Final Report

Intergenerational correlation of labour market outcomes

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0. Executive Summary

The potential correlation between parents' and children's labour market and other outcomes has been discussed in recent years, and concerns have been raised regarding children growing up in long-term jobless families. This report focuses on the correlation of labour market outcomes of parents and children and investigates whether education is a major factor in this correlation.

Although there have been a substantial number of international studies on the intergenerational correlation of unemployment and income support payments, the topic has been much less researched in Australia, mostly due to a lack of data. The overseas literature indicates that there are clear correlations between parents' and children's labour market and education outcomes in a wide range of countries.

0.1 Data

Based on the Household, Income and Labour Dynamics in Australia (HILDA) data, this report seeks to start filling this gap. The main analyses in this report focus on the general population. The general sample of analysis is restricted to wave five respondents between 25 and 54 years old, since the parental education questions were not asked in the previous waves. The general sample of analysis consists of 2,652 men and 3,084 women.

The first central variable, on which the analyses in this report are based, is the proportion of time unemployed since completing full-time education. This is calculated as the ratio of the time spent unemployed (in years) since completing full-time education to the total time (in years) since completing full-time education. The second central variable in this report is the proportion of time not in work over the available waves of the HILDA. It includes, for example, time spent at home looking after the children.

There are a few important retrospective variables collected in the HILDA survey enabling us to investigate the intergenerational correlation between the labour market and education outcomes of parents and their children. First, information on the parents' labour force status and occupation when the respondent was 14 is reported. In addition, the survey collects information on the presence of unemployment spells (which when put together were longer than six months in total) for the father during the period the respondent was growing up. Second, in wave five, information on the education level of the respondent's parents is reported.

Analyses of a subsample of young respondents, who were still living with their parents and under 18 when they were first observed in the survey, complement the main analyses. For those respondents still living at home with their parents, we potentially have much more information on their parents than we have for the general population. This allows us to include additional control variables in the multivariate analysis. The initial sample of youths is further restricted for the purpose of the multivariate analyses to wave four respondents because this is the only wave for which information about high school achievement and attitude toward career development was recorded. The youth sample for which the multivariate analyses are carried out contains slightly over 900 men and women.

0.2 Methodology

Following some of the more recent international studies, the analysis accounts for the simultaneous correlation of the respondent's and parental education, and the respondent's and the parents' labour market outcomes. In addition, the parents' labour market outcomes are allowed to affect the respondent's labour market outcomes indirectly through education.

The model used to investigate the intergenerational correlation of labour market outcomes consists of a system of two equations. One equation explains the proportion of time unemployed (or not in work) and the other equation explains the attained education level[1]; both equations are estimated simultaneously. The model allows for the endogeneity of education of the respondent, given that education is likely to be to some extent determined by the same observed and unobserved factors as later labour market outcomes.[2] Ignoring this endogeneity could lead to overestimating the effect of education on labour market outcomes. The parents' education and number of siblings provide appropriate instruments for the education level of the respondent because they affect the education level of the children but do not have a direct significant effect on the children's labour market outcomes in adulthood. In addition, the unobserved factors in the two equations are allowed to be correlated.

Two separate models are estimated using the youth sample. One model aims to explain self-assessed overall achievements of youth in their last or most recent year at high school. The other model focuses on attitudes toward career development at age 35.[3]

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[1] The first equation uses a Tobit specification and the second equation uses an ordered Probit specification.
[2] Education is endogenous to labour market outcome if similar unobserved factors affect both education and labour market outcome, leading to superfluous correlation.
[3] Both models use an ordered probit approach in the estimation.

0.3 Main findings

The descriptive analyses based on the data, using simple cross tabulations, all show that there is a relationship between the education and labour market outcomes of individuals with the education and labour market outcomes of their parents. The relationship between parental labour market outcomes and time not in work is only significant for women. Only the father's labour market outcomes are significantly related to the time in unemployment of their sons and daughters. Cross tabulations based on the youth sample show a clear correlation between the parents' and the child's education. For example, children whose parents have a university degree are much less likely to drop out of school before Year 12.

