like physical capital, education yields a return in the sense that it leads (among other things) to a better job with a higher wage. Rational individuals will compare expected lifetime earnings, conditional on human capital, with the cost of education and educate themselves until the net present cost of education equals the net present gain from the resulting human capital accumulation. The fact that education carries a wage premium is well established (Psacharopoulos and Patrinos, 2004), regardless of whether this result derives from the development of cognitive or non-cognitive skills, narrow or broad skills or a pure signalling phenomenon.

Other features of the labour market experience have also been linked to educational attainment. Mincer (1991) finds that educational attainment is associated with a lower incidence of unemployment. More highly educated workers have a greater attachment to the firms in which they are employed, and are less at risk of being unemployed when separated from those firms. Evidence that education decreases the incidence of unemployment has been found more recently by Lauer (2003), Riddell and Song (2011) and Schmillen and Möller (2012). In a paper focusing on the impact of social benefits on the transition from unemployment to employment, Bover et al. (2002) find that holding a university degree increases the overall hazard rate of transition at the beginning of a spell, but lowers it below that of less well-educated workers after the third month of unemployment.

The vast and growing literature on social networks has established a firm link between labour market dynamics (including wages) and friends and acquaintances, prevailing in virtually all labour markets studied (Jackson, 2010). Access to information is seen as the main driver of this correlation, since an important proportion of jobholders find their jobs through their social networks. Calvó-Armengol and Jackson (2010) point out that duration dependence is also inherently linked to networks, since the longer workers remain in unemployment, the less likely they are to have a large number of employed friends to provide information about job opportunities.

The relative homogeneity of social networks can also be utilized by employers, as in the case of employee referrals used in the hiring process (Montgomery, 1991). Hensvik and Nordström Skans (2013) apply Montgomery's model to Swedish data using scores from cognitive and non-cognitive tests as indicators of productivity, showing that both the hiring process and wage setting of firms conform to model predictions. Pellizzari (2010), using data on European households, also finds evidence of such mechanisms, demonstrating that job market matches that come about through informal methods (such as referrals) are of better quality and are associated with higher wages than those which utilize formal channels. Empirical studies from developing countries are relatively scarce. Fafchamps and Minten (2002) do, however, highlight the importance of social networks in the success of entrepreneurs in Madagascar. Nordman and Pasquier-Doumer (2013) study the impact of social networks in Burkina Faso using a competing risk framework.

Their evidence suggests that social networks, defined by network size and strength of ties, are significantly correlated with labour market transitions.

Family size and birth order effects have been shown to affect educational outcomes, with inequalities likely to persist in the labour market. In particular, Becker and Lewis (1973) famously suggested a quantity–quality trade-off in children, which implied that larger families should have, on average, less well-educated children. This is partially confirmed in the literature (Blake, 1981; Hanushek, 1992), although the exogeneity of family size has been questioned, parents being likely to transmit endowment to their children in other forms than through investment in education (de Haan, 2010). Birth order effects on schooling and other socio-economic outcomes have also been suggested, in particular through the confluence model, by which a child's intellectual environment is decreased in quality with each sibling born. Behrman and Taubman (1986) and Black et al. (2005) have found negative birth order effects that support this concept. When the household is considered as a production unit, siblings may also enter into direct competition with one another. In the framework set by Emerson and Souza (2008), older siblings may command higher wages in the child labour market and thus relax constraints on the household budget, making it possible for younger siblings to attend school. Their work is a reminder of the importance of distinguishing economies that have a tendency to utilize child labour from economies without child labour.

Endogeneity is a recurrent problem arising in any attempt to understand educational and labour dynamics within the household. If households are conceived as being headed by a planner, who optimizes the allocation of education, work and inactivity of all household members according to some unknown household utility function, identification of the impact of education on labour market success will be compromised since those who are chosen for education might also be those who are most likely to succeed in the labour market, based on some unobservable characteristics. Instrumenting education by family background variables (such as parental education, parental labor market status, and family size and composition) has been challenged on these grounds, as well as on the grounds that these instruments are unlikely to verify the strict exogeneity assumption. Thus, instrumental variables (IV) estimates of the impact of education on earnings have been found to be systematically higher than standard ordinary least squares (OLS) estimates (Psacharopoulos and Patrinos, 2004).

Intuitively, cognitive skills should be linked to productivity and therefore to labour market success. Some measure of cognitive skills, such as test scores, is often found to be significantly positively correlated to labour market achievement and, in particular, wages. The evidence from developing countries on the importance of cognitive skills is, however, scarce and inconclusive; nevertheless, that which is available is indicative of important wage returns to cognitive skills (Behrman et al., 2008; Hanushek, 2009).

The preference theory of Hakim (2000) suggests that differences in labour market outcomes of women are, to a large degree, attributable to individual preferences related to the optimal work and family life combination. This theory has been challenged (McRae, 2003) on the grounds that women are unequal in their capacity to overcome obstacles and that this inequality, rather than expression of preferences, is what discriminates between outcomes. Using a longitudinal survey data set from Sweden, Golsteyn et al. (2014) show that time preferences are correlated with educational choice, labour supply and lifetime income, the operating mechanism being early investment in human capital. Reuben et al. (2013) use experimental data to examine the link between preferences for competitiveness and risk and college major choice and expected future earnings. They find that 18 per cent of the gender gap in expected earnings can be explained by gender differences in their measures of competitiveness and risk.

2.2 Labour market transitions and past dependence

Survival analysis has been used extensively to study labour market dynamics, particularly in developed countries. In broad terms, this setting permits the study of two types of influence on transition lengths: the impact of covariates on the transition, and the impact of the duration and contents of the transition itself. As such, duration dependence (including lagged duration dependence) and state dependence are the factors most strongly emphasized. Heckman and Borjas (1980) study unemployment duration using four types of dependence. First, Markovian state dependence, where transition probabilities differ based solely on the category to which the individual belongs. They also test for occurrence dependence, duration dependence and lagged duration dependence, showing that identification criteria differ according to the type of dependence stipulated.

The determinants of unemployment duration have been studied by Ham and Rea Jr (1987) in the Canadian context, who found that duration decreases the probability of leaving the state of unemployment, holding benefits constant. Evidence pointing in the same direction has been found in Britain (Lynch, 1985), Australia (Doiron and Gørgens, 2008) and the Netherlands (Frijters et al., 2009). Time to first job, the particular focus of this report, has also been extensively studied in the duration analysis setting. Dolton et al. (1994) evaluate the impact of youth training schemes in Britain, finding that these have positive effects on transition rates for women, but not for men. Salas-Velasco (2007) looks at school-to-work transitions for higher education graduates in Europe, finding important geographical differences. Spanish and Italian graduates are shown to have difficulties in finding a first job, while graduates from the United Kingdom and the Nordic countries find one relatively easily. Furthermore, being male, young and with relatively well-educated parents also favours the transition probability.

The use of duration models to study labour market dynamics in developing or transition countries is less common. Galiani and Hopenhayn (2003) consider unemployment duration in Argentina, using a Markovian framework with duration dependence. They find evidence that the probability of transiting to employment decreases with increasing duration of unemployment. Sayre and Daoud (2009) find that unemployment duration patterns vary considerably between the sexes in the Occupied Palestinian Territory. The school-to-work transition per se has been studied in Taiwan, China by Chuang (1999), in Egypt by Assaad et al. (2010), in Burkina Faso by Calvès et al. (2013) and in Malaysia by Lim (2011). UCW (2015), using the ILO SWTS, the authors analyse transitional dynamics in low- and middle-income countries using a split population model, which has the advantage of permitting individuals never to transit.[3] They find that a substantial share of individuals in the countries studied will never experience a transition to employment, and that an even higher share will never experience transition to stable employment (the shares are particularly high in sub-Saharan Africa). Being a female and having low educational attainment also negatively influence the probability of ever transiting, both to any employment and to stable employment.

[3] Standard duration models treat all individuals who do not experience the transition by the end of the study as censored, assuming that they will all experience the transition at one point in time. The split population model relaxes this assumption, by allowing individuals not to transit. However, it also excludes censored observations from the hazard estimation, which is potentially an equally influential assumption.

2.3 Sibling correlations in education and in the labour market

Sociologists have been studying sibling resemblance empirically for many years. As reported by Conley and Glauber (2007), within-family allocative models, such as those of Becker and Tomes (1994) or Behrman et al. (1989), provide a theoretical framework for analysing sibling correlations over time, when these correlations result from parental investment behaviour. In the Becker and Tomes model, parents may be concerned to equalize the net wealth of their children, and will thus invest differentially in human capital and bequests according to the individual endowments of their children (it being assumed that these are known to the parents). This leads to a prediction of sibling correlations in future wealth, rather than education, income or earnings. The Behrman et al. (1989) model posits that parents are concerned with child earnings rather than wealth, with a constant elasticity of substitution parental welfare function. They have equal preferences across children and are willing to trade off the earnings of one child for that of another with elasticity *c*. A parameter *b* is subtracted from the earnings of each child to provide a minimal value of earnings below which parents are unwilling to make trade-offs. They consider two effects leading to contrasting predictions in terms of sibship size on sibling earnings correlations. First, a "preference displacement effect" where increased sibship size means that fewer resources are available for each child, thus reducing the amount of investment for which parents are willing to make trade-offs. This should lead to increased sibling correlations in terms of education and, subsequently, earnings. Second, a price effect, based on the hypothesis that larger families are more frequently eligible for scholarships, implying that variation in educational outcomes increases with family size, assuming that children have different endowments and that schooling prices are related to these endowments. This premise should therefore lead to decreased sibling correlations in education and earnings.

Conley and Glauber (2007) give an account of the theoretical considerations of sibling resemblance across the life course, based on the previous frameworks. These models lead to a prediction of increasing correlations over the life course, since it is the final long-term economic situation of the child that is the preoccupation of parents, with alternative strategies based on endowment differentials being used to achieve these goals. At the same time, it seems plausible that parental investment decisions play a more important role at the beginning of the life course, being subsequently replaced by social network effects. Solon et al. (1991) look at sibling correlations using analysis of variance, decomposing variance in earnings into a permanent family component, a permanent individual component and a transitory component, interpreting the share of the family component as the sibling correlation coefficient of permanent earnings. Arguing that the absence of longitudinal data, and thus a measure of the transitory component of variance, has led to a downward bias in previous studies, they examine US earnings from the Panel Study of Income Dynamics (of wages from 1975 through 1982) and find the permanent correlation in brothers to be 0.342, or 0.448 when accounting for serial correlation in transitory earnings. Levine and Mazumder (2007), using the same method, estimate the brothers' earnings correlation coefficient to be 0.263 for cohorts entering the labour market in the 1970s and 0.452 for cohorts entering in the 1980s and early 1990s. The estimates of Conley and Glauber (2007) are very close to those of Solon et al. (1991).

As stated by Ryan (2001), school-to-work transitions have in recent years become a research topic of interest in the economic literature, being associated with "change, waiting and uncertainty". Reviewing the evidence from seven developed countries, he notes that substantial deterioration of the labour market situation has taken place in some countries, giving the example of France, where 86 per cent of youth in 1973 were in employment 9 months after leaving school, whereas in 1992 the percentage had dropped

to 19 per cent, 3 years after leaving school. While choosing to focus on school-to-work transitions does target a specific subset of the population, i.e. youth who have left the educational system, it synthesizes a number of interrogations including, but not limited to, past dependence, educational quality, job quality, scarring, job shopping and the nature of the job-search process more generally. Although the starting point of the transition is generally identified as the point when the individual leaves the educational system, the end point is less precisely defined. The Organisation for Economic Co-operation and Development (OECD) adopts a straightforward approach, considering all individuals in stable full-time employment as having transited (Ryan, 2001). A slightly different approach is preferred by the ILO, defining transited individuals as those who are in stable and/or satisfactory employment (including self-employment when satisfactory; Elder and Koné (2014)).

Evidence from the process by which individuals move into and out of different states in the labour market is therefore necessary to inform effective policy-making. Although labour market transitions have been studied fairly extensively in the context of developed countries, fewer studies have been undertaken in the developing world; exceptions include Orazem (2007), Assaad et al. (2010), Pugatch (2012) and Calvès et al. (2013).

3. Data

The data used to compile this report originate from a set of school-to-work transition surveys (SWTS) run by the ILO under the Work4Youth project. The survey was implemented in collaboration with national statistical institutes in 28 countries,[4] targeting youth from 15 to 29 years of age. In addition to information on family composition and current educational and labour market status, the survey provides information on the labour market careers of those individuals who have left school, from their date of exit from the educational system up to their current labour market situation. This section contains brief formal education and training information, as well as the activity history and aspirations of youth, captured through retrospective questions. In the analysis for this report we are using four sub-Saharan African (SSA) countries – Benin, Liberia, Malawi and the United Republic of Tanzania, with nationally representative data. In total, data from these countries contain 13,511 observations (see table 3.1). In addition, we are using four Eastern Europe and Central Asian (EECA) countries: Armenia, FYR Macedonia, Kyrgyzstan and Ukraine, with a total of 13,216 observations. Finally, we analyse three countries in Asia: Cambodia, Nepal and Viet Nam, with a total of 9,822 observations in the data set.

[4] Namely, Armenia, Bangladesh, Benin, Brazil, Cambodia, Colombia, Egypt, El Salvador, Jamaica, Jordan, Kyrgyzstan, Liberia, the former Yugoslav Republic of Macedonia, Madagascar, Malawi, the Republic of Moldova, Nepal, Occupied Palestinian Territory, Peru, the Russian Federation, Samoa, Togo, Tunisia, Uganda, Ukraine, United Republic of Tanzania, Viet Nam and Zambia.

Table 3.1 Total sample sizes and reference period, by country

Country	Full sample	Reduced sample	Reference period
SSA	13 511	12 789	August 2012 – March 2013
Benin	6 917	6 917	November–December 2012
Liberia	1 504	1 108	August–September 2012
Malawi	3 102	2 784	August–September 2012
Tanzania, United Rep.	1 988	1 980	February–March 2013
EECA	13 216	11 370	July 2012 – September 2013
Armenia	3 216	2 575	October–November 2012
Kyrgyzstan	3 930	3 483	July–September 2012
FYR Macedonia	2 544	2 880	July–September 2013
Ukraine	3 526	2 432	February 2013
Asia	9 822	7 388	July 2012 – May 2013
Cambodia	3 552	2 458	July–August 2012
Nepal	3 548	2 454	April–May 2013
Viet Nam	2 722	2 476	December 2012 – January 2013
Total	36 549	31 547	July 2012 – September 2013

Source: ILO SWTS data.

The surveys were carried out over periods which were close in time, spanning 14 months from July 2012 to September 2013. For each spell in the labour market, the event history module contains information on the start and end dates of the spell, the employment status of the individual (including inactivity for various reasons), the type and duration of the contract or informal agreement governing employment, the level of satisfaction expressed by the individual associated with that spell and, for all spells except the last observed one, the reason for event termination. As a result, we have a set of right-censored observations with start and end dates expressed in months and years. The labour market history data enable us to construct length of unemployment, length of temporary or self-employment and length of inactivity variables for young people who have left (or never started) school. Finally, a set of variables is created corresponding to the average labour market experiences of siblings who are not in school and are still living in the household.

A potential source of bias in our samples relates to the number of siblings surveyed in each household. The choice of countries in the sample is determined by the existence of reliable household identifiers, as well as variables related to the number of eligible siblings per household. For consistency, we systematically retain only those households where all eligible household members were surveyed. This could potentially lead to another source of bias if households with a large number of respondents were more likely to be households with non-surveyed eligible members. However, a comparison between included and excluded household sizes suggests that this is not a serious problem.

The survey does not permit a direct identification of siblings. We do, however, know the relationship of each individual to the head of the household. We therefore consider as siblings those individuals who declare themselves to be sons and daughters of the head of the household (as a consequence we do not know whether our siblings share both parents or only one). In the following sections we present regressions on two samples: siblings only and the full sample. Summary statistics based on sons and daughters of the heads of households are provided in the Annex.

The data provide the date when individuals left school. However, this date does not always coincide with the first date reported in the labour market history module (although

the module allows for inactivity). Furthermore, in Malawi, only those with completed education filled in the date of leaving school. To limit bias linked to missing information, and since we do not know whether the individuals actively searched for jobs during the transition period between leaving school and starting their first period of activity, we simply consider as non-employment any period between the school leaving date and the first labour market experience, where such a gap exists. Similarly, the date of the first activity in the labour market history module may precede the school leaving date, since it is possible that individuals are working during their schooling, or go back and forth between schooling and labour market activity.

We limit the transitions of interest to those occurring after individuals have left school. Out of the 12,705 individuals who have left school and for whom we have information both on the date of leaving and the date of the first activity in the transition, 717 (5.6 per cent) individuals declared an activity that started prior to leaving school, 7,561 (59.5 per cent) declared their first spell during the same month as leaving school and 4,427 individuals declared their first activity to have started later than the month during which they left school. Out of the 7,561 individuals who declared their first spell during the same month as leaving school, 3,316 (43.8 per cent) declared themselves to be either inactive or in unemployment. This leaves a total of 4,245 (56.1 per cent) individuals who experienced a direct transition into employment, apprenticeship or adult education.

4. Youth in the labour market

4.1 SSA countries

The concept of school-to-work transition is nuanced within the African context since a sizable share of youth remains without access to schooling, a situation which should be a priority for policy-makers. The share of youth who never attended school varies widely between countries, ranging from 1.5 per cent in the United Republic of Tanzania to 28.8 per cent in Benin (Elder and Koné, 2014). Table 4.1 indicates that individuals in the sample are, on average, around 21 years old, more often female than male, and that some 27 per cent are married. A total of 33 per cent have children and the average number of household respondents is 2.25. However, these figures do not reflect the number of siblings in the household, since those siblings who are below the age of 15 or above the age of 29 are ineligible for the survey. Some 82 per cent of youth have attended school at least once in their lifetime, with 46 per cent currently enrolled. Out of individuals who have left school, 77 per cent have done so with at least a completed elementary education. University degrees are a rare phenomenon, reported by only 2.7 per cent of respondents who have left school. Unemployment stands at 12.3 per cent (24.1 per cent when applying the relaxed definition of unemployment). Out of the total of relaxed unemployed, some 13.5 per cent belong to the discouraged youth category, meaning that they did not search for work during the reference week for reasons that imply discouragement.[5]

There is considerable variation in socio-demographic characteristics across countries. The extent to which youth have completed their primary studies, for example,

[5] According to the ILO, discouragement is defined as a situation in which a young person is available to work but does not search for work for a reason implying discouragement with their employment options (Elder and Koné, 2014).

varies considerably. In Malawi, about half of those who left school did so before finishing elementary education. In Benin, however, everyone who went to school left after completing their elementary education. The stages of transition[6] also bear witness to heterogeneous labour market trajectories in Africa, with only 18 per cent of youth having transited in Benin, compared to 40 per cent in Malawi. The headcount of successfully transited youth should be cautiously interpreted here since a young person pursuing secondary or tertiary education will postpone their entry into the labour market, and thus their transition. Looking instead at ratios of transited individuals to those who have started their transition, the lowest ratio is found in the United Republic of Tanzania, where 39 per cent of those who have started their transition have also completed their transition (the highest ratio is 48 per cent, in Malawi). The opportunities for a stable and or satisfactory employment on leaving school are thus clearly contingent on the country under consideration.

Table 4.1 Summary statistics, SSA (all household members)

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
Age	12 789	20.804	4.397	15	29
Male	12 789	0.492	0.5	0	1
Married	12 789	0.274	0.446	0	1
Children	12 789	0.332	0.471	0	1
Respondents	12 789	2.248	1.307	1	10
Ever in school	12 789	0.816	0.387	0	1
Currently in school	12 789	0.455	0.498	0	1
Elementary education*	5 639	0.77	0.421	0	1
Secondary education*	5 639	0.299	0.458	0	1
Tertiary education*	5 639	0.027	0.163	0	1
In the labour force	12 789	0.433	0.496	0	1
In the labour force (relaxed)	12 789	0.501	0.5	0	1
Employed	5 542	0.877	0.329	0	1
Unemployed	5 542	0.123	0.329	0	1
Unemployed (relaxed)	6 404	0.241	0.428	0	1
Discouraged	1 545	0.135	0.342	0	1
Transited	12 214	0.251	0.434	0	1
In transition	12 214	0.318	0.466	0	1
Transition not started	12 214	0.431	0.495	0	1

Note: * Completed educational level, for those who have left school.
Source: Author's calculations based on ILO SWTS data.