The main findings of the multivariate analyses, based on the general sample, show that the labour market outcomes of men are affected by the labour market outcomes of their father. Even after controlling for education and other individual characteristics, there is a positive intergenerational correlation of labour market outcomes. This conclusion holds for the proportion of time spent unemployed and for the proportion of time spent not in work by the respondents.

The results do not show any significant intergenerational correlation of labour market outcomes when it comes to the proportion of time unemployed for women. However, there is a significant relationship between the labour market outcomes of the mother and the proportion of time spent out of work by her daughter.

The results also show a significant intergenerational relationship between parents' and children's education levels, indicating that there is a direct effect of parents' labour market outcomes on their children's labour market outcomes but also an indirect effect through education.

In addition, the presence of the mother in the household when the respondents were 14 has a significant and positive effect on the education level of both men and women. The analysis reveals a positive and significant effect of education on good labour market outcomes (through a reduction in the proportion of time in unemployment and not in work).

Finally, the analysis fails to show any significant correlation between the unobserved determinants of education and the unobserved determinants of labour market outcomes. This result suggests that the unobserved determinants of education and those of labour market outcomes are different.

The multivariate analyses based on the youth sample suggest that high school achievements are not affected by the parents' labour market outcomes. However, the results show that parental education affected the high school achievements of their children. Men do better at high school if their father has a diploma or a university degree but they are not affected by their mother's education. In contrast, there is a positive effect of both parents' education levels on women's achievements at high school.

The attitude of youth toward future career development was found to be difficult to explain. The only significant result emerging from the multivariate analysis suggests that youth tend to attach a lower importance to having a successful career later in life if their mother spent more time not in work over the recent years.

1. Introduction

The Welfare to Work reforms were partly introduced in recognition that participation in paid work provides parents and their children with long-term benefits and increased opportunities, such as increased financial security for individuals and their families. It is thought that children are better off (with regard to a range of outcomes, including for example education, mental health, juvenile delinquency) if at least one of their parents participates in the paid workforce and if the household receives less income support, especially when this is compared to the alternative of household joblessness and full income support dependence. In addition to being financially better off, it is often said that parents in paid employment provide positive role models for their children. The potential correlation between parents' and children's labour market and other outcomes has been discussed in recent years and concerns have been raised regarding children growing up in long-term jobless families. This report focuses on the correlation of labour market outcomes of parents and children and investigates whether education is a major factor in this correlation. Unfortunately, data on whether the household in which the respondent lived in childhood was a jobless household for a substantial proportion of time is scarce.

Although there have been a number of international studies on the intergenerational correlation of unemployment and income support payments, the topic has been much less researched in Australia, mostly due to a lack of data. This report seeks to start filling this gap by exploring the extent of intergenerational correlation with regard to labour market outcomes. That is, is an individual's labour market status influenced by their parents' labour market status? For example, is there any evidence that unemployment is transferred from one generation to the next? Based on the Household, Income and Labour Dynamics in Australia (HILDA) data, Headey, Warren and Harding (2006: p.81) presented results from an analysis of the effect of the father's unemployment when the respondent was aged 14 on the percentage of time a respondent was out of paid employment since leaving full-time education. Similar to what is found by other studies (to be discussed in Section 2), the results indicate that there are correlations between parents' and children's labour market and education outcomes in Australia. Also using the HILDA data, this report aims to broaden and deepen this type of bivariate analysis (based on cross tabulations) following some of the more recent international studies. The analysis is broadened by accounting for the simultaneous correlation of the respondent's and parental education, and for the direct effect education may have on labour market outcomes, allowing for endogeneity of education. A deeper analysis is

achieved by using multivariate analysis in order to control for a range of important factors affecting labour market outcomes, in addition to intergenerational correlation of outcomes.