[6] We are using the ILO definition of transitions here, meaning that a transited individual is one that is either in (a) a stable and satisfactory job; (b) a stable but non-satisfactory job; (c) a satisfactory but temporary job; or (d) in satisfactory self-employment. A stable job refers to a job with a contract that is of unlimited duration or of more than 12 months' duration. A satisfactory job is one in which the individual declares themselves to be somewhat or very satisfied. A transition that has not yet started corresponds to youth who are still in school or youth who are inactive and have no intention of looking for work later. Individuals in transition comprise the rest of youth in the sample, namely (a) the unemployed; (b) currently employed in a temporary and non-satisfactory job; (c) currently self-employed and unsatisfied; and (d) currently inactive and not in school, with the intention of looking for work later.

4.2 EECA countries

EECA youth are, on average, slightly older than their SSA counterparts; probably reflecting the radically different stages of demographic transition of the two groups of countries. This is also reflected in the number of young people with children, lower in the EECA countries (although the proportion of young married people is similar). The number of respondents is lower, which probably reflects a scenario of smaller households in these countries. Schooling is almost universal (although we do not have precise data for Ukraine) with an average school attainment level which is much higher than that of the SSA sample. Labour force participation is similar to that in the SSA countries, albeit with a significantly higher unemployment rate. In terms of transition stages, the EECA countries boast a higher absolute share of transited youth, as well as a higher ratio of transited to in-transition youth. Between countries, there is marked variation in terms of employment prospects. Youth unemployment is a serious issue in Armenia and Macedonia (32 per cent and 40 per cent respectively), while it appears to be a less serious problem in Kyrgyzstan (6 per cent). Related to unemployment figures, the share of successfully transited youth is high in Kyrgyzstan (and also in Ukraine), while it remains low in Armenia and Macedonia.

Table 4.2 Summary statistics, EECA (all household members)

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
Age	11 370	21.619	4.292	15	29
Male	11 370	0.495	0.5	0	1
Married	11 370	0.255	0.436	0	1
Children	11 370	0.23	0.421	0	1
Respondents	11 370	1.716	0.83	1	6
Ever in school	11 370	0.996	0.062	0	1
Currently in school	11 370	0.454	0.498	0	1
Elementary education*	6 126	0.995	0.071	0	1
Secondary education*	6 126	0.767	0.423	0	1
Tertiary education†	6 126	0.245	0.43	0	1
In the labour force	11 370	0.486	0.5	0	1
In the labour force (relaxed)	11 370	0.514	0.5	0	1
Employed	5 522	0.788	0.409	0	1
Unemployed	5 522	0.212	0.409	0	1
Unemployed (relaxed)	5 847	0.256	0.436	0	1
Discouraged	1 496	0.102	0.303	0	1
Transited	11 332	0.34	0.474	0	1
In transition	11 332	0.274	0.446	0	1
Transition not started	11 332	0.386	0.487	0	1

Note: * Completed educational level, for those who have left school. † Completed educational level, for those who have left school (excluding Kyrgyzstan, where all tertiary education was labelled as vocational).
Source: Author's calculations based on ILO SWTS data.

4.3 Countries in Asia

The Asia sample is positioned somewhere in between the SSA and EECA samples, in line with its relative position in the human development index. Youth are older than in the SSA sample and slightly younger than those in the EECA sample. The number of respondents is lower than in SSA and slightly higher than in EECA. Average educational attainment level is also positioned between those of the other two samples; while elementary schooling is almost universal, only some 44 per cent have completed secondary education (in comparison with 77 per cent in the EECA sample). A total of 11 per cent hold a tertiary degree, a result which again falls in between the two other samples. Labour force participation is higher in the Asia sample than in the two other samples, and unemployment is lower, regardless of whether the strict or the relaxed definition is applied. In terms of transition patterns, the share of successful transitions also outranks those of the two other samples, suggesting the presence of more dynamic and better functioning labour markets in the three Asian countries in the sample.

Table 4.3 Summary statistics, Asia (all household members)

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
9	7 388	21.314	4.273	15	29
Male	7 388	0.475	0.499	0	1
Married	7 388	0.301	0.459	0	1
Children	7 388	0.242	0.429	0	1
Respondents	7 388	1.808	0.852	1	7
Ever in school	7 388	0.961	0.193	0	1
Currently in school	7 388	0.432	0.495	0	1
Elementary education*	3 909	0.941	0.235	0	1
Secondary education*	3 909	0.439	0.496	0	1
Tertiary education*	3 909	0.112	0.315	0	1
In the labour force	7 388	0.624	0.484	0	1
In the labour force (relaxed)	7 388	0.654	0.476	0	1
Employed	4 608	0.924	0.265	0	1
Unemployed	4 608	0.076	0.265	0	1
Unemployed (relaxed)	4 835	0.119	0.324	0	1
Discouraged	576	0.234	0.424	0	1
Transited	7 361	0.485	0.5	0	1
In transition	7 361	0.217	0.412	0	1
Transition not started	7 361	0.298	0.457	0	1

Note: * Completed educational level, for those who have left school.
Source: Author's calculations based on ILO SWTS data.

The varying nature of the labour markets in the three regions is confirmed when looking at transition statistics (table 4.4). Youth in EECA and Asian countries have a greater number of activities in their labour market trajectories, though these are of shorter duration (activities in EECA countries being shorter than those in Asian countries). Furthermore, EECA youth are much more prone to encounter unemployment and inactivity in the course of their transition than either SSA or youth in Asia. The particular nature of the SSA labour market is also illustrated by the much lower probability of wage employment in the transition. Finally, in Asian countries, the proportion of individuals who worked at any time during their schooling is significantly higher than in either the SSA or EECA sample, and the share of satisfactory employment is also higher than in both regions.

Table 4.4 Transition statistics, by region

	SSA	EECA	Asia
Number of activities	1.5	1.7***	1.7***
Average activity length (months)	62.8	40.6***	46.5***
% with at least one unemployment spell	8.6	33.4***	6.4***
% with at least one inactivity spell	38.3	55.5***	53.0***
% with at least one wage employment spell	18.0	53.1***	55.2***
Share of satisfactory employment, %[7]	33.1	30.3***	38.2***
Worked during schooling, %	17.1	18.4*	30.8***

Note: * p<0.10, ** p<0.05, *** p<0.01.
Asterisks denote significant differences from SSA country means.
Source: Author's calculations based on ILO SWTS data.

4.4 Sibships[8]

Tables 6, 7 and 8 detail the labour market experiences of siblings relative to an individual's labour market status. These results suggest that family effects operate at several levels. First, in all regions, inactive individuals in school have more siblings who are also currently enrolled. In the SSA case, these results should be relativized since individuals who are inactive in school have, on average, more siblings in the 15–29-year-old group than individuals with other labour market statuses. In the EECA countries, employed individuals have more non-sibling young household members than other categories, suggesting that employment may be a condition for marriage and that the spouse is living with the family.

Regarding spells in and out of unemployment, self-employment and inactivity, the results are also indicative of common sibship trajectories. Siblings of unemployed individuals in the EECA group have, on average, a greater number of, and longer, unemployment spells than siblings of employed youth. Inactive individuals not in school also have siblings with more and longer inactivity spells in their trajectories, while employed individuals have siblings with more and longer self-employment spells. The length and number of sibling wage employment spells is not, however, clearly linked to individual employment. In fact, the results indicate that inactive individuals have siblings with more and longer wage employment spells. This might be due to a relaxation of the labour market participation constraint for non-employed siblings. It might also reflect a wealth effect, by which individuals in relatively rich families are those who can afford to remain inactive, while also being those with the highest probability of obtaining a good job.

In the SSA and Asia samples, employed individuals also have siblings with fewer and shorter unemployment spells. However, the concept of unemployment in developing countries is problematic, since functioning labour markets are not always found, especially in the rural context. This is, perhaps, particularly true in the African context, where it is not always possible to find a job in a rural area and resource constraints preclude any unproductive activities, such as spending time searching for employment. It is therefore unsurprising to see that unemployment spells are rare in the SSA samples. Finally, in the Asia and SSA countries unemployment relative to employment seems to be a predictor of sibling inactivity.

[7] Where data are available.

[8] In genetics, *sibship* refers to the group of children having the same parents.

Table 4.5 Sibling statistics, by individual's labour market status (SSA)

	Employed	Unemployed	Relaxed unemployed	NLFEET[9]	Inactive students
Age of siblings*	19.1	20.2	19.7	19.5	18.8
Number of siblings	1.02	1.09	0.88	1.18	1.35
Non-sibling respondents	0.24	0.34	0.22	0.25	0.29
Enrolled siblings	0.53	0.63	0.54	0.57	1.08
Out of school siblings	0.49	0.47	0.34	0.61	0.27
Unemployment spells	0.11	0.10	0.13	0.23	0.15
Inactivity spells	0.23	0.32	0.28	0.23	0.18
Self-employment spells	0.62	0.46	0.42	0.56	0.53
Wage employment spells	0.15	0.20	0.14	0.12	0.13
Length of unemployment	1.9	1.8	2.2	5.9	3.3
Length of inactivity	8.1	9.2	11.3	7.9	5.3
Length of self-employment	37.3	18.2	19.8	33.0	38.8
Length of wage employment	3.4	5.7	3.9	3.5	4.9

Note: * For individuals with at least one sibling between the ages of 15 and 29.
Number of spells and spell lengths are computed using data on those siblings who have left school.
Source: Author's calculations based on ILO SWTS data.

Table 4.6 Sibling statistics, by individual's labour market status (EECA

	Employed	Unemployed	Relaxed unemployed	NFLEET	Inactive in school
Age of siblings*	21.2	21.8	20.1	20.7	19.8
Number of siblings	0.58	0.63	0.62	0.62	0.59
Non-sibling respondents	0.23	0.13	0.12	0.16	0.04
Enrolled siblings	0.26	0.27	0.38	0.27	0.40
Out of school siblings	0.32	0.36	0.24	0.35	0.20
Unemployment spells	0.30	0.82	0.41	0.44	0.40
Inactivity spells	0.34	0.24	0.35	0.62	0.37
Self-employment spells	0.32	0.09	0.09	0.13	0.15
Wage employment spells	0.57	0.52	0.48	0.65	0.48
Length of unemployment	7.3	31.4	9.2	12.6	11.0
Length of inactivity	6.9	7.4	7.4	17.0	6.8
Length of self-employment	16.7	2.8	3.3	5.7	5.4
Length of wage employment	17.5	13.9	14.9	19.7	11.0

Note: * For individuals with at least one sibling between the ages of 15 and 29.
Number of spells and spell lengths are computed using data on those siblings who have left school.
Source: Author's calculations based on ILO SWTS data.

[9] Neither in the labour force, nor in education or training.

Table 4.7 Sibling statistics, by individual's labour market status (Asia)

	Employed	Unemployed	Relaxed unemployed	NFLEET	Inactive in school
Age of siblings*	20.8	20.4	20.0	20.8	19.9
Number of siblings	0.75	0.67	0.54	0.77	0.67
Non-sibling respondents	0.15	0.11	0.06	0.11	0.05
Enrolled siblings	0.27	0.41	0.28	0.25	0.46
Out of school siblings	0.48	0.27	0.26	0.53	0.21
Unemployment spells	0.05	0.16	0.14	0.05	0.06
Inactivity spells	0.43	0.53	0.69	0.71	0.51
Self-employment spells	0.48	0.23	0.33	0.51	0.28
Wage employment spells	0.61	0.48	0.32	0.47	0.47
Length of unemployment	0.7	2.5	2.4	0.9	0.9
Length of inactivity	9.5	12.4	19.3	20.5	7.8
Length of self-employment	24.4	11.8	14.7	35.3	12.5
Length of wage employment	20.9	18.8	12.3	18.8	14.9

Note: * For individuals with at least one sibling between the ages of 15 and 29.
Number of spells and spell lengths are computed using data on those siblings who have left school.
Source: Author's calculations based on ILO SWTS data.

5. Sibling-related determinants of current labour market status

A successful school-to-work transition requires individuals to have found a job at some point after leaving school. In a binary static approach, we look at the probability of having transited in the three regions. To keep the analysis simple, we refer to the state of being in employment as a completed transition. Since the data collected related only to 15–29-year-olds, with little or no information being collected on the remaining household or extended-household family members, we cannot exclude omitted variable bias.

To ensure accurate identification of variable bias would require the assumption that the labour market experience of in-sample siblings is unrelated to the composition and experience of out-of-sample siblings. This would surely be too sweeping an assumption. However, when household controls are introduced, any out-of-sample sibling information will be captured by the household-level fixed effects. In this regard, consideration of sibling correlations through variance decomposition serves as a tool to estimate the size of effects related to any common endowments acquired within the family, but generally fail to distinguish these from direct sibling effects. Although the effects are difficult to disentangle, we attempt later in this report to distinguish family effects from direct sibling effects by exploiting the unique position of each sibling in the family in terms of average labour market success of their siblings.

Tables 5.1 and 5.2 present logistic regression estimates of the probability of being employed. There is a significant loss of observations associated with these regressions since, first, only those individuals who have been to school and subsequently left are considered (in table 5.1 the sample is further restricted to only those individuals who declare themselves to be the son or daughter of the head of the household). Second, the use of a conditional logit model, although useful in correcting for unobserved heterogeneity at the household level, implies that any single-individual households will be dropped from the regression, as will those households with no variation in the outcome variable.

The implication of dropping all households that lack within-family variation when studying sibling correlations constitutes an exclusion bias – all the more pronounced as we are primarily interested in sibling correlates and yet these constitute an exclusion criterion. Excluding those households where all siblings either work or do not work implies that we will, by default, find a negative correlation between sibling outcomes. Nevertheless, in a first exploratory regression excluding sibling labour market experience we present conditional logit estimates alongside the logit estimates.

Table 5.1 Odds ratios from logistic regressions on the probability of being employed, sons/daughters only

	Logit				Conditional logit			
	All regions	**SSA**	**EECA**	**Asia**	**All regions**	**SSA**	**EECA**	**Asia**
Age	1.115	1.061***	1.146***	1.100***	1.148**	1.177	1.219*	1.120
Male	1.311***	1.213	1.476***	1.055	1.624***	1.048	1.786**	2.305**
Household size	0.961**	0.974	0.917**	0.992				
Elementary education	0.806	0.808	1.992	0.753	0.726	1.057	1.27E+06	0.188
Secondary education	0.733***	0.695**	0.732***	0.889	0.583*	0.370*	0.720	0.772
Tertiary education	1.315***	1.165	1.494***	0.737	1.248	6.420	1.683	0.592
Out of school siblings	1.040	1.014	1.126	0.999				
Non-sibling respondents	1.182**	0.993	1.306**	1.446**				
Older siblings	0.796***	0.715*	0.826	0.771	0.874	0.755*	1.333	0.699
Older siblings same sex	1.308**	1.428	1.175	1.470*	1.165	1.992**	0.447**	1.483
Country dummies	Yes	Yes	Yes	Yes				
Constant	0.0679***	0.220***	0.0353***	1.079				
Pseudo R^2	0.141	0.0883	0.0969	0.0554	0.099	0.1381	0.1658	0.1552
Observations	7 070	1 121	3 464	2 485	664	200	287	177

*** p<0.01, ** p<0.05, * p <0.1.
Standard errors are clustered at the household level in the logit model.
Regressions contain individuals who have left school (thus excluding those who never went to school) and who are sons or daughters of the head of household.
Source: Author's calculations based on ILO SWTS data.

Unsurprisingly, the regressions indicate that age is positively correlated with employment. As individuals grow older, their probability of participating in the labour market, and thus searching for and finding a job, increases. This result holds in the conditional logit model, although it is only significant when all regions are considered together. Being male increases the probability of finding employment in Asia and EECA countries, though not in the SSA sample. The positive effect probably reflects labour force participation rate differentials between men and women in EECA and Asia.

Analysing labour force participation rates of men and women in the three regions reveals that the region where the difference between male and female participation rate is lowest is SSA. In terms of education, having a secondary education implies a lower probability of employment in SSA and EECA countries. This finding does not come as much of a surprise in the EECA sample context, where schooling is almost universal and very few observations thus represent the base category. Furthermore, the proportion of the population with at least secondary level education is over 75 per cent, with 25 per cent holding a tertiary level degree. In this context, secondary level education actually

constitutes a relatively low level of education. In SSA, however, the result may be driven by a household wealth effect. Those households which can afford to send their children to secondary school are also those which can afford to keep children out of employment. Furthermore, it is likely that a threshold effect exists in terms of education where, above a certain level of education, individuals start to look for high-quality jobs and are no longer prepared to accept self-employment or options which they perceive to be second best.

The family composition and birth order variables are not straightforward to interpret. Household size seems to play a role in the EECA and SSA countries (table 5.2), with youth from larger households being less likely to be employed (coefficients, however, remain negative but not significant in Asia). The presence of non-sibling respondents in the household increases the probability of employment in the Asia and EECA samples. This might reflect the presence of spouses living with their parents and/or having children to support.

Table 5.2 Odds ratios from logistic regressions on the probability of being employed, all household members

	Logit				Conditional logit			
	All regions	**SSA**	**EECA**	**Asia**	**All regions**	**SSA**	**EECA**	**Asia**
Age	1.080***	1.090***	1.086***	1.057***	1.157***	1.171***	1.194***	1.049
Male	1.719***	1.846***	1.951***	1.125	3.101***	3.615***	3.054***	3.187***
Household size	0.948***	0.968**	0.890***	0.974				
Elementary education	0.967	0.976	2.438**	0.790	1.096	1.229	3.901	0.432
Secondary education	0.840***	0.751***	0.877	1.066	0.823	0.741	0.879	1.104
Tertiary education	1.533***	1.138	1.709***	0.932	1.215	1.466	1.340	0.696
Out of school respondents	1.255***	1.174**	1.394***	1.165				
Respondents who are sons/daughters	0.968	0.896**	0.990	1.103				
Older respondents	0.698***	0.859*	0.556***	0.739**	0.634***	0.855	0.548***	0.546**
Older same sex respondents	1.286***	1.016	1.711***	1.251	1.870***	1.564***	2.049***	1.684**
Country dummies	Yes	Yes	Yes	Yes				
Constant	0.140***	0.107***	0.0566***	1.969				
Pseudo R^2	0.1203	0.0853	0.0909	0.0499	0.2768	0.276	0.3139	0.2252
Observations	14 632	4 598	6 126	3 908	2 634	1 045	1 215	374

*** p <0.01, ** p <0.05, * p <0.1.
Standard errors are clustered at the household level in the logit model.
Regressions contain individuals who have left school (thus excluding those who never went to school), regardless of their relationship to the head of household.
Source: Author's calculations based on ILO SWTS data.

Interestingly, the number of older siblings is negatively correlated with employment across the board, while the number of older respondents of the same sex is positively correlated with employment. It is plausible that there are lower expectations that relatively junior members of the family should provide for the household, and therefore they are less likely to search for employment. Another possible explanation is that the junior family members might be retained for household duties while their elders, who have been allotted a higher level of investment in education, might be designated for wage labour. This birth order effect of investment in education has been discussed by Blake (1981). At the same time, this result would be coherent with the mechanism discussed by Emerson and Souza (2008), in the context of labour markets which utilize child labour. Finally, the circulation of information on labour opportunities is likely to be gender biased, if young men and women face different sets of potential outcomes in the

labour market. The conditional logit model for EECA, however, yields the inverse results. Here, older siblings positively influence employment probabilities, while older same sex siblings negatively influence it. However, the effect reverts to that of other regions when all household members are taken into consideration.

Table 5.3 incorporates elements of the transition into the previous regression. Looking at individual past experiences in the labour market, a conflicting pattern of past dependence is discernible. Past unemployment experiences increase the probability of being in employment, while wage employment or inactivity in the past decreases that probability. In the case of unemployment, having been unemployed excludes individuals from belonging to the category of people who transited directly into inactivity and never looked for a job. The same pattern occurs across regions and in both samples.