The project seeks to examine whether the results on correlation of labour market outcomes are sensitive to the assumption of exogenous education. That is, could education be determined by similar factors as labour market status, thereby overstating the effect of education on labour market status and understating the total effect of parents' labour market status? The parents' labour market status may have a direct and an indirect effect (through education) on the child's labour market status.

The main analyses focus on the general population. However, for those respondents still living at home with their parents we potentially have much more information on their parents than we have for the general population. This potentially provides us with additional control variables in the multivariate analysis. A disadvantage of using this subsample is the issue of selection. Respondents who live with their parents are likely to be different in important ways (for example, have no job) from those who live independently. The issue of selection is likely to be much less relevant for respondents under 20 (or 18) years of age, where the majority of respondents would still live with their parents. This group is selected in the first wave in which they are observed, and followed through time (potentially after leaving the parental home). This is possible since each respondent in HILDA is followed through time even if they leave the household in which they are first observed. The analysis of this group of young respondents complements the main analysis.

The report is structured in the following way. Section 2 provides a brief review of the approaches used in the international and Australian literature and the results found. The data is described separately for the general sample and for the youth sample in Section 3. The summary statistics for the general population are reported in Section 4, and the multivariate regression analyses are discussed in Section 5. The second set of analyses focussing on the youth sample is reported in Section 6, with the summary statistics in the first subsection and the multivariate regression analysis in the second subsection. Section 7 concludes.

2. Background literature on intergenerational correlation

In an overview for OECD countries, d'Addio (2007) looks at the following issues in relation to intergenerational correlation: child development and intergenerational mobility, intergenerational income mobility, and intergenerational mobility in education, occupation and personality traits.

Summarising her review, she indicates that intergenerational earnings mobility varies significantly across countries, being higher in the Nordic countries, Canada and Australia but lower in Italy, the United States and the United Kingdom. Individual and household characteristics are important, as is the starting point in the income distribution, with mobility being lower at both the top and the bottom of the distribution in many countries. Finally, countries where both income inequality and rewards to education are higher, display lower intergenerational earnings mobility and the degree of persistence of family income across generations is stronger than that of earnings alone.

She mentions education as a major contributor to intergenerational income mobility, with educational differences tending to persist across generations. In addition to a range of family characteristics that shape educational mobility across generations, policies play a role in some of the cross-country differences in the extent of intergenerational mobility of education. An interesting example is that early streaming of students, based on their ability, seems to reduce mobility across generations considerably.

Evidence of intergenerational immobility extends to other outcomes, such as occupation, wealth, welfare receipt (apparently influenced by specific aspects of programme design), and personality traits (affecting both labour market outcomes and family formation).

d'Addio (2007: p. 70) concludes with the following statement: "One of the main objectives of social policy is to break the cycle of disadvantage across generations and prevent the development of a self-replicating underclass. […] The evidence suggests that interventions targeted at improving childhood outcomes are desirable. […] Childhood poverty is in fact a route through which disadvantage is transmitted between generations, so tackling it needs to be a priority. Doing so by helping parents work can be more effective than by giving them cash transfers, as this may contribute to change attitudes or behaviours."

After a brief discussion of Australian evidence on intergenerational correlation in Section 2.1, the remainder of this section is structured to correspond to a number of the different types of intergenerational correlation discussed in d'Addio (2007). Section 2.2 discusses a number of studies related to the intergenerational correlation of labour market outcomes, followed by the intergenerational correlation of welfare participation in Section 2.3 and the intergenerational correlation of income and earnings in Section 2.4. Education mobility across generations is described in Section 2.5. After reporting on the transfer of economic status in Section 2.6, the final subsection concludes and identifies the contribution of this report.

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2.1 Australian evidence

Pech and McCoull (1998) review the US evidence and report Australian evidence from the Australian Bureau of Statistics regarding the unemployment of young people living with their parents. There is a correlation between the parents' unemployment and their child's unemployment. The fact that the sample only contains young people living with their parents may give rise to some selectivity issues. However, a similar finding was made using the Survey of Employment and Unemployment Patterns where all young people are included in the analysis. Further, the Negotiating the Life Course data set shows some correlation between parents' and children's educational attainment and employment experiences.

In a follow-up to their previous article, Pech and McCoull (2000) carry out an analysis based on descriptive statistics based on an administrative dataset on income support and Family Allowance which they constructed by selecting all young people and their parents who were recorded in the Family Allowance database and who turned 16 in the first quarter of 1996. This covers 85 per cent of the Australian population; only the richest 15 per cent are excluded. Income support receipt of these children and their parents was recorded for a period of three years.

They found that even amongst the youth whose parents were the most disadvantaged and most income support dependent, a minority of 1 out of 6 were highly income support dependent themselves when they were between 16 and 18 years old. Notwithstanding the relatively small correlation between parents and their children, this proportion is clearly higher than for the average youth in this sample. They found that young individuals from income-support-dependent families were more likely to be early school leavers, be unemployed, be long-term unemployed, have children before age 19, be income support recipients and be categorised as homeless. Except for teenage motherhood, the probabilities of these events were found to increase with the degree of income dependency.

More recently, based on HILDA data, Headey, Warren and Harding (2006: p.81) presented some results based on a cross tabulation and a simple regression analysis of the effect of the father's unemployment when the respondent was aged 14 on the percentage of time a respondent has been out of paid employment since leaving full-time education. The above studies indicate that there are correlations between parents' and children's labour market and education outcomes in Australia. These three Australian studies are based on bivariate analyses, with the first study focusing on children still living with their parents, which is a limited group in the Australian population. This project aims to broaden and deepen this type

of analysis following some of the more recent international studies (including one Australian article), which are discussed in the remainder of this section.

Related to the issue of intergenerational correlation of labour market outcomes is the intergenerational mobility of earnings. A multivariate analysis of the intergenerational mobility of earnings for Australia is reported in Leigh (2007). Based on wave four of the HILDA data, earnings elasticities are estimated after imputing the fathers' earnings based on detailed occupational information for each of the four years of data and controlling for age by including age and age squared. Predicted earnings at age 40 are used for the fathers. Several robustness checks are carried out as well as a comparison with results for US data using the approach chosen by Leigh with approaches based on better-quality data. From this, Leigh concludes that the intergenerational earnings elasticity is between 0.2 and 0.3 for Australia, without major (discernable) changes in the elasticity over time.

2.2 Intergenerational correlation of labour market outcomes

In the UK, O'Neill and Sweetman (1998) analyse the unemployment patterns of male respondents and their fathers. First, they treat the fathers' unemployment as exogenous, estimating one equation. Then they allow the fathers' employment to be endogenous, estimating separate equations for the fathers' and sons' unemployment patterns. Similar to other studies (and to the study proposed here) on this topic, the information on the parents' characteristics is limited. They find that the effect of the father's unemployment operates mostly through an increased incidence of the son's unemployment, rather than through an increase in the duration of unemployment. Allowing the father's employment to be endogenous resulted in an insignificant and small correlation between the unobserved factors in the son's and father's unemployment equation and in an insignificant effect of the father's unemployment in the son's unemployment equation. The authors suggest this may be due to the difficulty of finding sensible exclusion restrictions.

Farré and Vella (2007) analyse intergenerational correlation of social norms with regard to working women in the US and the resulting effect on female labour force participation. They use simple regressions to estimate the relationship between the mother's gender role attitudes and her children's gender role attitudes, followed by a two-Stage Least Squares estimate where the mother's earlier attitude indices are employed as instruments for her later attitude index. Both approaches show that a mother's attitude towards working women has a statistically significant effect on her children's attitudes. In further analysis, they find that the component of this social norm that is correlated with the mother's work behaviour during her

child's youth not only affects the labour force participation decision of her daughters, but also that of the wives of her sons. The findings indicate that transmission of social norms contributes to the intergenerational correlation of work behaviour of females.