Table 5.3 Odds ratios from a logit regression on employment

	Siblings only				All household members			
	All regions	**SSA**	**EECA**	**Asia**	**All regions**	**SSA**	**EECA**	**Asia**
Age	1.098***	1.048**	1.136***	1.080***	1.068***	1.079***	1.075***	1.036***
Male	1.352***	1.228	1.594***	1.059	1.767***	1.884***	2.019***	1.169*
Household size	0.966*	0.973	0.931*	0.999	0.952***	0.965***	0.891***	0.993
Elementary education	0.759	0.740	1.955	0.775	0.868	0.887	2.056*	0.835
Secondary education	0.751***	0.731**	0.720***	0.935	0.860***	0.779***	0.845*	1.122
Tertiary education	1.379***	1.290	1.563***	0.800	1.621***	1.244	1.817***	1.037
Out of school siblings	1.305***	1.157	1.867***	0.997	1.341***	1.203***	1.603***	1.111
Non-sibling respondents	1.170**	1.025	1.204*	1.386*				
Older siblings	0.806**	0.706*	0.870	0.818	0.709***	0.854**	0.571***	0.741**
Older same sex siblings	1.297**	1.480*	1.126	1.356	1.279***	1.012	1.713***	1.288
Total number of activities	1.758***	1.706***	1.652***	1.961***	1.681***	1.527***	1.740***	1.973***
Past unemployment spells	1.721***	1.364	1.998***	1.040	1.646***	0.822	1.814***	1.788*
Past wage employment spells	0.423***	0.511***	0.415***	0.448***	0.482***	0.637***	0.428***	0.425***
Past inactivity spells	0.792*	0.578**	0.788	1.208	0.807***	0.821*	0.782**	0.827
Siblings' unemployment spells	0.549***	0.682	0.450***	0.834	0.627***	0.797	0.574***	0.497*
Siblings' inactivity spells	0.690***	0.727	0.569***	0.816	1.054	0.989	1.056	1.137
Siblings' wage employment spells	1.344**	1.572*	1.374*	1.333	1.211***	1.475***	1.146	1.451**
Siblings' length of unemployment	0.992***	1.009	0.991***	0.980	0.996**	1.004	0.994**	0.992
Sibling's length of inactivity	0.997	0.996	0.996	0.996	0.998**	0.998	0.998	0.996*
Sibling length of wage employment	0.998	0.992	0.997	0.998	0.996***	0.992***	0.996**	0.998
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0419***	0.143***	0.0192***	0.449	0.0950***	0.0774***	0.0390***	0.715
Pseudo R^2	0.181	0.1088	0.1603	0.0833				
Observations	7 070	1 121	3 464	2 485	14 632	4 598	6 126	3 908

*** p <0.01, ** p <0.05, * p <0.1.
Standard errors are clustered at the household level.
Source: Author's calculations based on ILO SWTS data.

When siblings are taken into account, however, the correlations are positive. The sibling-related variables are average per-sibling spells and lengths (months spent in each state). Having siblings who have held, on average, a greater number of wage employment spells increases the probability of being employed. Siblings with relatively numerous

unemployment and inactivity spells in their past, however, correlate negatively with individual employment. As previously stated, conditioning on households means that all households without variation in the employment status across respondents are excluded, and the selection bias will ensure a negative correlation between sibling employment and individual employment. We therefore use a linear probability model (see table A.6 in Annex I) with household fixed effects alongside the probit model. Linear probability models are associated with other errors, such as heteroskedasticity and nonsensical predictions, but do nevertheless constitute the most reasonable alternative to a conditional logit model. The results regarding past labour market experiences are confirmed, while past sibling experiences are now negatively correlated with the probability of employment.

This suggests that the initial positive correlations between siblings' labour market status reflect common genetic and environmental endowments that influence success in the labour market: within a given family, individuals would either be competing for employment or be allotted to different positions in the labour market by the head of the household. It is, however, likely that wage employment and self-employment are not valued to the same degree by individuals, and one might reasonably be considered to constitute an indicator of success, while the other reflects a mere necessity to provide income for the household. A multinomial logit is therefore run on the previous samples, the outcome variable being split into four categories: wage employment, other employment, unemployment and NLFEET, the base outcome.

In Annex tables A.1 and A.2, household poverty (as reported by the respondent) is negatively correlated with labour market participation in EECA countries. This might seem curious, since one would expect poverty to force youth into the labour market. Inverted causality is, however, likely to have an effect here, with respondents reporting themselves to be relatively poor precisely because they are excluded from the labour market, thereby experiencing a lower (or zero) income (as well as lower self-esteem). In SSA, the coefficients are of the same sign but rarely significant, which might reflect double causality. Poorer households need to resort to the labour market in order to survive; yet, those individuals who face inactivity (the discouraged, whose numbers are significant in the SSA sample) are likely to declare themselves poor for the very same reason. In Asia, however, subjectively poorer individuals have a greater chance of being employed, suggesting that resource constraints are the main operating channel here.

Looking at individual labour market experience, it is clear that negative past labour market experiences are correlated with positive present experiences. As such, past spells of unemployment increase the probability of being a wage earner rather than being inactive at the survey date. The coefficients are significant across all specifications. There also seems to be a positive correlation with self-employment and unemployment. It could be argued that this reflects past dependence in inactivity. Those who were unemployed were in the labour market in the past, and they are likely to have stayed there, eventually finding employment. However, past inactivity spells also correlate with labour market participation, at least in the Asia and EECA countries.

Turning to sibling-related variables, the number of respondents, i.e. the number of youth cohabiting in the household who were eligible and answered the survey, does not exert a clear influence on transitions into activity in the labour market. This factor is uncorrelated with labour market participation in the small sample, but positively correlated in the large Asia and EECA samples. The number of older respondents seems to be negatively correlated with wage employment across the board but, in contrast, the number of older respondents of the same sex is positively correlated with wage employment (although the results are sometimes not significant they are of the correct sign in the regional samples), as in the previous regressions. Contamination from a

correlation with age might be suspected, but the correlation coefficient for the number of older respondents and age is rather unimpressive, less than 0.3 in all three samples. Again, it is plausible that there are lower expectations that relatively junior members of the family should provide for the household, making them therefore less likely to search for wage employment. Another possible channel of transmission is information: household members who are successful in the labour market might hold the key to positive labour market outcomes, either by having knowledge of employment strategies that might be shared with other members, or through their social networks, which might provide opportunities for siblings. As previously stated, there is likely to be a gender bias, with information available from young men being of little value to women, and vice versa.

Looking at concrete labour market experiences, such as the length and number of spells of unemployment, self-employment and inactivity for siblings, some interesting results emerge. The number of sibling unemployment and inactivity spells seems to decrease the probability of employment in EECA countries, but not significantly in the two other regions. Again, a number of channels of transmission can be envisaged; potentially, a social network effect (or rather lack thereof) would explain this correlation: if your siblings are unaware of good employment opportunities and choose inactivity, it is likely that you will do the same. Finally, sibling spells in wage employment seem to positively influence the probability of employment (although only in Asian countries when the smaller sample is used). In the SSA sample, sibling wage employment is associated with an increased probability of self-employment. This model therefore tends to concur with the results from the previous logit model; namely, that sibling outcomes are positively correlated.

The multinomial logit approach suffers from a number of drawbacks. Setting the identification problems aside for the moment, this approach does not maximize our knowledge of the timing of events. Running a logit on the present state means we are not directly modelling transitions, but rather an outcome variable at the survey date. Furthermore, this approach does not account for unobserved heterogeneity at the household level, thus potentially confounding the correlates that are specifically sought with unobserved ones. When a linear probability model is used, sibling-related covariates correlate differently with the outcome variable, suggesting that a more detailed examination of the mechanisms at play should be considered. From the labour market history module of the SWTS, we can access information regarding labour market histories, enabling us to retrace the "careers" of respondents, to allow a survival analysis to be undertaken.

6. Surviving in the labour market

By setting up the data as panel data, we were able provide an alternative to the previous regression and take into account the pseudo-temporal dimension of the data. The main drawback of panel data methods for event history data, however, is that they do not take into account the time during which the individual is at risk. Survival (time-to-event) analysis methods are therefore likely to be better suited to study event history data, a theory which is supported by the growing use of such techniques in social sciences over the past decades. Individuals in our data set move between different states in the labour market, conditionally on covariates that can either reflect time-independent or time-varying characteristics. Our data is, therefore, of the multiple-spell/multiple-failure (or multistate) type, meaning that the most standard survival analysis techniques do not apply or apply with strong assumptions. We therefore begin with a binary model, looking at the transition into employment in a survival framework.

6.1 A binary model of labour market participation

We choose to label as *Failure*, in the survival analysis sense, individual transitions into employment. We further assume that the process of individuals entering the labour market is a continuous one. The choice of a continuous-time specification relies on the fact that our time intervals are months, and that the duration of an average spell is relatively important, thus precluding substantial grouping (Jenkins, 2005). Survival analysis in general relies on the estimation of hazard rates - the rate, at time *t*, at which individuals fail conditional on their survival up until *t*. In a proportional hazards model, a baseline hazard function is assumed: $\lambda_0(t)$, with covariates affecting the baseline hazard multiplicatively in the following way:

$$\lambda_i\big(t, X_i(t)\big) = \lambda_0(t)\exp\{X_i(t)'\beta\} \qquad (1)$$

Labour market transitions, by their nature, imply that multiple failures can occur within a subject. However, standard survival analysis techniques require independence across failure times. Pooling individual observations in a *repeated spells* framework thus requires that no unobserved heterogeneity violates the independence assumption. To overcome this, clustered standard errors have been used in the literature, although this is not ideal, since heterogeneity remains unmodelled.[10] Our subject of interest being the school-to-work transition, excluding multiple spells – and thus losing potentially relevant information – seems to be a reasonable compromise. Including transitions occurring after the first employment opportunity would have implied shifting the focus from the direct schooling–labour market path to transitions from inactivity into the labour market in general. Furthermore, the number of multiple *within-subject* non-employment to employment transitions is low, and results are likely to be unaffected by their inclusion. The choice of a distribution for the baseline hazard relies on assumptions about the evolution of the hazard rate over time. Non-parametric estimation can provide guidelines on the shape of the integrated hazard function, and thus the underlying survivor and hazard functions. We fit the well-known Kaplan–Meier estimator of the survivor function to our data as well as a smoothed hazard function (the results are given in figure 6.1).

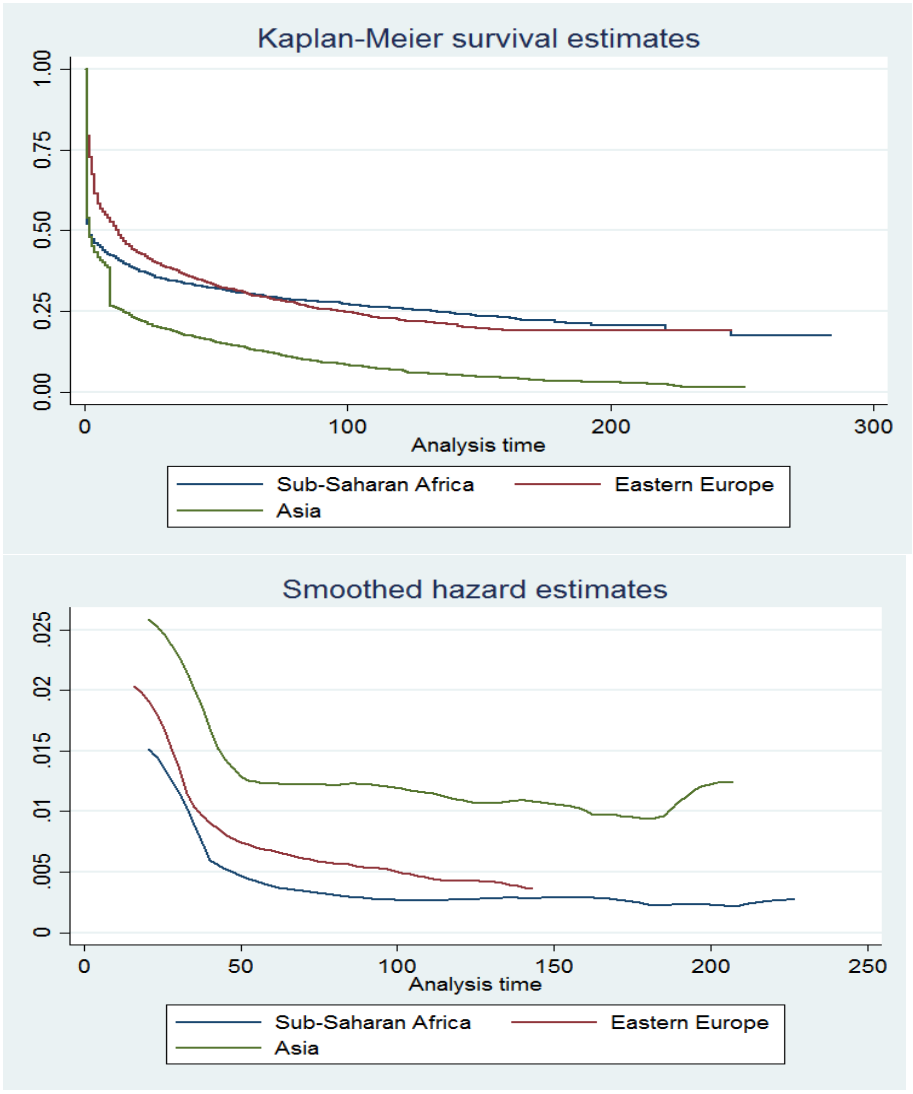
Defining the transition to model requires the origin time of observations to be defined: in this case, at what time do we consider that an individual begins to experience risk, i.e. the possibility of transiting into activity? Empirically, an individual can transit directly into activity from school, but we might not necessarily want to consider an individual as being at risk while in school, since most individuals are not looking for work during their schooling. Our target individuals could also be defined as the complement of employed individuals, i.e. all those who are not employed, regardless of whether that status is due to enrolment in school, inactivity or unemployment. In that case, we jointly model at least two different phenomena, school failure and labour market failure.

Finally, we might choose to consider as being at risk those individuals who have permanently left school, focusing primarily on the first transition into employment. Beyond defining an object of study, the question is important for two reasons: first, the sample sizes vary greatly according to the three definitions; second, the share of failures varies widely, possibly affecting model choice and precision. We shall focus on the transition from non-employment to employment of individuals who have left school, meaning that our individuals become at risk once they leave school, whether this is due to

[10] In our case, we intend to cluster errors at the household level, thus precluding individual clustering.

school failure or on graduation. However, this implies that individuals who transit directly from school into employment will be excluded from the sample. An alternative to this method would be to add a fictitious month to all transition times, thus including all those who transited directly. We feel that this method is an adequate way of avoiding the otherwise problematic selection issue. As a robustness check, regressions that exclude direct transitions are provided in Annex I.

Figure 6.1 Kaplan–Meier estimates and smoothed hazard functions (months)



Source: Author's calculations based on ILO SWTS data.

The Kaplan–Meier survival estimate appears similar in all three regions, with a strong drop at the beginning (implying that many school leavers rapidly (immediately) transit into employment), followed by a flattening out of the curve. The lower position of the Asia curve implies that very few individuals in this sample do not experience any transition. In all three samples, the hazard is initially decreasing, suggesting negative time dependence in the initial stages of the transition. The curves then flatten out, with something akin to a constant hazard prevailing over a long period. The Asia hazard is, however, consistently higher than both the SSA and EECA hazards, suggesting that individuals in these countries are more prone to transit into employment at any stage of the transition.

The Kaplan–Meier estimates and smoothed hazard functions suggest that a Weibull or Gompertz distribution may be good choices for the data at hand. However, Cox regression might also be a valid alternative, since it does not require an underlying survival distribution, relying instead on partial likelihood for estimation of hazard ratios. However, implementation of frailty is computationally more demanding in this analysis, and not much can be said about path dependence. We therefore use two alternative specifications: a Cox regression where standard errors are clustered at the household level and a parametric specification with shared frailty across households. The results are presented in tables 6.1 and 6.2.[11] Hanushek (1992) and Booth and Kee (2009) point out that there is an inherent relationship between birth order and family size, since a child born earlier has a higher probability of being in a small family and one born later has a higher probability of being in a large family. A birth order variable is thus correlated with family size and identification of an accurate birth order effect is questionable. Booth and Kee's suggested remedy is to weight each birth order by the average birth order in the family. We apply this method both to the overall birth order and the sex-specific birth order, purging birth order variables from the effects of family size.

Since we are essentially analysing sibling correlations, it could be argued that any correlation found would represent nothing more than family fixed effects, with sibling labour market outcomes being proxies for some unobserved heterogeneity. To try to address this issue, shared frailty was introduced into the parametric regressions. While shared frailty at the household level is not equivalent to household fixed effects,[12] it does imply that reported hazard ratios are to be interpreted as conditional on frailty. The hazard function therefore becomes:

$$\lambda_{i(j)}(t, X_i(t), \theta) = \theta_j \lambda_0(t) \exp\{X_i(t)'\beta\} \qquad (2)$$

with θ a random effect unrelated to covariates. This model can fit as long as a distribution is given to the baseline hazard λ_0 and the random effect θ (Gutierrez, 2002). We use a gamma distribution for θ in the above regressions, since heterogeneity distributions have been shown to converge to a gamma distribution for a large number of models (Abbring and Van Den Berg, 2007), but trials with an inverse Gaussian (the other commonly assumed distribution) give qualitatively equivalent results.

The proportional hazards assumption is a rather overextended one, implying constant coefficients of the regressors over time. This assumption can be tested in a variety of ways. First, including interactions of suspicious regressors with time can shed light on the proportionality assumption. Coefficients should be stable over time, and interactions should thus not appear as significant. Interactions of time and the two birth order indices, as well as siblings' length of time in various states of the labour market, were added to the model. The interactions of all three sibling length variables and time show up in the analysis as significant, indicating that the proportional hazards assumption does not hold for these variables. In that case, the hazard ratios become difficult to interpret. Verification using the test developed by Therneau and Grambsch (2000) further confirms this finding. An alternative to the proportional hazards (PH) model is to run an accelerated failure time model, which relaxes the PH assumption. Another way of dealing with this issue is to use time-varying covariates, as demonstrated in the following section.

[11] Results on the samples restricted to sons/daughters are presented in Annex.

[12] It is rather the duration model equivalent of a random effects model.