2.3 Intergenerational correlation of welfare participation

In New Zealand, Pacheco and Maloney (2003) and Maloney, Maani and Pacheco (2003) analysed the intergenerational welfare participation, allowing the parents' welfare participation to influence the child's welfare participation directly and through educational attainment. However, their model does not allow for correlation of the unobserved factors in the education and the welfare participation equation. The data set used in these two New Zealand studies focuses on young adults born in 1977 in Christchurch. The authors conclude that there is correlation between parents' and children's welfare participation. Using an instrumental variables approach to find a lower and an upper bound for the correlation, they estimate the correlation to be in between one third and two thirds in size, with about one quarter due to lower education levels for children whose parents participated in welfare. Pacheco and Maloney (2003) analyse similar results by gender. They found that the correlation appears about double the size for women compared to men. This is due to both the direct effect and the indirect effect through education being larger. Female educational attainment is particularly negatively affected by parents' welfare participation and family size.

In the US, Pepper (2000) uses treatment effect methodology to estimate the effect of a parent's receipt of Aid to Families with Dependent Children (AFDC) payment on the probability of the daughter also receiving AFDC. He addresses the selection problem of only observing children in one state (their parents either received AFDC or they did not receive AFDC) in several different ways. Under some assumptions, his results confirm the evidence that AFDC receipt in the household in which the child grows up, increases the probability and the expected duration of future AFDC receipt by this child. However, without any assumptions the effect could be either positive or negative. The assumptions that lead to a (more) positive correlation in the welfare dependency of parents and children are: (i) exogenous selection, that is there are no unobserved factors leading to both the parents' and the daughters' welfare participation; (ii) ordered outcomes, that is if the duration of the parents' welfare participation during a daughter's childhood increases then the duration of the daughter's welfare participation should also increase or remain the same; (iii) use local unemployment rates faced by parents to explain their welfare participation, but assume it does not affect their daughter's welfare participation later in life; or combine the different

assumptions. Assumptions (i) and (ii) have the largest positive effect on the estimated bounds for correlation between children's and parents' outcomes, but they are also stronger assumptions, which appear less plausible.

Gottschalk (1992) also investigates the intergenerational correlation of welfare participation of mothers and daughters in the US. He uses the full available information on welfare participation spells of mother and daughter. He explicitly controls for eligibility by only selecting families who were eligible at some point in time in the observation period. Thus, the effect of participation per se can be revealed rather than, for example, high income causing the observed correlation through ineligibility. In addition, he controls for income levels by including income as a separate explanatory variable in the analysis. A competing risk duration model is estimated for the time until (i) the daughter has a child and receives (AFDC) in the first year after childbirth, (ii) the daughter has a child but receives no AFDC in the first year after childbirth or (iii) the observation period ends without having had a child. The first two outcomes represent two alternative exits (or competing risks) of the spell under analysis.

Gottschalk finds that participation in welfare by the parent(s) increases the probability of the daughter having a child early and participating in welfare herself. However, the positive effect from non-participation is partly offset by the negative effect arising from the lower family income due to non-participation. In a simulation, for whites, about 40 per cent of the effect arising from non-participation is offset by the reduction in family income, whereas for blacks and Hispanics the offsetting effect is much smaller and the effect of non-participation is much larger than for whites.

Beaulieu *et al.* (2005) consider the intergenerational correlation of welfare participation of young Canadians. Two sources of intergenerational transmission are taken into account: one that is due to a possible causal link between parents' and children's participation, and one that is due to a correlation between individual- and environment-specific characteristics across generations. Quebec government's administrative records, covering young people who were 18 years old in 1990 and whose parents were recipients of social assistance during at least one month between 1979 and 1990 are used. These data contain a limited number of individual and household characteristics. Due to data limitations, a reduced form econometric specification is used. They estimate parents' and children's participation in social assistance simultaneously using monthly information in a repeated-observations bivariate Probit specification, accounting for unobserved heterogeneity which includes family-specific fixed effects and is correlated between the parent and child equation. In addition, they control for

only including parents who spent at least one month on Social Assistance in the analysis by estimating a truncated bivariate Probit.