Table 6.1 Hazard ratios obtained from Cox regression, all household members, including direct transitions

	All regions		SSA		EECA		Asia	
Age	1.003	(0.00331)	0.996	(0.00608)	1.026***	(0.00616)	0.986***	(0.00514)
Male	1.228***	(0.0237)	1.320***	(0.0518)	1.442***	(0.0461)	1.021	(0.0309)
Household size	0.971***	(0.00559)	0.991	(0.00738)	0.950***	(0.0123)	0.982**	(0.00907)
Elementary education	1.374***	(0.0804)					1.432***	(0.102)
Secondary education	0.963	(0.0229)	0.855***	(0.0343)	0.956	(0.0461)	1.104***	(0.0411)
Tertiary education	1.262***	(0.0374)	0.973	(0.0882)	1.375***	(0.0600)	1.174***	(0.0539)
Marital status:								
engaged	0.983	(0.0580)	1.046	(0.0722)	0.883	(0.0764)	1.349***	(0.128)
married	0.932**	(0.0297)	0.957	(0.0583)	0.789***	(0.0422)	1.050	(0.0552)
divorced	0.966	(0.0582)	0.982	(0.109)	0.913	(0.0731)	0.823	(0.191)
widow	0.999	(0.146)	0.967	(0.288)	1.011	(0.309)	1.112	(0.228)
Children	0.902***	(0.0284)	1.058	(0.0581)	0.830***	(0.0434)	0.919	(0.0524)
Subjective household wealth assessment:								
fairly well off	0.897**	(0.0488)	0.858	(0.124)	0.876**	(0.0572)	1.179	(0.348)
around national average	0.859***	(0.0427)	0.852	(0.116)	0.842***	(0.0481)	1.199	(0.349)
fairly poor	0.835***	(0.0438)	0.797*	(0.110)	0.808***	(0.0515)	1.213	(0.355)
poor	0.763***	(0.0460)	0.778*	(0.109)	0.621***	(0.0534)	1.262	(0.377)
Respondents	0.962**	(0.0164)	0.851***	(0.0216)	1.030	(0.0303)	1.053**	(0.0251)
Birth index	0.684***	(0.0326)	0.578***	(0.0598)	0.625***	(0.0498)	0.896	(0.0634)
Birth index same sex	1.244***	(0.0840)	1.185	(0.149)	1.570***	(0.179)	0.983	(0.101)
Ratio of transited respondents.	1.111***	(0.0317)	1.060	(0.0579)	1.146***	(0.0597)	1.063	(0.0449)
Respondents' length of unemployment	0.994***	(0.00105)	1.001	(0.00213)	0.993***	(0.00121)	0.990**	(0.00376)
Respondents' length of inactivity	0.997***	(0.000546)	0.998*	(0.00135)	1.000	(0.000860)	0.993***	(0.000911)
Respondents' length of wage employment	1.001*	(0.000413)	1.001	(0.00147)	1.001	(0.000780)	1.000	(0.000558)
Observations	16 880		3 433		8 838		4 609	
Subjects	12 160		2 730		5 644		3 786	
Failures	9 271		1 976		3 874		3 421	
Clusters	9 352		2 190		4 392		2 770	

Note: Standard errors clustered on household identifiers.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table 6.2 Hazard ratios obtained from Gompertz regression with frailty, all household members, including direct transitions

	All regions		SSA		EECA		Asia	
Age	1.007	(0.00586)	0.994	(0.0123)	1.035***	(0.0106)	0.982**	(0.00824)
Male	1.396***	(0.0429)	1.654***	(0.124)	1.790***	(0.0881)	1.009	(0.0459)
Household size	0.966***	(0.00951)	0.999	(0.0148)	0.941***	(0.0207)	0.985	(0.0152)
Elementary education	1.536***	(0.180)					1.766***	(0.194)
Secondary education	0.937	(0.0379)	0.831**	(0.0655)	0.963	(0.0771)	1.170***	(0.0655)
Tertiary education	1.476***	(0.0792)	0.936	(0.166)	1.738***	(0.130)	1.221**	(0.106)
Marital status:								
engaged	0.920	(0.0890)	0.981	(0.132)	0.781	(0.135)	1.314	(0.342)
married	0.864***	(0.0490)	0.957	(0.115)	0.668***	(0.0633)	1.085	(0.0928)
divorced	0.864	(0.0936)	0.973	(0.243)	0.792	(0.118)	0.972	(0.234)
widow	0.744	(0.222)	0.334	(0.225)	0.619	(0.354)	1.227	(0.448)
Children	0.852***	(0.0479)	1.061	(0.115)	0.778***	(0.0733)	0.865	(0.0776)
Subjective household wealth assesment:								
fairly well off	0.802**	(0.0795)	0.834	(0.245)	0.846	(0.101)	1.232	(0.536)
around national average	0.717***	(0.0655)	0.824	(0.227)	0.701***	(0.0755)	1.261	(0.537)
fairly poor	0.696***	(0.0667)	0.721	(0.201)	0.655***	(0.0781)	1.332	(0.570)
poor	0.630***	(0.0670)	0.710	(0.202)	0.489***	(0.0720)	1.502	(0.661)

	All regions		SSA		EECA		Asia	
Respondents	0.931**	(0.0262)	0.754***	(0.0366)	1.009	(0.0523)	1.073	(0.0480)
Birth index	0.713***	(0.0473)	0.455***	(0.0743)	0.672***	(0.0734)	0.960	(0.0931)
Birth index same sex	1.154	(0.108)	1.282	(0.253)	1.500**	(0.240)	0.851	(0.121)
Ratio of transited respondents.	0.860***	(0.0397)	0.731***	(0.0724)	0.836**	(0.0668)	0.938	(0.0642)
Respondents' length of unemployment	0.998	(0.00167)	1.007	(0.00426)	0.999	(0.00214)	0.986**	(0.00689)
Respondents' length of inactivity	1.009***	(0.000924)	1.007***	(0.00242)	1.014***	(0.00142)	0.999	(0.00138)
Respondents' length of wage employment	0.997***	(0.000708)	0.995*	(0.00258)	0.994***	(0.00121)	0.998*	(0.000895)
Constant	0.528***	(0.127)	1.322	(0.614)	0.0851***	(0.0300)	0.103***	(0.0529)
	16 880		3 433		8 838		4 609	
Observations	9 352		2 190		4 392		2 770	
Number of groups	12 160		2 730		5 644		3 786	
Subjects	9 271		1 976		3 874		3 421	
Failures	0.984***	(0.000839)	0.963***	(0.00226)	0.985***	(0.00129)	0.992***	(0.00125)
γ	1.167***	(0.0359)	1.228***	(0.0674)	1.479***	(0.0746)	0.673***	(0.0383)
Ln θ	1.007	(0.00586)	0.994	(0.0123)	1.035***	(0.0106)	0.982**	(0.00824)

*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

The results in tables 6.1 and 6.2 show that the age variable has contrasting effects on survival times in the Asia and EECA samples. An older person in the EECA sample is at any point in time (all other things being equal) more likely to experience failure by the next point in time. This result could conceivably be driven by a correlation between life situation and age. Older siblings are more likely to be designated as providers for the household, and are more likely to have started a family of their own (albeit while remaining with their parents). They have also had more time to go through the transition process into stable and satisfactory work. This mechanism is contradicted in the Asian countries where age decreases the hazard ratio of employment. This could reflect education failure, where those who have spent more time in education, due to having to repeat grades, are also those who will struggle in the labour market.

Being a male increases the chances of failure in SSA and in EECA, but not in Asia. The household size variable, which includes all members, regardless of their age, reduces the probability of transition in all regions, although the coefficient is not significant in the SSA sample. Education also shows disparate effects depending on the region. Tertiary education positively influences transition hazards in Asia and EECA, but not in SSA, where secondary education also negatively influences transitions. Thus, graduates with secondary level education are less likely than candidates with no education to experience a short transition in the SSA sample. This might reflect enrolment decisions at the household level. It might be precisely because the individual is needed to work on the family plot that he or she was taken out of school and thus has no diploma. The marital status and children coefficients appear negative. This very probably reflects the practice of women being designated for domestic duties once married or taking care of children when children are present. An added interaction of the male variable and the children variable confirms this, since the interaction is found significant and positive. Being a male with children thus increases the transition hazard (due to increased pressure to provide for the family).

Looking at the birth order indices, the number of older respondents reduces hazard in all three regions (although the effect is not significant for Asia in the frailty model). The number of older respondents of the same sex, however, increases transition hazard (although the effect is only significant for EECA in the frailty model). However, it would

be preferable to study birth order effects within the context of sons and daughters of heads of households, since non-sibling family members might be recent additions to the family, or in any case not fall within the family planner's initial resource allocation. Interestingly, once we limit the sample to sons and daughters of heads of households, the birth order indices cease to be significant, except in the EECA countries in the frailty model.

In this model, the coefficient for older siblings is larger than the one in the EECA sample, suggesting that having older siblings increases the hazard rate of transition. This does seem like a reasonable outcome, if younger siblings learn and improve on the experiences of their older counterparts. At least two separate effects are likely to be behind these coefficients. First, it is likely that older siblings are more frequently relied on for the provision of parental care, and may also be expected to assist in generating income, thereby relaxing to a certain degree the constraints on their younger siblings, who will have the opportunity to take more time over their transition. This would be a "pure" birth order effect. Second, a greater number of siblings implies more information-sharing possibilities, more contacts and the opportunity for younger siblings to learn from the experiences of their older brothers and sisters. Moreover, it is possible that the value of information transmitted between siblings is gender-specific, since labour market options may not be equal for young men and young women due to traditions and discriminatory practices, particularly in developing countries. However, we do not find consistent evidence of this proposition.

Regarding the variables related to sibling labour market success, the two regressions show opposite results. In the Cox regression, where unobserved heterogeneity is not accounted for, positive correlations prevail between sibling labour market experiences. Siblings' average length of time spent in inactivity and unemployment decreases the transition probabilities of their brothers and sisters, while time spent in wage employment increases it in relative terms. Similarly, the ratio of transited siblings to siblings in transition is positively related to the transition hazard. These results hold for both samples (all household members as well as just sons and daughters). When unobserved heterogeneity is accounted for, however, the results are somewhat inversed. Siblings' length of time in inactivity now positively influences the hazard ratio, and length of time in wage employment negatively influences it. The ratio of transited to in-transition siblings also contributes negatively to the hazard. The same reversal occurs when fixed effects are introduced into the linear probability model.

Two preliminary conclusions can be drawn from these results. Siblings' labour market experiences influence individuals' labour market outcomes, and the position in the sibling hierarchy, conditional on gender, plays a role in the probability of transiting into employment. Sibling correlations are positive, but these positive correlations (which are in line with the findings in the literature) are likely to reflect unobserved heterogeneity at the household level. When this is accounted for, by a linear probability model and by introducing shared frailty in a Gompertz regression, sibling correlations seem rather to be negative, lending support to the theory of sibling rivalry. This specification, however, reflects a framework in which transition times are modelled on a set of time invariant characteristics of the individuals, ruling out the possibility of utilizing our knowledge of the timing of events.

This is likely to bias results in a number of ways. First, not knowing whether sibling experiences occurred before, at the same time or after individual experiences means that we risk confounding direct influences of sibling trajectories with some unobserved latent variable accounting for labour market success and not captured by the unobserved household frailty. In effect, we might be explaining past transitions using present sibling labour market experiences. Second, this effect might be all the more dramatic if

dependence on time is negative; that is if past failures actually lay the groundwork for current success and vice versa. Indications of negative past dependence for wage employment were found in the multinomial regressions detailed above (section 5). The following subsection will therefore introduce time-varying covariates into the previously described models, while also relaxing the proportional hazards assumption for these covariates.

6.1.1 Time-varying covariates

Knowing the exact stage in transition or in the schooling process when a given sibling labour market experience occurs is crucial for good identification of the estimated parameters. In the foregoing analysis we have not taken into account the point in time at which an individual's siblings transited into and out of the labour market, i.e. we are using the event history dimension for our outcome variable only, allowing sibling experiences to be reflected by averages over their full transition path, regardless of the time at which the individual transition occurred. It it possible that the previous results were driven not by the influence of sibling outcomes at the time of transition, but by a correlation between an individual's transition and sibling labour market outcomes at a later date. Incorporating time-varying covariates allows us to control for changes in the composition of sibling labour market statuses at the time of transition. We therefore compute time-varying variables representing the number of siblings not in school, in unemployment, in inactivity and in wage employment, applying the same models as previously.

The results are given in tables 6.3 and 6.4. For sons and daughters of the heads of households, the impact of siblings' inactivity or unemployment (although this is now expressed as the number of siblings in inactivity or unemployment rather than total length of siblings' time in these statuses) remains negative, and in line with the correlations from the multinomial logit regressions. The coefficients are stable and significant in EECA and Asia in the Cox regression and the parametric frailty regression alike. In SSA, however, coefficients are not significant and rather point to a positive relationship between sibling inactivity or unemployment and individual employment transition. In EECA and Asia, the number of siblings who have left school and are therefore subject to joining the labour market, is positively related to employment transitions. This concurs with a social network or information-based explanation of transition times. As individuals leave school and enter the labour market, they encounter information which may be of value to their siblings. The greater the number of siblings in a state of transition, the more information is gathered collectively and (provided this information is shared) accessed individually. Again, the SSA sample is different, showing a negative correlation between transition hazard and the number of siblings who are out of school.

Simply transiting into employment might be seen as a crude measure of labour market success, with the possibility of refining the model depending on the type of job sought. In the following section, a competing risk framework is adopted, in which individuals leave their initial status for one of two competing statuses (wage employment and other employment), conditional on not having transited to the other.

Table 6.3 Hazard ratios obtained from Cox regressions, sons and daughters of heads of households, including direct transitions

	All regions		SSA		EECA		Asia	
Age	0.994	(0.00425)	0.992	(0.0101)	1.008	(0.00727)	0.989*	(0.00631)
Male	1.126***	(0.0300)	1.124*	(0.0720)	1.322***	(0.0580)	1.003	(0.0394)
Household size	1.005	(0.00798)	1.028***	(0.0102)	0.989	(0.0190)	0.993	(0.0103)
Elementary education	1.549***	(0.140)					1.654***	(0.174)
Secondary education	1.009	(0.0324)	0.865**	(0.0616)	1.011	(0.0604)	1.109**	(0.0510)
Tertiary education	1.263***	(0.0481)	0.934	(0.160)	1.382***	(0.0778)	1.107*	(0.0608)
Marital status:								
engaged	0.923	(0.0830)	0.939	(0.0975)	0.921	(0.117)	1.259**	(0.121)
married	1.006	(0.0497)	0.903	(0.119)	0.926	(0.0768)	0.988	(0.0780)
divorced	0.838**	(0.0717)	0.700*	(0.145)	0.838	(0.0941)	0.790	(0.181)
widow	1.035	(0.257)	2.937***	(0.875)	1.040	(0.526)	0.860	(0.275)
Children	0.965	(0.0485)	1.068	(0.104)	0.941	(0.0743)	0.970	(0.0821)
Subjective household wealth assessment:								
fairly well off	0.875*	(0.0628)	1.021	(0.320)	0.878	(0.0712)	1.193	(0.472)
around national average	0.833***	(0.0559)	1.014	(0.315)	0.839**	(0.0618)	1.172	(0.459)
fairly poor	0.847**	(0.0605)	1.070	(0.335)	0.808**	(0.0673)	1.205	(0.474)
poor	0.692***	(0.0577)	0.983	(0.309)	0.557***	(0.0602)	1.216	(0.487)
Non-sibling members	0.988	(0.0332)	0.849***	(0.0496)	1.055	(0.0604)	1.073	(0.0600)
Birth index	1.108	(0.0827)	1.438**	(0.242)	1.066	(0.134)	0.849	(0.0892)
Birth index same sex	0.988	(0.0935)	1.085	(0.243)	0.865	(0.133)	1.000	(0.127)
Sibling ratio transited	1.186***	(0.0412)	1.000	(0.103)	1.289***	(0.0809)	1.075	(0.0484)
Time-varying covariates:								
Siblings who have left school	0.901**	(0.0435)	0.350***	(0.0962)	1.231**	(0.118)	1.096**	(0.0485)
Siblings in unemployment	0.589***	(0.0685)	1.662	(0.906)	0.466***	(0.0674)	0.328**	(0.170)
Siblings in inactivity	0.395***	(0.0302)	1.173	(0.332)	0.257***	(0.0387)	0.368***	(0.0377)
Siblings in wage employment	0.919	(0.0542)	0.821	(0.354)	0.689***	(0.0833)	0.896*	(0.0524)
Observations	9 033		1 033		5 168		2 832	
Subjects	6 363		756		3 198		2 409	
Failures	5 088		537		2 340		2 211	
Clusters	5 228		619		2 717		1 892	

Note: Standard errors clustered on household identifiers.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table 6.4 Hazard ratios obtained from Gompertz regression with frailty, sons and daughters of heads of households, including direct transitions

	All regions		SSA		EECA		Asia	
Age	0.984**	(0.00683)	0.979	(0.0197)	1.000	(0.0124)	0.985	(0.00935)
Male	1.243***	(0.0518)	1.285*	(0.166)	1.621***	(0.117)	1.013	(0.0583)
Household size	1.016	(0.0137)	1.056**	(0.0240)	1.050	(0.0330)	0.985	(0.0179)
Elementary education	1.800***	(0.2678)					2.042***	(0.0178)
Secondary education	1.027	(0.0535)	0.903	(0.126)	1.050	(0.108)	1.163**	(0.0782)
Tertiary education	1.447***	(0.0927)	0.889	(0.267)	1.716***	(0.165)	1.102	(0.107)
Marital status:								
engaged	0.822	(0.107)	0.920	(0.180)	0.816	(0.183)	1.244	(0.339)
married	1.015	(0.0795)	0.874	(0.212)	0.816	(0.117)	1.072	(0.114)
divorced	0.679***	(0.0921)	0.305**	(0.146)	0.675**	(0.128)	0.859	(0.236)
widow	1.127	(0.429)	8.977**	(8.865)	0.542	(0.435)	0.968	(0.462)
Children	0.987	(0.0790)	1.084	(0.201)	1.030	(0.145)	0.897	(0.103)

	All regions		SSA		EECA		Asia	
Subjective household wealth assessment:								
fairly well off	0.778**	(0.0927)	1.018	(0.561)	0.816	(0.120)	1.184	(0.609)
around national average	0.713***	(0.0787)	1.070	(0.563)	0.731**	(0.0973)	1.137	(0.573)
fairly poor	0.729***	(0.0847)	1.270	(0.670)	0.690**	(0.102)	1.169	(0.592)
poor	0.560***	(0.0728)	1.033	(0.554)	0.434***	(0.0761)	1.235	(0.642)
Non-sibling members	0.955	(0.0513)	0.738***	(0.0720)	1.032	(0.108)	1.082	(0.0896)
Birth index	1.438***	(0.151)	2.439***	(0.741)	1.461**	(0.264)	1.000	(0.144)
Birth index same sex	0.947	(0.124)	1.080	(0.393)	0.812	(0.184)	0.895	(0.162)
Ratio of transited siblings	1.100*	(0.0631)	0.848	(0.162)	1.052	(0.111)	1.037	(0.0759)
Time-varying covariates:								
Siblings who have left school	0.701***	(0.0471)	0.132***	(0.0343)	0.992	(0.135)	0.941	(0.0758)
Siblings in unemployment	0.653***	(0.0966)	3.340*	(2.355)	0.498***	(0.0978)	0.322*	(0.201)
Siblings in inactivity	0.354***	(0.0359)	1.302	(0.396)	0.207***	(0.0377)	0.373***	(0.0537)
Siblings in wage employment	0.831**	(0.0696)	0.601	(0.250)	0.509***	(0.0809)	0.903	(0.0896)
Constant	0.254***	(0.0750)	0.234*	(0.182)	0.122***	(0.0533)	0.0953***	(0.0571)
Observations	9 033		1 033		5 168		2 832	
Number of groups	5 228		619		2 717		1 892	
Subjects	6 363		756		3 198		2 409	
Failures	5 088		537		2 340		2 211	
γ	0.984***	(0.00120)	0.948***	(0.00512)	0.993***	(0.00186)	0.989***	(0.00175)
ln θ	0.794***	(0.0388)	0.714***	(0.0939)	1.272***	(0.0833)	0.512***	(0.0375)
	1.016	(0.0137)	1.056**	(0.0240)	1.050	(0.0330)	0.985	(0.0179)

Note: *** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

6.2 Transiting into employment: A competing risk setting

In this scenario, transitions into and out of states in the labour market are assumed to result from an underlying continuous-time process of competing risks (individuals can be in one of several states in the labour market; these states are mutually exclusive but the realization of one does not preclude the realization of another at a different time). In the case of competing risks, we estimate exits from a baseline state in the labour market to several possible states. Assuming independence of the hazard rates associated with these labour market states, the competing risk model becomes straightforward to estimate (Jenkins, 2005). As previously stated, in multiple spell data, treating the occurrence of numerous spells for individuals by simply pooling them requires that spell lengths for a given individual are uncorrelated. In the presence of unobserved heterogeneity, it is highly probable that this assumption is violated. However, allowing for unobserved individual heterogeneity is not straightforward in a competing risk setting. We are therefore compelled to remain in the single-spell setting, taking into account only one transition per individual: that from school to work.

We still consider subjects to be at risk once they are in unemployment or inactivity (referred to as non-employment). Individuals are at risk of transiting into one of two states: wage employment or other employment (essentially, self-employment). Modelling the exit into either of these states separately implies an assumption of independence between states, since exits to the unmodelled state will be treated as censored observations. Fine and Gray (1999) developed a competing risk estimator, based on the

cumulative incidence function. This implies that the instantaneous risk of transiting into wage employment can be modelled as conditional on not having transited into self-employment.

Tables 6.5 and 6.6 show the results of competing risk regressions, run on all three regions, with time-varying covariates. The results show, first, that distinguishing between different types of employment is of paramount importance. The "siblings who have left school" variable, previously negatively correlated with transition into employment, is now seen to be negatively correlated with transition into wage employment and positively correlated with transition into self-employment. What was captured before was therefore not a negative influence per se of siblings who have left school on all employment, it might instead have reflected the fact that sibling correlations or information sharing only applies when siblings are looking for the same type of outcomes. These correlations also hold when the full household samples (including all youth between 15-29 living in the household, whether they be siblings or not) are used.

Table 6.5 Subhazard ratios obtained from competing risk regression, sons and daughters of heads of households, including direct transitions

	Transitions from non-employment to wage employment							
	All regions		SSA		EECA		Asia	
Age	1.030***	(0.00547)	1.017	(0.0178)	1.043***	(0.00847)	1.023***	(0.00807)
Male	1.103***	(0.0374)	1.104	(0.132)	1 192***	(0.0600)	1.019	(0.0531)
Household size	0.992	(0.0115)	1.030	(0.0200)	0.955**	(0.0215)	0.993	(0.0171)
Elementary education	1.204*	(0.124)					1.155	(0.119)
Secondary education	1.122***	(0.0495)	1.347**	(0.177)	0.868**	(0.0627)	1.320***	(0.0803)
Tertiary education	1.400***	(0.0652)	1.338	(0.319)	1.435***	(0.0899)	1.423***	(0.111)
Marital status:								
engaged	0.692***	(0.0802)	0.404***	(0.0968)	1.017	(0.135)	0.513*	(0.189)
married	0.847**	(0.0550)	0.581**	(0.136)	0.923	(0.0895)	0.794**	(0.0803)
divorced	0.897	(0.0927)	0.318	(0.237)	0.978	(0.125)	1.031	(0.201)
widow	1.693*	(0.486)	3.908***	(1.422)	2.376***	(0.442)	1.306	(0.573)
Children	0.959	(0.0638)	1.264	(0.224)	0.886	(0.0838)	1.009	(0.109)
Subjective household wealth assessment:								
fairly well off	0.960	(0.0905)	0.980	(0.555)	0.944	(0.0972)	1.200	(0.674)
around national average	1.043	(0.0904)	1.141	(0.612)	1.034	(0.0960)	1.404	(0.776)
fairly poor	1.015	(0.0920)	0.968	(0.522)	0.861	(0.0865)	1.741	(0.964)
poor	0.811**	(0.0840)	0.912	(0.497)	0.645***	(0.0798)	1.466	(0.825)
Non-sibling members	1.083*	(0.0450)	0.915	(0.0838)	1.138*	(0.0786)	1.086	(0.0759)
Birth index	0.941	(0.0925)	1.576	(0.476)	0.878	(0.132)	0.800	(0.111)
Birth index same sex	0.991	(0.125)	0.886	(0.342)	1.133	(0.210)	0.946	(0.174)
Ratio of transited siblings	1.260***	(0.0617)	0.948	(0.171)	1.346***	(0.104)	1.249***	(0.0876)
Time-varying covariates:								
Siblings who have left school	0.535***	(0.0448)	0.387**	(0.154)	0.512***	(0.0762)	0.584***	(0.0628)
Siblings in unemployment	1.346**	(0.182)	0.865	(0.907)	1.526**	(0.280)	0.668	(0.455)
Siblings in inactivity	0.700***	(0.0773)	1.435	(0.566)	0.612***	(0.116)	0.673**	(0.106)
Siblings in wage employment	2.222***	(0.207)	1.400	(0.681)	1.996***	(0.336)	2.328***	(0.268)
Observations	12 515		1 510		6 362		4 643	
Subjects	6 482		783		3 277		2 422	
Failures	3 606		271		1 862		1 473	
Clusters	5 311		639		2 774		1 898	

Note: Standard errors clustered on household identifiers.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table 6.6 Subhazard ratios obtained from competing risk regression, sons and daughters of heads of households, including direct transitions

	Transitions from non-employment to self-employment							
	All regions		SSA		EECA		Asia	
Age	1.011*	(0.00636)	1.012	(0.0145)	1.006	(0.0132)	1.019**	(0.00867)
Male	1.099**	(0.0459)	0.920	(0.0917)	1.530***	(0.144)	1.021	(0.0564)
Household size	1.020*	(0.0112)	1.007	(0.0177)	1.100***	(0.0358)	1.010	(0.0158)
Elementary education	0.995	(0.0958)					0.991	(0.0992)
Secondary education	0.752***	(0.0337)	0.515***	(0.0611)	1.093	(0.103)	0.681***	(0.0420)
Tertiary education	0.422***	(0.0403)	0.535*	(0.190)	0.416***	(0.0596)	0.402***	(0.0555)
Marital status:								
engaged	1.290**	(0.151)	1.319*	(0.192)	1.013	(0.263)	1.371	(0.373)
married	1.201***	(0.0828)	1.316*	(0.217)	0.914	(0.152)	1.188*	(0.108)
divorced	0.883	(0.122)	0.831	(0.230)	0.855	(0.181)	0.839	(0.226)
widow	0.867	(0.290)	3.497***	(1.443)	2.845	(2.273)	0.525	(0.213)
Children	1.032	(0.0716)	0.932	(0.132)	1.121	(0.173)	1.039	(0.100)
Subjective household wealth assessment:								
fairly well off	0.956	(0.114)	0.935	(0.340)	0.957	(0.136)	1.039	(0.426)
around national average	0.834	(0.0931)	0.813	(0.280)	0.897	(0.114)	0.765	(0.308)
fairly poor	0.923	(0.110)	0.933	(0.324)	1.315*	(0.197)	0.742	(0.300)
poor	0.871	(0.114)	0.946	(0.330)	0.886	(0.175)	0.781	(0.326)
Respondents	0.931	(0.0417)	0.825***	(0.0614)	0.929	(0.0967)	1.032	(0.0733)
Birth index	1.203	(0.138)	1.132	(0.284)	1.406	(0.357)	1.152	(0.173)
Birth index same sex	0.957	(0.137)	1.118	(0.343)	0.694	(0.212)	0.899	(0.171)
Ratio of transited siblings	1.198***	(0.0646)	1.219	(0.172)	1.344**	(0.164)	1.115	(0.0755)
Time-varying covariates:								
Siblings who have left school	1.336***	(0.0756)	0.494***	(0.129)	1.737***	(0.247)	1.386***	(0.0957)
Siblings in unemployment	0.364***	(0.0810)	2.337	(1.353)	0.217***	(0.0614)	0.634	(0.367)
Siblings in inactivity	0.248***	(0.0278)	0.764	(0.232)	0.161***	(0.0435)	0.238***	(0.0372)
Siblings in wage employment	0.340***	(0.0355)	0.464	(0.259)	0.230***	(0.0504)	0.360***	(0.0444)
Observations	15 323		1 442		8 978		4 903	
Subjects	6 498		762		3 297		2 439	
Failures	2 308		349		704		1 255	
Clusters	5 338		624		2 800		1 914	

Note: Standard errors clustered on household identifiers.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

The birth order indices, which were previously indicative of gender-biased information sharing, now give ambiguous results. In fact, when sons and daughters alone are considered, the birth index is positively correlated to transition into self-employment but not into wage employment. The same sex birth index is, however, not significant in either case. If wage employment does indeed represent a better labour market outcome in the countries observed, and if being born later implies worse educational outcomes,[13] it would be natural to find that later-born siblings would resort to self-employment rather than to wage employment. When we run a Gompertz model with frailty considering wage employment as the unique failure event,[14] the birth order index is positive and significant.

[13] This seems to be the case. As a test, we run a probit for tertiary education on birth index by country, for all individuals who have left education. In all countries, except Malawi, the coefficient proves to be negative.

[14] Thus considering the hypothetical situation where individuals can transit only into wage employment.

It therefore seems plausible that when allowance is made for observed heterogeneity, being later-born does increase the chances of transition into wage employment.

6.3 Robustness checks and alternative interpretations

It could be argued that being later-born dictates that an individual will enter the labour market at a later date, and that the point at which one enters the labour market is actually what determines the quality and length of the transition. We therefore add the year of entrance to the labour market as a dummy variable in the regressions in tables 6.3 and 6.4. The dummies are jointly significant, but do not influence the coefficients or significance of our variables of interest. They do, however, modify the coefficient of age, rendering it positive and significant in the global, EECA and Asia samples, in both the the Cox and the Gompertz regressions. It therefore appears that the coefficient of age is influenced by the year of entry to the labour market and that, once this is controlled for, age is strictly positively correlated to hazard.

Another issue is that of aggregation. It might not seem reasonable to aggregate countries which, despite being geographically close, might encompass widely different labour markets. The statistics on individuals and their transitions in section 4 did suggest that labour market dynamics do differ within our three zones, but do not give much information about the intra-zone heterogeneity that might prevail. A minimum check for consistency would be to observe similar coefficients when regressions are run at the country level. Such a test is undertaken in tables 6.7 and 6.8, bearing in mind that sample sizes imply that some countries' results should be interpreted with caution.

The tables show that, in most cases, the proportion of transited siblings reduces transition times, whether we look at transition to wage employment or transition to self-employment. Only in one case (Kyrgyzstan) is this share negatively and significantly correlated to transition hazard. Furthermore, the number of sibling (or household members) wage earners is positively correlated to transition to wage employment and negatively correlated to transition to self-employment in all countries, although results are not always significant. Considering sibling unemployment and inactivity, results are more heterogeneous. While having unemployed or inactive siblings is negatively associated with transition to self-employment in the Asia and EECA countries, this factor is less clear in the SSA sample. Regarding the transition to wage employment, the covariates are mostly positively correlated, although exceptions exist. Our interpretation is that unemployed siblings, while diminishing the power of the social network, are also an indicator of the desire to obtain quality employment, and that this desire is frequently common among siblings. Nevertheless, these tables show that correlations between siblings are not only aggregate, but in most cases reflect evidence at the country level.

Table 6.7 Competing risk model by country, all household members, including direct transitions

	Benin	Liberia	Malawi	United Rep. of Tanzania	Armenia	Kyrgyzstan	Ukraine	FYR Macedonia	Viet Nam	Cambodia	Nepal
Time to first wage employment											
Ratio of transited respondents	+	(+)	(-)	+	(+)	(+)	(+)	+	+	(+)	+
Time-varying covariates:											
Respondent in unemp.	+	+	+	(+)	(+)	+	(+)	+	(+)		(-)
Respondent in inactivity	+	-	+	(+)	(-)	(-)	(+)	(-)	(-)	-	(-)
Respondent in wage emp.	(+)	+	+	+	(+)	+	+	+	+	+	+
Time to first self-employment											
Ratio of transited respondents	+	(+)	(+)	(+)	(-)	+	(-)	+	(+)	(+)	
Time-varying covariates:											
Respondent in unemp.	(+)	(-)	(-)	(-)	-	(-)	(-)	-	(-)		
Respondent in inactivity	+	(-)	-	-	-	-	-	-	-	-	
Respondent in wage emp.	(-)	-	(-)	-	-	-	-	-	-	-	

Note: Significant (at the 10 per cent level) positive or negative coefficients are denoted by + and -.
Positive or negative coefficients that are not significant are denoted by (+) and (-).
Empty cells indicate omitted variables or a highly singular covariance–variance matrix for that country's estimation.
Source: Author's calculations based on ILO SWTS data.

Table 6.8 Competing risk model by country, sons and daughters only, including direct transitions

	Benin	Liberia	Malawi	United Republic of Tanzania	Armenia	Kyrgyzstan	Ukraine	Macedonia	Viet Nam	Cambodia	Nepal
Time to first wage employment											
Ratio of siblings transited	(-)		(+)	(-)	+	(-)	+	+	+	+	+
Time-varying covariates:											
Siblings in unemployment	(+)		+	-	(-)	(+)	(-)	+	(+)		-
Siblings in inactivity	(+)		+	(+)	-	(-)	(+)	(-)	(+)	-	(+)
Siblings in wage employment	(+)		(+)	+	(+)	+	(+)	+	+	+	(+)

	Time to first self-employment								
Ratio of siblings transited	(+)	(+)	(-)	(+)	(-)	-	+	+	(-)
Time-varying covariates:									
Siblings in unemployment	(+)	-	+		-	(-)	-	(-)	
Siblings in inactivity	(+)		(-)	-	-	-	-	-	-
Siblings in wage employment	(-)		-	(-)	-	-	-	-	-

Note: Significant (at the 10 per cent level) positive or negative coefficients are denoted by + and -.
Positive or negative coefficients that are not significant are denoted by (+) and (-).
Empty cells indicate omitted variables or a highly singular covariance–variance matrix for that country's estimation.
Source: Author's calculations based on ILO SWTS data.

7. Concluding remarks

In the previous sections, we have shown evidence of intra-household correlations in labour market transitions, in both a static and a dynamic context. Although we cannot disentangle the mechanisms at play, birth order does influence transition probabilities between various states in the labour market. In particular, when only sons and daughters of the heads of households are considered, having a large number of older siblings increases the hazard rate of transition, including when frailty is introduced. Information sharing is a plausible explanation for this finding.

Results from a multinomial logit suggest that sibling inactivity negatively influences the probability of being in the labour market. When a linear probability model with fixed effects is used, however, siblings' average length of time in inactivity contributes positively to the transition hazard in EECA countries (when the full household sample including all youth between 15-29 living in the household, whether they be siblings or not, is used). The same result is obtained for sons and daughters when frailty is used in the survival setting.

In our preferred model, including time-varying covariates, the number of siblings who have left school positively influences transition hazard in Asia and EECA, but not in SSA. Sibling unemployment and inactivity generally contribute negatively to hazard, even when frailty is accounted for, although the SSA results seem to differ from those of the Asia and EECA countries. This finding contrasts with the results of the approach that does not utilize time-varying covariates and underlines the importance of taking the timing of events into account. The impact of sibling wage employment is ambiguous, but generally negative. This probably reflects differential effects which are dependent on the type of employment considered. Concentrating on transitions into wage employment and self-employment in a competing risk framework, the impact of sibling wage employment is significant and positive for transitions into wage employment and significant and negative for transitions into self-employment. To sum up, by exploiting the time-varying nature of labour market transition, we find indications of sibling convergence in the labour market that go beyond simple family effects. The effects are, however, difficult to quantify and vary across regions and countries. Furthermore, they suggest that labour market dynamics in SSA countries differ from those in the Asia and EECA samples.

Finally, asking whether siblings exert a mutual influence over each other in education and in the labour market might seem like a purely academic undertaking, with little relevance to policy-makers. The literature on sibling correlations has, to date, concentrated on developed countries, and has shown correlations in income, education

and wages across siblings, even at later stages in life. Such correlations imply that policy aimed at individuals is likely to be associated with spillover effects on siblings, although the magnitude of these effects and their applicability to large-scale programmes are inherently hard to predict. The theory of spillover effects from sibling success is intrinsically linked to the origin of convergence. From a policy perspective, it is important to distinguish common endowment effects from direct sibling effects, as only the latter are likely to be associated with spillover effects. The present study finds new evidence of sibling correlations in employment trajectories in a large panel of developing countries, suggesting that information sharing operates successfully among siblings in the three regions studied. These results have implications for the relevance of educational schemes, job-search training and other measures that aim to increase the employability of youth. Further research should focus on disentangling the mechanisms behind sibling convergence, as well as quantifying its magnitude.

References

Abbring, J.H.; Van Den Berg, G.J. 2007. "The unobserved heterogeneity distribution in duration analysis", in *Biometrika*, Vol. 94, No. 1, pp. 87–99.

Assaad, R.; Binzel, C.; Gadallah, M. 2010. "Transitions to employment and marriage among young men in Egypt", in *Middle East Development Journal*, Vol. 2, No. 01, pp. 39–88.

Becker, G.S. 1962. "Investment in human capital: A theoretical analysis", in *Journal of Political Economy*, Vol. 70, p. 9.

—; Lewis, H.G. 1973. "On the interaction between the quantity and quality of children", in *Journal of Political Economy*, Vol. 81, No. 2, pp. S279–88.

—; Tomes, N. 1994. "Human capital and the rise and fall of families", in *Human capital: A theoretical and empirical analysis with special reference to education* (3rd edn) (University of Chicago Press), pp. 257–298.

Behrman, J.R.; Taubman, P. 1986. "Birth order, schooling, and earnings", in *Journal of Labor Economics*, Vol. 4, No. 3, pp. S121–145.

—; Pollak, R.A.; Taubman, P. 1989. "Family resources, family size, and access to financing for college education", in *The Journal of Political Economy*, pp. 398–419.

—; Ross, D.; Sabot, R. (2008). Improving quality versus increasing the quantity of schooling: Estimates of rates of return from rural Pakistan, in *Journal of Development Economics*, 85(1), 94-104.

Black, S.E.; Devereux, P.J.; Salvanes, K.G. 2005. "The more the merrier? The effect of family size and birth order on children's education", in *Quarterly Journal of Economics*, Vol. 120, No. 2, pp. 669–700.

Blake, J. 1981. "Family size and the quality of children", in *Demography*, Vol. 18, No. 4, pp. 421–442.

Booth, A.L; Kee, H.J. 2009. "Birth order matters: The effect of family size and birth order on educational attainment", in *Journal of Population Economics*, Vol. 22, No. 2, pp. 367–397.

Bover, O.; Arellano, M.; Bentolila, S. 2002. "Unemployment duration, benefit duration and the business cycle", in *The Economic Journal*, Vol. 112, No. 479, pp. 223–265.

Calvès, A.E.; Kobiané, J.-F.; N'Bouké, A. 2013. "Privatization of education and labor force inequality in urban Francophone Africa: The transition from school to work in Ouagadougou", in *World Development*, Vol. 47(C), pp. 136–148.

Calvó-Armengol, A.; Jackson, M.O. 2010. "Peer pressure", in *Journal of the European Economic Association*, Vol. 8, No. 1, pp. 62–89.

Chuang, H.-L. 1999. "Estimating the determinants of the unemployment duration for college graduates in Taiwan", in *Applied Economics Letters*, Vol. 6, No. 10, pp. 677–681.

Conley, D.; Glauber, R. 2007. "Family background, race, and labor market inequality", in *The ANNALS of the American Academy of Political and Social Science*, Vol. 609, No. 1, pp. 134–152.

de Haan, M. 2010. "Birth order, family size and educational attainment", in *Economics of Education Review*, Vol. 29, No. 4, p. 576–588.

Doiron, D.; Gørgens, T. 2008. "State dependence in youth labor market experiences, and the evaluation of policy interventions", in *Journal of Econometrics*, Vol. 145, No. 1, pp. 81–97.

Dolton, P.J.; Makepeace, G.H.; Treble, J.G. 1994. "The youth training scheme and the school-to-work transition", in *Oxford Economic Papers*, Vol. 46, No. 4, pp. 629–657.

Elder, S.; Koné, S.K. 2014. *Labour market transitions of young women and men in sub-Saharan Africa* Work4Youth Publication Series No. 9 (Geneva, International Labour Office).

Emerson, P.M.; Souza, A. 2008. "Birth order, child labor, and school attendance in Brazil", in *World Development*, Vol. 36, No. 9, pp. 1647–1664.

Fafchamps, M.; Minten, B. 2002. "Returns to social network capital among traders" in *Oxford Economic Papers*, Vol. 54, No. 2, pp. 173–206.

Fine, J.P.; Gray, R.J. 1999. "A proportional hazards model for the subdistribution of a competing risk", in *Journal of the American Statistical Association*, Vol. 94, No. 446, pp. 496–509.

Frijters, P.; Lindeboom, M.; Van Den Berg, G.J. 2009. *Persistencies in the labour market*, IZA Discussion Paper No. 4025 (Feb.) (Bonn, Institute for the Study of Labor (IZA).

Galiani, S.; Hopenhayn, H.A. 2003. "Duration and risk of unemployment in Argentina", in *Journal of Development Economics*, Vol. 71, No. 1, pp. 199–212.

Golsteyn, B. H., Grönqvist, H., & Lindahl, L. (2014). "Adolescent time preferences predict lifetime outcomes", in *The Economic Journal*, 124(580), F739-F761.

Gutierrez, R.G. 2002. "Parametric frailty and shared frailty survival models", in *Stata Journal*, Vol. 2, No. 1, pp. 22–44.

Hakim, C. 2000. *Work–lifestyle choices in the 21st century: Preference theory* (Oxford University Press).

Ham, J.C.; Rea Jr, S.A. 1987. "Unemployment insurance and male unemployment duration in Canada", in *Journal of Labor Economics*, Vol. 5, No. 3, pp. 325–353.

Hanushek, E.A. 1992. "The trade-off between child quantity and quality", in *Journal of Political Economy*, Vol. 100, No.1, pp. 84–117.

—. 2009. "The economic value of education and cognitive skills", in *Handbook of education policy research*, pp. 39–56.

Heckman, J.J.; Borjas, G.J. 1980. "Does unemployment cause future unemployment? Definitions, questions and answers from a continuous time model of heterogeneity and state dependence", in *Economica*, Vol. 47, No. 187, pp. 247–283.

Hensvik, L.; Nordström Skans, O. 2013. *Social networks, employee selection and labor market outcomes*, Working Paper (IFAU-Institute for Evaluation of Labour Market and Education Policy).

Jackson, M.O. 2010. "An overview of social networks and economic applications", in *Handbook of social economics*, Vol. 1, pp. 511–85.

Jenkins, S.P. 2005. *Survival analysis*, Unpublished manuscript (Institute for Social and Economic Research, University of Essex, Colchester, UK).

Lauer, C. 2003. *Education and unemployment: A French–German comparison*, Technical Report, ZEW Discussion Papers.

Levine, D.I.; Mazumder, B. 2007. “The growing importance of family: Evidence from brothers’ earnings”, in *Industrial Relations: A Journal of Economy and Society*, Vol. 46, No. 1, pp. 7–21.

Lim, H.-E. 2011. “The determinants of individual unemployment duration: The case of Malaysian graduates”, in *Journal of Global Management*, Vol. 2, No. 1, pp. 184–203.

Lindskog, A. 2011. *The effect of older siblings’ literacy on school entry and primary school progress in the Ethiopian Highlands*, Working Papers in Economics No. 495 (University of Gothenburg, Department of Economics).

Lynch, L.M. 1985. “State dependency in youth unemployment: A lost generation?”, in *Journal of Econometrics*, Vol. 28, No. 1, pp. 71–84.

Lyngstad, T.H.; Prskawetz, A. 2010. “Do siblings’ fertility decisions influence each other?”, in *Demography*, Vol. 47, No. 4, pp. 923–934.

McRae, S. 2003. “Constraints and choices in mothers’ employment careers: A consideration of Hakim’s preference theory”, in *The British Journal of Sociology*, Vol. 54, No. 3, pp. 317–338.

Mincer, J. 1958. “Investment in human capital and personal income distribution”, in *Journal of Political Economy*, Vol. 66, No. 4, pp. 281–302.

—. 1991. *Education and unemployment*, Technical Report (Cambridge, MA, National Bureau of Economic Research).

Montgomery, J.D. 1991. “Social networks and labor-market outcomes: Toward an economic analysis”, in *The American Economic Review*, pp. 1408–1418.

Nordman, C.J.; Pasquier-Doumer, L. 2013. *Transition in a West-African labor market: The role of social networks*, Working Paper DT/2013-12.

Orazem, P.F. 2007. *A pictorial analysis of the Sri Lankan school-to-work transition* (Department of Economics, Iowa State University).

Palladino Schultheiss, D.E.; Kress, H.M.; Manzi, A.J.; Jeffrea Glasscock, J.M. 2001. “Relational influences in career development: A qualitative inquiry”, in *The Counseling Psychologist*, Vol. 29, No. 2, pp. 216–241.

—; Palma, T.V.; Predragovich, K.S.; Jeffrey Glasscock, J.M. 2002. “Relational influences on career paths: Siblings in context”, in *Journal of Counseling Psychology*, Vol. 49, No. 3, pp. 302–310.

Pellizzari, M. 2010. “Do friends and relatives really help in getting a good job?”, in *Industrial & Labor Relations Review*, Vol. 63, No. 3, pp. 494–510.

Psacharopoulos, G.; Patrinos, H.A. 2004. “Returns to investment in education: A further update”, in *Education Economics*, Vol. 12, No. 2, pp. 111–134.

Pugatch, T. 2012. *Bumpy rides: School-to-work transitions in South Africa*, Technical Report. Discussion Paper Series (Forschungsinstitut zur Zukunft der Arbeit).

Reuben, E.; Wiswall, M.; Zafar, B. 2013. *Preferences and biases in educational choices and labor market expectations: Shrinking the black box of gender*, Staff Report (Federal Reserve Bank of New York).

Riddell, W.C.; Song, X. 2011. “The impact of education on unemployment incidence and re-employment success: Evidence from the US labour market”, in *Labour Economics*, Vol. 18, No. 4, pp. 453–463.

Ryan, P. 2001. “The school-to-work transition: A cross-national perspective”, in *Journal of Economic Literature*, Vol. 39, No. 1, pp. 34–92.

Salas-Velasco, M. 2007. “The transition from higher education to employment in Europe: The analysis of the time to obtain the first job”, in *Higher Education*, Vol. 54, No. 3, pp. 333–360.

Sayre, E.; Daoud, Y. 2009. *Labor market regulations and unemployment duration and in Palestine*, Working Paper (University of Southern Mississippi).

Schmillen, A.; Möller, J. 2012. “Distribution and determinants of lifetime unemployment”, in *Labour Economics*, Vol. 19, No. 1, pp. 33–47.

Schultz, T.W. 1960. “Capital formation by education”, in *Journal of Political Economy*, Vol. 68, 571 pp.

Solon, G.; Corcoran, M.; Gordon, R.; Laren, D. 1991. “A longitudinal analysis of sibling correlations in economic status”, in *Journal of Human Resources*, Vol. 26, No. 3, pp. 509–534.

Therneau, T.M.; Grambsch, P.M. (2000). *Modeling survival data: Extending the Cox model* (New York, Springer-Verlag).

Understanding Children’s Work (UCW). 2015. *Pathways to work in the developing world: An analysis of young persons’ transition from school to the workplace*. Mimeo.

Annex I Additional statistical tables

Table A.1 Relative risk ratios from multinomial logit regression, sons and daughters of heads of households

	All regions			SSA			EECA			Asia		
	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.
Age	1.152***	1.133***	1.050***	1.077**	1.095***	1.125***	1.235***	1.193***	1.066**	1.101***	1.106***	0.953
Male	1.491***	1.373***	1.196*	1.673**	1.110	1.101	1.818***	2.274***	1.381**	1.159	1.056	1.211
Elementary education	0.766	0.858	1.966**	0.700	1.021	2.283**	6.182e+06***	0.729	0.797	0.732	0.856	1.865
Secondary education	0.800**	0.718***	1.277*	0.762	0.624***	1.043	0.763	0.896	1.292	0.919	0.654**	1.151
Tertiary education	3.136***	0.815	2.648***	8.121***	1.524	5.335***	2.805***	0.759	1.995***	2.697***	0.779	8.027***
Subjective household wealth assessment:												
fairly well off	0.230***	0.191***	0.229***	0.563	0.283	1.174	0.222***	0.164***	0.221***	4.520	1.045	0.107
around national average	0.253***	0.196***	0.298***	0.609	0.290	1.184	0.214***	0.160***	0.255***	9.053	1.197	0.243
fairly poor	0.228***	0.141***	0.244***	0.459	0.190**	0.662	0.190***	0.202***	0.267***	9.665	0.667	0.134
poor	0.197***	0.141***	0.354***	0.826	0.374	1.521	0.113***	0.112***	0.309***	3.645	0.191	0.0576*
Marital status:												
engaged	0.843	0.890	0.739	1.304	0.851	1.578	0.687	0.578	0.344***	0.937	2.260	0.575
married	0.483***	0.921	0.446***	0.754	1.385	0.818	0.406***	0.596***	0.379***	0.437***	0.949	0.382***
divorced	0.382***	0.620***	0.412***	0.481	1.373	1.205	0.226***	0.294***	0.205***	1.616	1.279	1.49e-06***
widow	0.703	0.407	1.448	7.76e-06***	0.308	1.629	2.430e+06***	2.814e+06***	0.708	0.613	0.250	5.064
Urban	1.171*	1.033	1.168	1.927***	1.006	1.796**	1.137	1.335**	0.953	1.127	0.759	1.242
Siblings	0.998	1.009	0.982	0.990	0.998	0.930	1.044	1.111	0.990	1.034	1.021	0.809
Older siblings	0.688***	0.991	0.776*	0.734	0.953	0.922	0.740	1.322	0.933	0.546***	0.841	0.426*
Older siblings same sex	1.338**	1.252	1.198	1.142	1.215	1.268	1.225	0.998	0.902	1.750**	1.547	2.415*
Past unemployment spells	4.852***	2.175***	1.484**	7.254***	3.051*	4.705**	4.689***	2.003***	1.200	15.60***	10.09**	15.90**

	All regions			SSA			EECA			Asia		
	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.
Past wage employment spells	0.913	0.973	1.443***	1.427	1.344	1.795**	0.854	0.857	1.446***	0.850	1.005	1.159
Past inactivity spells	1.848***	1.303*	1.510**	1.109	0.721	0.784	1.918***	1.202	1.519*	3.029***	2.497**	2.428*
Siblings' unemployment spells	0.527***	0.656**	1.051	0.526	0.640	1.067	0.590**	0.475**	1.234	0.642	1.659	1.264
Siblings' inactivity spells	0.741**	0.928	0.933	0.998	0.938	0.846	0.738*	0.710	0.753	0.795	1.115	1.371
Siblings' wage employment spells	1.653***	1.183	1.100	1.696	2.498**	2.422**	1.357	1.141	0.827	2.379***	1.304	2.667**
Siblings' length of unemployment	1.004	0.996	1.010**	1.026	1.004	0.955**	1.003	0.996	1.008	0.973	0.979	1.001
Siblings' length of inactivity	0.999	0.994*	1.002	0.987	0.998	1.006	0.999	0.990*	1.000	0.998	0.993	1.005
Siblings' length of wage employment	1.002	0.993**	0.998	1.008	0.987*	0.987	1.001	0.993	0.997	1.000	0.993	0.998
Constant	0.0228***	0.215***	0.0923***	0.0261***	0.279	0.00326***	7.16e-09***	0.0966***	0.996	0.0890	0.429	1.110
Observations	7 427	7 427	7 427	1 483	1 483	1 483	3 459	3 459	3 459	2 485	2 485	2 485

Standard errors are clustered at the household level.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.2 Relative risk ratios from multinomial logit regression, all household members

	All regions			SSA			EECA			Asia		
	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.	Wage emp.	Self-emp.	Unemp.
Age	1.141***	1.125***	1.058***	1.102***	1.110***	1.093***	1.202***	1.136***	1.039**	1.092***	1.101***	0.985
Male	2.106***	1.841***	1.476***	3.736***	2.039***	1.664***	2.088***	2.405***	1.496***	1.160	1.112	1.357
Elementary education	1.048	1.027	1.645***	0.998	1.134	1.578**	19.28**	1.621	1.860	0.771	0.655*	0.849
Secondary education	1.009	0.815***	1.254***	1.142	0.787***	1.250*	0.870	0.961	1.189	1.213	0.834	1.230
Tertiary education	3.123***	0.916	2.565***	5.494***	1.145	4.411***	2.866***	0.967	2.074***	3.658***	1.117	8.766***
Subjective household wealth assessment:												
fairly well off	0.673***	0.580***	0.805	0.844	1.192	2.224	0.641**	0.445***	0.651**	7.575	1.014	0.220
around national average	0.651***	0.504***	0.779	0.718	0.871	1.493	0.572***	0.402***	0.672**	14.43*	1.110	0.301
fairly poor	0.666***	0.448***	0.797	0.704	0.809	1.537	0.502***	0.498***	0.723	20.37**	0.849	0.274
Poor	0.575***	0.449***	1.037	0.840	1.021	2.251	0.361***	0.387***	0.920	6.109	0.222*	0.0877**

	All regions			SSA			EECA			Asia		
	Wage emp.	**Self-emp.**	**Unemp.**	**Wage emp.**	**Self-emp.**	**Unemp.**	**Wage emp.**	**Self-emp.**	**Unemp.**	**Wage emp.**	**Self-emp.**	**Unemp.**
Marital status:												
engaged	0.553***	0.712**	0.479***	0.770	1.007	0.701	0.364***	0.307***	0.277***	0.897	1.996	0.432
married	0.270***	0.657***	0.283***	0.614***	1.316***	0.795	0.156***	0.290***	0.144***	0.233***	0.613***	0.224***
divorced	0.597***	0.777*	0.453***	1.306	1.394*	1.029	0.330***	0.405***	0.241***	2.147	1.564	1.065
widow	1.536	1.502	1.553	3.754*	3.834**	1.408	432,062***	400,085***	755,868***	0.593	0.305	2.323
Urban	1.114**	0.723***	1.013	1.518***	0.716***	1.446***	1.000	0.883	0.727***	1.042	0.607***	0.974
Siblings	1.136***	1.101***	1.120**	0.962	1.008	1.052	1.462***	1.415***	1.372***	1.341***	1.292**	1.004
Older siblings	0.588***	0.932	0.744***	0.688***	0.987	0.837	0.536***	0.787**	0.673***	0.543***	0.915	0.770
Older siblings same sex	1.299***	0.979	1.126	1.355**	1.074	1.410**	1.131	0.947	0.826	1.168	0.862	1.004
Past unemployment spells	3.460***	1.656***	1.100	2.178***	1.343	1.604*	3.653***	1.664***	0.957	38.38***	21.26***	27.52***
Past wage employment spells	0.959	0.966	1.494***	1.264**	1.119	1.475***	0.918	0.832**	1.580***	0.784**	0.929	1.124
Past inactivity spells	1.400***	1.232***	1.164	1.073	1.119	0.898	1.618***	1.136	1.318**	1.789***	1.400	1.337
Siblings' unemployment spells	0.617***	0.679***	1.071	0.871	0.754*	0.947	0.633***	0.535***	1.137	0.379	0.994	1.228
Siblings' inactivity spells	1.333***	1.293***	1.145	1.241	1.009	0.977	1.485***	1.539***	1.270	1.147	1.247	1.054
Siblings' wage employment spells	1.353***	0.999	0.891	1.350**	1.214	0.906	1.198*	0.713**	0.761*	2.236***	1.454*	2.465***
Siblings' length of unemployment	1.003	0.997	1.007***	1.003	1.000	1.000	1.002	0.998	1.008**	0.985	0.989	0.999
Siblings' length of inactivity	0.998*	0.995***	0.997	0.996	0.995**	0.996	0.996	0.995**	0.996	0.999	0.994**	1.004
Siblings' length of wage employment	1.002	0.994***	1.002	1.004	0.993***	1.005	0.999	0.999	1.001	1.001	0.993**	0.995
Constant	0.0129***	0.117***	0.0416***	0.0106***	0.0539***	0.00458***	0.00103***	0.0366***	0.236**	0.0509**	0.532	1.058
Observations	16 186	16 186	16 186	6 162	6 162	6 162	6 117	6 117	6 117	3 907	3 907	3 907

Standard errors are clustered at the household level.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.3 Summary statistics, SSA, sons and daughters of heads of households

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
Age	5 296	18.833	3.624	15	29
Male	5 296	0.592	0.491	0	1
Married	5 296	0.04	0.195	0	1
Children	5 296	0.096	0.294	0	1
Siblings	5 296	1.22	1.25	1	8
Ever in school	5 296	0.883	0.321	0	1
Currently in school	5 296	0.671	0.47	0	1
Elementary education*	1 796	0.72	0.449	0	1
Secondary education*	1 796	0.278	0.448	0	1
Tertiary education*	1 796	0.029	0.168	0	1
Labour force	5 296	0.305	0.46	0	1
Labour force (relaxed)	5 296	0.349	0.477	0	1
Employed	1 614	0.874	0.332	0	1
Unemployed	1 614	0.126	0.332	0	1
Unemployed (relaxed)	1 849	0.237	0.425	0	1
Discouraged	438	0.139	0.347	0	1
Transited	4 925	0.148	0.356	0	1
In transition	4 925	0.215	0.411	0	1
Transition not started	4 925	0.636	0.481	0	1

Note: * Completed educational level, for those who have left school.
Source: Author's calculations based on ILO SWTS data.

Table A.4 Summary statistics, EECA, sons and daughters of heads of households

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
Age	7 656	20.84	4.11	15	29
Male	7 656	0.56	0.50	0	1
Married	7 656	0.10	0.30	0	1
Children	7 656	0.10	0.29	0	1
Siblings	7 656	0.60	0.73	0	4
Ever in school	7 656	1.00	0.06	0	1
Currently in school	7 656	0.54	0.50	0	1
Elementary education*	3 464	0.99	0.08	0	1
Secondary education*	3 464	0.74	0.44	0	1
Tertiary education†	3 464	0.25	0.43	0	1
Labour force	7 656	0.48	0.50	0	1
Labour force (relaxed)	7 656	0.51	0.50	0	1
Employed	3 659	0.77	0.42	0	1
Unemployed	3 659	0.23	0.42	0	1
Unemployed (relaxed)	3 872	0.28	0.45	0	1
Discouraged	1 072	0.10	0.30	0	1
Transited	7 636	0.32	0.47	0	1
In transition	7 636	0.23	0.42	0	1
Transition not started	7 636	0.45	0.50	0	1

Note: * Completed educational level, for those who have left school.
† Completed educational level, for those who have left school excluding Kyrgyzstan, where all tertiary education was labelled as vocational.
Source: Author's calculations based on ILO SWTS data.

Table A.5 Summary statistics, Asia, sons and daughters of heads of households

Variable	Observations	Mean	Std Dev.	Minimum	Maximum
Age	5 376	20.38	3.98	15	29
Male	5 376	0.48	0.50	0	1
Married	5 376	0.15	0.36	0	1
Children	5 376	0.11	0.31	0	1
Siblings	5 376	0.72	0.80	0	5
Ever in school	5 376	0.98	0.15	0	1
Currently in school	5 376	0.51	0.50	0	1
Elementary education*	2 485	0.95	0.22	0	1
Secondary education*	2 485	0.47	0.50	0	1
Tertiary education*	2 485	0.13	0.33	0	1
Labour force	5 376	0.59	0.49	0	1
Labour force (relaxed)	5 376	0.61	0.49	0	1
Employed	3 147	0.92	0.28	0	1
Unemployed	3 147	0.08	0.28	0	1
Unemployed (relaxed)	3 302	0.13	0.33	0	1
Discouraged	416	0.23	0.42	0	1
Transited	5 353	0.46	0.50	0	1
In transition	5 353	0.19	0.39	0	1
Transition not started	5 353	0.35	0.48	0	1

Note: * Completed educational level, for those who have left school.
Source: Author's calculations based on ILO SWTS data.

Table A.6 Coefficients from a linear probability model on employment

	Siblings only				All household members			
	All regions	SSA	EECA	Asia	All regions	SSA	EECA	Asia
Age	0.0118	0.0220	0.0167	-0.00393	0.00825*	0.0115*	0.00722	0.00212
Male	0.0186	0.0187	0.0448	-0.00167	0.0742***	0.0821***	0.116***	0.0350*
Elementary education	-0.0206	-0.0235	0.112	-0.0511	0.0322	0.0462	0.0405	0.00411
Secondary education	-0.0195	-0.0853	0.0110	-0.0212	-0.00610	0.0118	-0.0140	-0.00114
Tertiary education	-0.0136	0.130	-0.0141	-0.0329	0.0113	0.0421	0.0356	-0.0442
Older siblings	-0.0113	-0.0203	0.0216	-0.0634	-0.0248	-0.00238	-0.0451	-0.0321
Older siblings same sex	0.0228	0.0765	-0.0144	0.0520	0.0410**	0.0328	0.0503	0.0380
Total activities	0.0731**	0.0963	0.0992	0.0495	0.0834***	0.0746***	0.137***	0.0619**
Past unemployment spells	0.390***	0.374*	0.368***	0.603***	0.323***	0.191*	0.266***	0.605***
Past wage employment spells	-0.307***	-0.299**	-0.417***	-0.199***	-0.353***	-0.285***	-0.521***	-0.215***
Past inactivity spells	0.186***	0.0350	0.182	0.283***	0.215***	0.213***	0.160***	0.262***
Average of siblings' unemployment spells	0.458***	0.256*	0.482***	0.824***	0.394***	0.364***	0.382***	0.749***
Average of siblings' inactivity spells	0.249***	0.0664	0.254**	0.359***	0.297***	0.298***	0.282***	0.357***
Average of siblings' wage employment spells	-0.279***	-0.202*	-0.365***	-0.193***	-0.315***	-0.238***	-0.432***	-0.185***
Average length of sibling unemployment	0.000777	0.00335	0.000603	-0.00120	0.000301	-0.000351	0.000399	0.000296

	Siblings only				All household members			
	All regions	SSA	EECA	Asia	All regions	SSA	EECA	Asia
Average length of sibing inactivity	0.00134	0.00214	0.00206	0.000176	0.000694	-0.000572	0.00131*	0.000597
Average length of sibling wage employment	0.000156	-0.000127	0.000539	-1.17e-05	-0.000130	-0.000229	7.52e-05	8.14e-05
Constant	0.291	0.00439	-0.127	0.868***	0.246**	0.143	0.109	0.580***
Observations	7 537	1 588	3 464	2 485	16 522	6 488	6 126	3 908
R^2	0.938	0.897	0.966	0.916	0.899	0.876	0.924	0.894

Note: Robust standard errors.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.7 Hazard ratios obtained from Cox regression, sons and daughters only, including direct transitions

	All regions		SSA		EECA		Asia	
Age	0.997	(0.00431)	0.983	(0.0107)	1.015**	(0.00733)	0.993	(0.00632)
Male	1 129***	(0.0307)	1.026	(0.0731)	1.345***	(0.0600)	1.013	(0.0402)
Household size	0.984*	(0.00845)	0.993	(0.0120)	0.977	(0.0183)	0.985	(0.0107)
Elementary education	1.511***	(0.134)					1.636***	(0.173)
Secondary education	0.984	(0.0319)	0.849**	(0.0606)	0.992	(0.0596)	1.081*	(0.0510)
Tertiary education	1.242***	(0.0470)	0.893	(0.161)	1.385***	(0.0784)	1.081	(0.0595)
Marital status:								
engaged	0.907	(0.0839)	0.900	(0.102)	0.888	(0.112)	1.316***	(0.133)
married	1.021	(0.0512)	0.973	(0.139)	0.918	(0.0739)	1.022	(0.0803)
divorced	0.795***	(0.0705)	0.598*	(0.158)	0.793**	(0.0881)	0.752	(0.207)
widow	0.926	(0.229)	1.960***	(0.396)	0.788	(0.340)	0.860	(0.279)
Children	0.964	(0.0485)	1.074	(0.105)	0.954	(0.0738)	0.930	(0.0776)
Subjective household wealth assessment:								
fairly well off	0.861**	(0.0607)	0.873	(0.256)	0.853*	(0.0695)	1.229	(0.468)
around national average	0.815***	(0.0534)	0.864	(0.252)	0.827***	(0.0607)	1.165	(0.439)
fairly poor	0.808***	(0.0568)	0.850	(0.249)	0.789***	(0.0656)	1.189	(0.449)
poor	0.685***	(0.0564)	0.879	(0.258)	0.563***	(0.0607)	1.179	(0.456)
Non-sibling members	1.010	(0.0360)	0.916	(0.0509)	1.084	(0.0626)	1.075	(0.0593)
Birth index	1.097	(0.0813)	0.995	(0.183)	1.162	(0.145)	0.990	(0.104)
Birth index same sex	0.948	(0.0926)	1.009	(0.226)	0.938	(0.149)	0.945	(0.133)
Razio of transited siblings.	1.136***	(0.0432)	0.909	(0.103)	1.255***	(0.0849)	1.118**	(0.0578)
Siblings' length of unemployment	0.991***	(0.00148)	0.995	(0.00780)	0.991***	(0.00158)	0.989*	(0.00663)
Siblings' length of inactivity	0.992***	(0.00116)	0.989**	(0.00444)	0.993***	(0.00218)	0.990***	(0.00160)
Siblings' length of wage employment	1.000	(0.000703)	0.998	(0.00407)	1.000	(0.00131)	1.000	(0.000923)
Observations	8 703		879		4 934		2 890	
Subjects	6 326		724		3 188		2 414	
Failures	5 067		537		2 325		2 205	
Clusters	5 210		605		2 711		1 894	

Note: Robust standard errors in parentheses.
*** p <0.01, ** p <0.05, * p <0.1.
Standard errors clustered on household identifiers.
Source: Author's calculations based on ILO SWTS data.

Table A.8 Hazard ratios obtained from Gompertz regression with shared frailty, sons and daughters only, including direct transitions

	All regions		SSA		EECA		Asia	
Age	0.992	(0.00729)	0.967	(0.0216)	1.011	(0.0133)	0.991	(0.00961)
Male	1.242***	(0.0538)	1.210	(0.169)	1.632***	(0.124)	1.007	(0.0588)
Household size	0.995	(0.0142)	1.015	(0.0264)	1.010	(0.0334)	0.978	(0.0181)
Elementary education	1.720***	(0.266)					2.042***	(0.299)
Secondary education	1.007	(0.0549)	0.841	(0.130)	1.043	(0.114)	1.144**	(0.0783)
Tertiary education	1.384***	(0.0932)	0.775	(0.253)	1.677***	(0.169)	1.069	(0.106)
Marital status:								
engaged	0.847	(0.115)	0.754	(0.162)	0.786	(0.183)	1.294	(0.358)
married	1.004	(0.0824)	0.841	(0.221)	0.734**	(0.110)	1.085	(0.117)
divorced	0.632***	(0.0906)	0.212***	(0.112)	0.619**	(0.123)	0.830	(0.235)
widow	0.896	(0.362)	2.971	(2.810)	0.298	(0.223)	1.001	(0.484)
Children	1.008	(0.0843)	1.198	(0.238)	1.170	(0.174)	0.868	(0.102)
Subjective household wealth assessment:								
fairly well off	0.747**	(0.0947)	0.722	(0.445)	0.783	(0.122)	1.188	(0.614)
around national average	0.684***	(0.0804)	0.848	(0.503)	0.693***	(0.0984)	1.123	(0.568)
fairly poor	0.681***	(0.0842)	0.891	(0.530)	0.650***	(0.102)	1.146	(0.582)
poor	0.537***	(0.0745)	0.841	(0.509)	0.419***	(0.0791)	1.198	(0.625)
Respondents	0.983	(0.0570)	0.788**	(0.0899)	1.110	(0.125)	1.091	(0.0930)
Birth index	1.261**	(0.132)	1.513	(0.473)	1.283	(0.236)	1.109	(0.156)
Birth index same sex	0.870	(0.114)	0.838	(0.307)	0.936	(0.215)	0.845	(0.153)
Ratio of transited siblings.	0.934	(0.0576)	0.540***	(0.112)	0.973	(0.110)	1.027	(0.0782)
Siblings' length of unemployment	0.991***	(0.00238)	1.024*	(0.0137)	0.994*	(0.00316)	0.984	(0.0119)
Siblings' length of inactivity	1.002	(0.00184)	0.984**	(0.00756)	1.014***	(0.00331)	0.995**	(0.00215)
Siblings length of wage employment	0.996***	(0.00115)	0.988*	(0.00665)	0.992***	(0.00203)	0.997**	(0.00141)
Constant	0.391***	(0.121)	0.991	(0.875)	0.121***	(0.0552)	0.0854***	(0.0515)
Observations	8 703		879		4 934		2 890	
Number of groups	5 210		605		2 711		1 894	
Subjects	6 326		724		3 188		2 414	
Failures	5 067		537		2 325		2 205	
γ	0.989***	(0.00125)	0.950***	(0.00520)	0.997	(0.00192)	0.991***	(0.00180)
ln θ	0.998	(0.0438)	1.089	(0.113)	1.561***	(0.0943)	0.571***	(0.0412)

*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.9 Hazard ratios obtained from Cox regressions, all household members, including direct transitions

	All regions		SSA		EECA		Asia	
Age	1.002	(0.00323)	0.995	(0.00575)	1.029***	(0.00608)	0.984***	(0.00521)
Male	1.229***	(0.0230)	1.318***	(0.0492)	1.426***	(0.0448)	1.027	(0.0301)
Household size	0.980***	(0.00518)	0.998	(0.00670)	0.967***	(0.0125)	0.984*	(0.00873)
Elementary education	1.375***	(0.0815)					1.434***	(0.101)
Secondary education	0.979	(0.0230)	0.900***	(0.0359)	0.981	(0.0467)	1.134***	(0.0412)
Tertiary education	1.268***	(0.0371)	1.025	(0.0890)	1.372***	(0.0590)	1.185***	(0.0543)
Marital status:								
engaged	1.023	(0.0578)	1.089	(0.0665)	0.915	(0.0814)	1.339***	(0.105)
married	0.958	(0.0301)	0.981	(0.0579)	0.822***	(0.0429)	1.006	(0.0580)
divorced	1.015	(0.0589)	1.054	(0.110)	0.956	(0.0750)	0.853	(0.156)
widow	1.065	(0.152)	1.089	(0.255)	1.164	(0.349)	1.075	(0.230)
Children	0.908***	(0.0283)	1.026	(0.0548)	0.838***	(0.0430)	0.983	(0.0603)
Subjective household wealth assessment:								
fairly well off	0.942	(0.0510)	1.017	(0.159)	0.929	(0.0602)	1.128	(0.332)
around national average	0.893**	(0.0444)	1.011	(0.150)	0.876**	(0.0499)	1.135	(0.329)
fairly poor	0.885**	(0.0463)	0.962	(0.144)	0.851**	(0.0542)	1.181	(0.344)
poor	0.795***	(0.0476)	0.920	(0.140)	0.641***	(0.0554)	1.228	(0.364)
Respondents	1.101***	(0.0179)	1.011	(0.0229)	1.212***	(0.0368)	1.131***	(0.0300)
Birth index	0.772***	(0.0388)	0.821*	(0.0828)	0.740***	(0.0653)	0.859**	(0.0634)
Birth index same sex	1.403***	(0.0936)	1.324**	(0.163)	1.732***	(0.195)	1.073	(0.0989)
Ratio of transited respondents.	1.104***	(0.0280)	1.137**	(0.0570)	1.099**	(0.0519)	1.048	(0.0394)
Time-varying covariates:								
Respondents who have left school	0.784***	(0.0279)	0.422***	(0.0452)	0.863**	(0.0575)	0.956	(0.0396)
Respondents in unemployment	0.817**	(0.0655)	1.671**	(0.401)	0.751***	(0.0763)	0.467**	(0.147)
Respondents in inactivity	0.528***	(0.0241)	0.966	(0.111)	0.495***	(0.0406)	0.439***	(0.0296)
Respondents in wage employment	1.078*	(0.0432)	1.113	(0.171)	0.990	(0.0707)	0.975	(0.0441)
Observations	17 142		3 769		8 889		4 484	
Subjects	12 202		2 806		5 623		3 773	
Failures	9 320		1 981		3 906		3 433	
Clusters	9 327		2 200		4 366		2 761	

Standard errors clustered on household identifiers.
*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.10 Hazard ratios obtained from Gompertz regression with shared frailty, all household members, including direct transitions

	All regions		SSA		EECA		Asia	
Age	0.999	(0.00542)	0.973**	(0.0111)	1.037***	(0.00982)	0.976***	(0.00802)
Male	1.435***	(0.0425)	1.693***	(0.121)	1.795***	(0.0851)	1.024	(0.0462)
Household size	0.975***	(0.00889)	1.006	(0.0135)	0.969	(0.0200)	0.985	(0.0147)
Elementary education	1.636***	(0.180)					1.810***	(0.194)
Secondary education	0.987	(0.0375)	0.985	(0.0735)	0.974	(0.0727)	1.182***	(0.0648)
Tertiary education	1.509***	(0.0768)	1.093	(0.183)	1.734***	(0.122)	1.256***	(0.108)
Marital status:								
engaged	0.973	(0.0881)	1.040	(0.131)	0.830	(0.132)	1.306	(0.334)
married	0.950	(0.0509)	1.080	(0.122)	0.743***	(0.0660)	1.096	(0.0920)
divorced	0.906	(0.0934)	1.041	(0.247)	0.817	(0.114)	0.979	(0.230)
widow	0.821	(0.227)	0.442	(0.270)	0.775	(0.419)	1.201	(0.431)
Children	0.873**	(0.0461)	1.056	(0.108)	0.792***	(0.0699)	0.905	(0.0793)
Subjective household wealth assessment:								
fairly well off	0.862	(0.0777)	0.974	(0.274)	0.864	(0.0949)	1.148	(0.494)
around national average	0.783***	(0.0654)	1.021	(0.269)	0.738***	(0.0729)	1.156	(0.487)
fairly poor	0.768***	(0.0673)	0.922	(0.245)	0.699***	(0.0764)	1.232	(0.522)
poor	0.682***	(0.0662)	0.841	(0.228)	0.495***	(0.0662)	1.357	(0.590)
Respondents	1.165***	(0.0314)	0.969	(0.0432)	1.444***	(0.0725)	1.175***	(0.0536)
Birth index	0.862**	(0.0578)	0.694**	(0.115)	0.928	(0.105)	0.965	(0.0978)
Birth index same sex	1.566***	(0.143)	1.744***	(0.346)	1.979***	(0.312)	0.972	(0.138)
Ratio of transited respondents	0.897**	(0.0380)	1.034	(0.0962)	0.710***	(0.0523)	0.951	(0.0609)
Time-varying covariates:								
Respondents who have left school	0.551***	(0.0260)	0.153***	(0.0191)	0.609***	(0.0524)	0.797***	(0.0487)
Respondents in unemployment	1.047	(0.102)	4.136***	(1.309)	0.970	(0.121)	0.464*	(0.187)
Respondents in inactivity	0.545***	(0.0332)	1.395**	(0.202)	0.468***	(0.0484)	0.487***	(0.0477)
Respondents in wage employment	1.084	(0.0595)	1.188	(0.209)	0.922	(0.0856)	1.006	(0.0727)
Constant	0.193***	(0.0477)	0.590	(0.256)	0.0339***	(0.0113)	0.105***	(0.0533)
Observations	17 142		3 769		8 889		4 484	
Number of groups	9 327		2 200		4 366		2 761	
Subjects	12 202		2 806		5 623		3 773	
Failures	9 320		1 981		3 906		3 433	
γ	0.979***	(0.000822)	0.960***	(0.00221)	0.983***	(0.00128)	0.990***	(0.00121)
Ln θ	0.880***	(0.0313)	0.933	(0.0578)	1.127**	(0.0648)	0.594***	(0.0334)

*** p <0.01, ** p <0.05, * p <0.1.

Standard errors clustered on household identifiers.

Source: Author's calculations based on ILO SWTS data.

Table A.11 Subhazard ratios obtained from competing risk regression, all household members, including direct transitions

	Transitions from non-employment to wage employment							
	All regions		SSA		EECA		Asia	
Age	1.035***	(0.00438)	1.023**	(0.0102)	1.061***	(0.00706)	1.017**	(0.00713)
Male	1.141***	(0.0288)	1.205***	(0.0808)	1.267***	(0.0468)	0.974	(0.0408)
Household size	0.957***	(0.00766)	0.965***	(0.0126)	0.937***	(0.0145)	0.978*	(0.0134)
Elementary education	1.196**	(0.0947)					1.150*	(0.0934)
Secondary education	1.126***	(0.0374)	1.172**	(0.0789)	0.865***	(0.0485)	1.328***	(0.0667)
Tertiary education	1.408***	(0.0510)	1.522***	(0.189)	1.413***	(0.0676)	1.506***	(0.101)
Marital status:								
engaged	0.857**	(0.0662)	0.698***	(0.0854)	1.056	(0.106)	0.709	(0.211)
married	0.818***	(0.0351)	0.719***	(0.0784)	0.818***	(0.0502)	0.831**	(0.0628)
divorced	1.097	(0.0799)	1.168	(0.239)	1.041	(0.0951)	1.261	(0.196)
widow	1.237	(0.284)	1.401	(0.591)	1.453	(0.503)	1.138	(0.406)
Children	0.851***	(0.0362)	0.910	(0.0887)	0.850***	(0.0515)	0.899	(0.0704)
Subjective household wealth assessment:								
fairly well off	1.014	(0.0735)	0.719	(0.164)	1.011	(0.0829)	1.370	(0.634)
around national average	1.027	(0.0675)	0.812	(0.164)	1.031	(0.0751)	1.479	(0.673)
fairly poor	0.991	(0.0680)	0.624**	(0.129)	0.901	(0.0707)	1.873	(0.854)
poor	0.875*	(0.0683)	0.702*	(0.148)	0.709***	(0.0704)	1.530	(0.711)
Respondents	1.189***	(0.0255)	1.086**	(0.0392)	1.314***	(0.0497)	1.160***	(0.0471)
Birth index	0.767***	(0.0507)	0.920	(0.144)	0.838*	(0.0895)	0.701***	(0.0716)
Birth index same sex	1.440***	(0.128)	1.231	(0.246)	1.799***	(0.247)	1.243	(0.176)
Ratio of transited respondents	1.157***	(0.0399)	1.273***	(0.106)	1.088	(0.0606)	1.235***	(0.0730)
Time-varying covariates:								
Respondents who have left school	0.511***	(0.0272)	0.358***	(0.0600)	0.452***	(0.0432)	0.555***	(0.0408)
Respondents in unemployment	1.596***	(0.147)	3.187***	(1.001)	1.684***	(0.206)	1.197	(0.416)
Respondents in inactivity	0.798***	(0.0526)	1.432**	(0.250)	0.869	(0.0963)	0.638***	(0.0687)
Respondents in wage employment	2.125***	(0.123)	2.091***	(0.443)	1.976***	(0.199)	2.241***	(0.174)
Observations	23 903		5 506		10 902		7 495	
Subjects	12 415		2 870		5 749		3 796	
Failures	6 300		1 000		3 092		2 208	
Clusters	9 443		2 244		4 426		2 773	

*** p <0.01, ** p <0.05, * p <0.1.
Standard errors clustered on household identifiers.
Source: Author's calculations based on ILO SWTS data.

Table A.12 Subhazard ratios obtained from competing risk regression, all household members, including direct transitions

	Transitions from non-employment to self-employment							
	All regions		SSA		EECA		Asia	
Age	1.008	(0.00487)	1.007	(0.00822)	1.006	(0.0111)	1.012*	(0.00725)
Male	1.253***	(0.0375)	1.197***	(0.0644)	1.664***	(0.114)	1.112**	(0.0469)
Household size	1.010	(0.00706)	1.017*	(0.00948)	1.058***	(0.0228)	1.007	(0.0122)
Elementary education	1.024	(0.0712)					1.000	(0.0717)
Secondary education	0.768***	(0.0246)	0.689***	(0.0400)	1.124	(0.0871)	0.707***	(0.0341)
Tertiary education	0.450***	(0.0333)	0.363***	(0.0798)	0.500***	(0.0537)	0.416***	(0.0494)
Marital status:								
engaged	1.336***	(0.103)	1.477***	(0.129)	0.905	(0.181)	1.490	(0.387)
married	1.254***	(0.0599)	1.285***	(0.104)	0.972	(0.106)	1.314***	(0.0934)
divorced	0.952	(0.101)	0.965	(0.159)	0.886	(0.156)	0.829	(0.204)
widow	0.927	(0.216)	1.133	(0.502)	1.445	(0.827)	0.792	(0.234)
Children	1.057	(0.0475)	1.082	(0.0790)	1.081	(0.114)	1.054	(0.0734)
Subjective household wealth assessment:								
fairly well off	0.966	(0.0876)	1.395	(0.388)	0.891	(0.0982)	0.766	(0.229)
around national average	0.920	(0.0773)	1.281	(0.343)	0.921	(0.0875)	0.644	(0.187)
fairly poor	0.970	(0.0854)	1.449	(0.389)	1.205	(0.137)	0.599*	(0.175)
poor	0.961	(0.0913)	1.366	(0.369)	0.958	(0.151)	0.669	(0.202)
Respondents	1.081***	(0.0237)	0.986	(0.0322)	1.155***	(0.0598)	1.150***	(0.0424)
Birth index	0.926	(0.0648)	0.749**	(0.104)	0.865	(0.133)	1.202*	(0.115)
Birth index same sex	1.360***	(0.129)	1.600***	(0.273)	1.680***	(0.321)	1.004	(0.138)
Ratio of transited respondents.	1.119***	(0.0424)	1.168**	(0.0754)	1.210**	(0.106)	1.057	(0.0586)
Time-varying covariates:								
Respondents who have left school	1.078*	(0.0448)	0.594***	(0.0709)	1.159	(0.104)	1.141**	(0.0601)
Respondents in unemployment	0.437***	(0.0649)	0.782	(0.267)	0.371***	(0.0697)	0.612	(0.264)
Respondents in inactivity	0.347***	(0.0217)	0.698***	(0.0971)	0.321***	(0.0404)	0.290***	(0.0291)
Respondents in wage employment	0.459***	(0.0292)	0.623**	(0.125)	0.423***	(0.0513)	0.430***	(0.0345)
Observations	28 419		5 375		15 473		7 571	
Subjects	12 455		2 835		5 802		3 818	
Failures	4 574		1 310		1 175		2 089	
Clusters	9 492		2 221		4 481		2 790	

*** p <0.01, ** p <0.05, * p <0.1

Standard errors clustered on household identifiers.
Source: Author's calculations based on ILO SWTS data.

Table A.13 Hazard ratios obtained from Cox regressions, all household members, excluding direct transitions

	All regions		SSA		EECA		Asia	
Age	1.002	(0.00503)	0.984	(0.0120)	1.030	(0.00785)	0.966***	(0.00810)
Male	1.163***	(0.0340)	1.548***	(0.129)	1.302***	(0.0538)	0.889**	(0.0426)
Household size	0.951***	(0.00836)	0.962***	(0.0144)	0.902***	(0.0152)	0.995	(0.0137)
Elementary education	1.747***	(0.162)					1.656***	(0.157)
Secondary education	1.064*	(0.0396)	1.012	(0.0831)	0.954	(0.0564)	1.482***	(0.0900)
Tertiary education	1.431***	(0.0632)	1.005	(0.233)	1.463***	(0.0842)	1.283***	(0.0939)
Marital status:								
engaged	1.039	(0.0821)	1.172	(0.160)	0.901	(0.102)	1.384**	(0.215)
married	0.883***	(0.0417)	1.073	(0.126)	0.760***	(0.0528)	0.987	(0.0772)
divorced	0.994	(0.0832)	1.122	(0.251)	0.904	(0.0914)	0.857	(0.196)
widow	1.026	(0.366)	2.422***	(0.774)	0.725	(0.223)	1.390	(1.036)
Children	0.781***	(0.0361)	0.923	(0.0922)	0.772***	(0.0528)	0.859*	(0.0727)
Subjective household wealth assessment:								
fairly well off	0.873*	(0.0670)	0.923	(0.241)	0.860*	(0.0728)	1.911	(1.549)
around national average	0.840**	(0.0584)	0.814	(0.198)	0.821***	(0.0612)	2.088	(1.686)
fairly poor	0.814***	(0.0604)	0.780	(0.193)	0.790***	(0.0649)	2.047	(1.657)
poor	0.661***	(0.0568)	0.749	(0.188)	0.508***	(0.0560)	2.266	(1.849)
Respondents	1.032	(0.0230)	0.893**	(0.0417)	1.031	(0.0389)	1.102***	(0.0397)
Birth index	0.640***	(0.0452)	0.630**	(0.117)	0.519***	(0.0532)	0.918	(0.105)
Birth index same sex	1 427***	(0.136)	1.540*	(0.347)	1.783***	(0.261)	0.885	(0.139)
Ratio of transited respondents	1.189***	(0.0511)	1.429***	(0.135)	1.147**	(0.0764)	1.151*	(0.0848)
Respondents' length of unemployment	0.996***	(0.00120)	1.000	(0.00483)	0.997**	(0.00128)	0.988***	(0.00468)
Respondents' length of inactivity	0.996***	(0.000706)	0.996*	(0.00202)	0.999	(0.00109)	0.993***	(0.001000)
Respondents' length of wage employment	1.001	(0.000616)	1.001	(0.00240)	1.002**	(0.000949)	1.000	(0.000838)
Observations	9 467		1 693		5 240		2 534	
Subjects	8 032		1 531		4 460		2 041	
Failures	5 152		780		2 696		1 676	
Clusters	6 427		1 259		3 598		1 570	

*** p <0.01, ** p <0.05, * p <0.1.

Standard errors clustered on household identifiers.

Source: Author's calculations based on ILO SWTS data.

Table A.14 Hazard ratios obtained from Gompertz regression with shared frailty, all household members, excluding direct transitions

	All regions		SSA		EECA		Asia	
Age	1.009	(0.00850)	0.978	(0.0212)	1.046***	(0.0121)	0.964**	(0.0140)
Male	1.383***	(0.0587)	2.017***	(0.262)	1.522***	(0.0858)	0.957	(0.0697)
Household size	0.921***	(0.0132)	0.937***	(0.0235)	0.864***	(0.0213)	1.012	(0.0264)
Elementary education	3.594***	(0.777)					3.755***	(0.774)
Secondary education	1.094	(0.0643)	1.066	(0.141)	0.982	(0.0867)	1.672***	(0.162)
Tertiary education	1.617***	(0.114)	0.990	(0.356)	1.792***	(0.152)	1.230*	(0.151)
Marital status:								
engaged	0.968	(0.126)	1.070	(0.234)	0.799	(0.149)	1.429	(0.498)
married	0.826**	(0.0632)	1.091	(0.219)	0.687***	(0.0711)	1.019	(0.136)
divorced	0.979	(0.136)	1.394	(0.542)	0.861	(0.140)	0.959	(0.365)
widow	0.997	(0.498)	1.670	(1.565)	0.304*	(0.213)	4.309*	(3.520)
Children	0.692***	(0.0523)	0.855	(0.151)	0.673***	(0.0690)	0.753**	(0.105)
Subjective household wealth assessment:								
fairly well off	0.774**	(0.0985)	0.848	(0.385)	0.798*	(0.106)	1.532	(1.661)
around national average	0.699***	(0.0825)	0.803	(0.344)	0.700***	(0.0836)	1.723	(1.858)
fairly poor	0.667***	(0.0835)	0.759	(0.332)	0.635***	(0.0834)	1.806	(1.953)
poor	0.509***	(0.0715)	0.658	(0.291)	0.368***	(0.0595)	2.243	(2.455)
Respondents	1.017	(0.0392)	0.823**	(0.0646)	1.060	(0.0601)	1.151**	(0.0825)
Birth index	0.724***	(0.0670)	0.589**	(0.158)	0.575***	(0.0739)	1.107	(0.172)
Birth index same sex	1.242*	(0.161)	1.431	(0.457)	1.799***	(0.348)	0.720	(0.154)
Ratio of transited respondents	0.864**	(0.0564)	1.018	(0.166)	0.849*	(0.0774)	0.869	(0.102)
Respondents' length of unemployment	1.000	(0.00202)	1.001	(0.00786)	1.001	(0.00204)	0.987	(0.00837)
Respondents' length of inactivity	1.009***	(0.00122)	1.006*	(0.00383)	1.009***	(0.00154)	1.003	(0.00219)
Respondents' length of wage employment	0.996***	(0.000998)	0.994	(0.00393)	0.998	(0.00136)	0.995***	(0.00155)
Constant	0.00471***	(0.00179)	0.0226***	(0.0175)	0.0190***	(0.00760)	0.0389***	(0.0458)
Observations	9 467		1 693		5 240		2 534	
Number of groups	6 427		1 259		3 598		1 570	
Subjects	8 032		1 531		4 460		2 041	
Failures	5 152		780		2 696		1 676	
γ	1.002**	(0.000904)	1.008***	(0.00201)	0.993***	(0.00134)	1.006***	(0.00177)
ln θ	1.518***	(0.0645)	1.901***	(0.222)	1.254***	(0.0813)	1.219**	(0.113)

*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.15 Hazard ratios obtained from Cox regressions, all household members, excluding direct transitions

	All regions		SSA		EECA		Asia	
Age	0.999	(0.00490)	0.989	(0.0120)	1.029***	(0.00770)	0.958***	(0.00774)
Male	1.156***	(0.0328)	1.628***	(0.135)	1.264***	(0.0509)	0.917*	(0.0424)
Household size	0.960***	(0.00819)	0.977	(0.0144)	0.920***	(0.0153)	0.993	(0.0135)
Elementary education	1.716***	(0.150)					1.675***	(0.147)
Secondary education	1.103***	(0.0405)	0.993	(0.0858)	1.004	(0.0584)	1.538***	(0.0905)
Tertiary education	1.448***	(0.0628)	1.112	(0.238)	1.444***	(0.0813)	1.363***	(0.101)
Marital status:								
engaged	1.081	(0.0896)	1.302*	(0.180)	0.957	(0.106)	1.497***	(0.207)
married	0.946	(0.0437)	1.187	(0.143)	0.826***	(0.0556)	0.979	(0.0772)
divorced	1.056	(0.0846)	1.376*	(0.265)	0.986	(0.0948)	0.758	(0.177)
widow	0.878	(0.333)	2.709***	(0.559)	0.530	(0.256)	1.246	(0.939)
Children	0.782***	(0.0354)	0.878	(0.0891)	0.755***	(0.0502)	0.942	(0.0793)
Subjective household wealth assessment:								
fairly well off	0.927	(0.0705)	1.070	(0.323)	0.925	(0.0778)	1.276	(0.819)
around national average	0.880*	(0.0608)	0.957	(0.274)	0.868*	(0.0642)	1.363	(0.868)
fairly poor	0.878*	(0.0643)	0.947	(0.274)	0.854*	(0.0694)	1.403	(0.897)
poor	0.721***	(0.0613)	0.902	(0.265)	0.560***	(0.0605)	1.539	(0.994)
Respondents	1.223***	(0.0290)	1.004	(0.0514)	1.317***	(0.0501)	1.245***	(0.0498)
Birth index	0.774***	(0.0546)	0.674*	(0.140)	0.782**	(0.0835)	0.884	(0.0961)
Birth index same sex	1.633***	(0.153)	1.990***	(0.495)	2.011***	(0.287)	1.038	(0.156)
Ratio of transited respondents	1.200***	(0.0470)	1.529***	(0.161)	1.188***	(0.0717)	1.126*	(0.0706)
Time-varying covariates:								
Respondents who have left school	0.669***	(0.0348)	0.392***	(0.0616)	0.615***	(0.0539)	0.813***	(0.0550)
Respondents in unemployment	0.697***	(0.0674)	0.443	(0.223)	0.823	(0.0985)	0.476**	(0.167)
Respondents in inactivity	0.691***	(0.0432)	1.283	(0.222)	0.798**	(0.0834)	0.530***	(0.0463)
Respondents in wage employment	1.060	(0.0598)	1.048	(0.218)	1.135	(0.102)	0.949	(0.0710)
Observations	10 841		2 142		5 944		2 755	
Subjects	8 087		1 529		4 425		2 133	
Failures	5 275		719		2 769		1 787	
Clusters	6 514		1 271		3 582		1 661	

*** p <0.01, ** p <0.05, * p <0.1.
Standard errors clustered on household identifiers.
Source: Author's calculations based on ILO SWTS data.

Table A.16 Hazard ratios obtained from Gompertz regression with shared frailty, all household members, excluding direct transitions

	All regions		SSA		EECA		Asia	
Age	0.998	(0.00753)	0.965*	(0.0184)	1.039***	(0.0113)	0.947***	(0.0123)
Male	1.330***	(0.0533)	2.209***	(0.266)	1.441***	(0.0789)	0.948	(0.0644)
Household size	0.940***	(0.0120)	0.959*	(0.0207)	0.897***	(0.0213)	1.002	(0.0228)
Elementary education	2.911***	(0.499)					3.023***	(0.519)
Secondary education	1.176***	(0.0632)	1.154	(0.141)	1.036	(0.0866)	1.791***	(0.157)
Tertiary education	1.658***	(0.107)	1.148	(0.379)	1.782***	(0.144)	1.365***	(0.155)
Marital status:								
engaged	1.078	(0.129)	1.360	(0.276)	0.861	(0.149)	1.505	(0.492)
married	0.950	(0.0662)	1.363*	(0.241)	0.787**	(0.0775)	1.081	(0.133)
divorced	1.008	(0.126)	1.498	(0.482)	0.892	(0.137)	0.858	(0.313)
widow	0.952	(0.433)	2.407	(1.997)	0.298*	(0.198)	3.572	(2.903)
Children	0.695***	(0.0475)	0.826	(0.130)	0.673***	(0.0657)	0.816	(0.104)
Subjective household wealth assessment:								
fairly well off	0.825*	(0.0940)	0.833	(0.342)	0.841	(0.105)	0.956	(0.784)
around national average	0.761***	(0.0799)	0.835	(0.322)	0.748***	(0.0837)	1.051	(0.854)
fairly poor	0.750***	(0.0834)	0.752	(0.296)	0.711***	(0.0873)	1.158	(0.945)
poor	0.576***	(0.0721)	0.694	(0.276)	0.418***	(0.0631)	1.324	(1.098)
Respondents	1.320***	(0.0482)	1.046	(0.0787)	1.539***	(0.0880)	1.346***	(0.0901)
Birth index	0.917	(0.0848)	0.700	(0.192)	0.925	(0.123)	1.134	(0.170)
Birth index same sex	1.699***	(0.216)	1.916**	(0.631)	2.601***	(0.495)	0.891	(0.186)
Ratio of transited respondents	0.955	(0.0561)	1.457**	(0.224)	0.834**	(0.0706)	0.997	(0.101)
Time-varying covariates:								
Respondents who have left school	0.492***	(0.0314)	0.236***	(0.0415)	0.454***	(0.0476)	0.610***	(0.0564)
Respondents in unemployment	0.768**	(0.0878)	0.450	(0.256)	0.898	(0.126)	0.522	(0.222)
Respondents in inactivity	0.822**	(0.0648)	1.530**	(0.309)	0.934	(0.118)	0.672***	(0.0822)
Respondents in wage employment	1.045	(0.0747)	0.991	(0.228)	1.130	(0.125)	0.969	(0.102)
Constant	0.00263***	(0.000880)	0.0183***	(0.0126)	0.00764***	(0.00295)	0.0749***	(0.0689)
Observations	10 841		2 142		5 944		2 755	
Number of groups	6 514		1 271		3 582		1 661	
Subjects	8 087		1 529		4 425		2 133	
Failures	5 275		719		2 769		1 787	
γ	0.998***	(0.000890)	0.997*	(0.00210)	0.993***	(0.00134)	1.004**	(0.00160)
ln θ	1.023	(0.0533)	1.103	(0.161)	1.023	(0.0735)	0.860	(0.0891)

*** p <0.01, ** p <0.05, * p <0.1.
Source: Author's calculations based on ILO SWTS data.

Table A.17 Subhazard ratios obtained from competing risk regression, all household members, excluding direct transitions

	Transitions from non-employment to wage employment							
	All regions		SSA		EECA		Asia	
Age	1.041***	(0.00558)	1.040**	(0.0162)	1.064***	(0.00819)	1.016*	(0.00917)
Male	1.054	(0.0346)	1.084	(0.117)	1.157***	(0.0509)	0.929	(0.0509)
Household size	0.938***	(0.00975)	0.947***	(0.0184)	0.908***	(0.0165)	0.963**	(0.0168)
Elementary education	1.119	(0.101)					1.066	(0.102)
Secondary education	1.062	(0.0446)	0.955	(0.105)	0.867**	(0.0547)	1.431***	(0.0938)
Tertiary education	1.473***	(0.0730)	1.364	(0.401)	1.309***	(0.0772)	1.922***	(0.186)
Marital status:								
engaged	0.923	(0.0916)	0.755	(0.141)	1.098	(0.131)	0.577	(0.228)
married	0.774***	(0.0432)	0.673**	(0.118)	0.817***	(0.0601)	0.737***	(0.0711)
divorced	1.048	(0.0974)	1.093	(0.307)	1.063	(0.114)	1.118	(0.222)
widow	0.892	(0.312)	2.381*	(1.206)	0.764	(0.440)	0.665	(0.422)
Children	0.814***	(0.0449)	0.846	(0.125)	0.777***	(0.0565)	0.910	(0.0911)
Subjective household wealth assessment:								
fairly well off	1.095	(0.104)	0.706	(0.277)	1.080	(0.107)	1.363	(1.056)
around national average	1.158*	(0.0994)	0.855	(0.305)	1.156*	(0.102)	1.591	(1.219)
fairly poor	1.216**	(0.109)	0.607	(0.222)	1.076	(0.102)	2.441	(1.875)
poor	0.991	(0.100)	0.718	(0.265)	0.778**	(0.0915)	1.880	(1.459)
Respondents	1.275***	(0.0352)	1.169***	(0.0649)	1.411***	(0.0597)	1.195***	(0.0627)
Birth index	0.821**	(0.0678)	0.797	(0.207)	1.001	(0.119)	0.723**	(0.0953)
Birth index same sex	1.563***	(0.178)	1.536	(0.491)	1.870***	(0.300)	1.317	(0.258)
Ratio of transited respondents	1.257***	(0.0566)	1.496***	(0.204)	1.181**	(0.0763)	1.405***	(0.110)
Time-varying covariates:								
Respondents who have left school	0.409***	(0.0263)	0.300***	(0.0684)	0.352***	(0.0377)	0.456***	(0.0421)
Respondents in unemployment	1.364***	(0.144)	1.211	(0.596)	1.514***	(0.201)	1.230	(0.435)
Respondents in inactivity	1.148*	(0.0906)	2.047***	(0.496)	1.264*	(0.160)	1.002	(0.119)
Respondents in wage employment	2.058***	(0.145)	1.885**	(0.541)	1.947***	(0.216)	2.196***	(0.221)
Observations	16 952		3 758		7 812		5 382	
Subjects	10 160		2 269		4 919		2 972	
Failures	4 291		462		2 362		1 467	
Clusters	8 017		1 839		3 896		2 282	

*** p <0.01, ** p <0.05, * p <0.1.
Standard errors clustered on household identifiers.
Source: Author's calculations based on ILO SWTS data.

This report explores the degree to which young people's labour market and schooling outcomes are affected by those of their siblings. Based on School-to-work Transitions Surveys (SWTS) from Eastern Europe and Central Asia, Sub-Saharan Africa, South and South-East Asia, the report studies the links between different household members' transitions to the labour market using alternatively logistic regression and a survival analysis framework. The analysis finds that having older siblings positively influences the probability of finding employment, at least where same sex siblings are considered.

The SWTS are made available through the ILO "Work4Youth" (W4Y) Project. This Project is a five-year partnership between the ILO and The MasterCard Foundation that aims to promote decent work opportunities for young men and women through knowledge and action. The SWTS is a unique survey instrument that generates relevant labour market information on young people aged 15 to 29 years. The survey captures longitudinal information on transitions within the labour market, thus providing evidence of the increasingly tentative and indirect paths to decent and productive employment that today's young men and women face.

The W4Y Publication Series covers national reports, with main survey findings and details on current national policy interventions in the area of youth employment, regional synthesis reports that highlight regional patterns in youth labour market transitions and thematic explorations of the datasets.

Work4Youth

For more information, visit our website: www.ilo.org/w4y
Youth Employment Programme
4 route des Morillons
CH-1211 Genève 22
Switzerland
youth@ilo.org

ISSN 2309-6780