Beaulieu *et al.* show that, on average, a one-percentage unit increase in parental participation during the youth's pre-adult years (age 7 to 17) raises the youth' participation rate by 0.29 percentage point during early adulthood (age 18 to 21). They find that this impact is strongest during the early stages of childhood (age 7 to 9) and during late adolescence (age 16 to 17).

2.4 Intergenerational correlation of incomes and earnings

Corak (2006) compares generational mobility of earnings across a large number of countries. For the selected countries, he chooses preferred estimates of earnings elasticities between fathers and sons on the basis of comparability, such as ages of fathers and sons at the time of measurement and the number of years across which earnings are averaged. If possible and needed, he corrects elasticities to be in line with the preferred estimates, using the estimated parameters of a regression of elasticities on the characteristics of the corresponding study to predict what the reported elasticity would have been had the study been comparable to a benchmark study. Corak concludes that in all countries considered there is a relationship between parents' and children's earnings. The UK, the US and France appear to be the least mobile, where 40 to 50 per cent of the advantage of high-income young adults is associated with high earnings of the parents. At the other end of the range, in the most mobile countries Canada, Finland, Norway and Denmark only about 20 per cent of the advantage of high-income young adults is associated with high earnings of the parents. Sweden and Germany are in the middle of the range, where about 30 per cent of the advantage of high-income young adults is associated with high earnings of the parents.

In addition to the mobility of earnings, Peters (1992) also investigated the mobility of total income in the US. She uses a single equation to estimate the relationship between parents' and children's earnings and incomes. Peters found that about 10 per cent of the child's variation in the logarithm of income is explained by the parents' logarithm of income, and this is less for earnings. This indicates that parents' incomes and earnings have a limited influence on their children's incomes and earnings: income mobility is quite high. More of the daughters' variations in income are explained than for the sons, and less of the daughters' variations in earnings are explained than for the sons. Peters suggests this may be due to women's earnings being a smaller proportion of overall household income than men's earnings. Women tend to respond to their partner's income, changing their labour supply and as a result their earnings, reducing their earnings mobility.

Extending the simple equation, including parents' income or earnings only, to include a range of family background dummy variables and interactions of income or earnings with these family background dummy variables, Peters found that these interactions are important. This indicates that the effect of parents' income can be different for different types of family. For example, being non-white reduced the effect of the parents' income on the daughter's income, although for sons, it reduced the sons' income across the board independent of the parents' income.

A new contribution made by Blanden, Gregg and Macmillan (2007), who examine the intergenerational correlation of income of sons in the UK, is the consideration of non-cognitive skills as an intergenerational transmission mechanism. They analyse the factors that lead to intergenerational persistence among sons, where this is measured as the association between childhood family income and later adult earnings. They decompose the simple correlation between children's and parents' income into components related to cognitive ability, education, non-cognitive skills and labour market attachment which are all affected by parental income, and in unexplained persistence. Separate equations are estimated for each of the components, indicating the dependence of each component on parental earnings. These results are combined with the results from an equation explaining the child's earnings using cognitive ability, education, non-cognitive skills and labour market attachment to compute a decomposition of the effect of the parents' income.

Blanden, Gregg and Macmillan find that changes in the relationships between these variables, parental income and earnings are able to explain over 80 per cent of the rise in intergenerational persistence across the cohorts from 1958 to 1970. Intergenerational correlation increases from an elasticity of 0.205 to 0.291, an increase of 0.086. Of this, over 80 per cent can be explained by their model (the part that is accounted for has increased by 0.07). The largest contributors to this increase are identified to be an increasingly unequal educational attainment at age 16 and access to higher education. Noncognitive traits affect intergenerational persistence through their impact on educational attainments. Cognitive ability makes no substantive contribution to the change in mobility.

Ermisch, Francesconi and Siedler (2006) examine the intergenerational correlation of income, directly and through the spouse in the UK and Germany. They estimate the extent of intergenerational economic mobility in a framework that highlights the role played by assortative mating. Two equations are estimated: one for the child's income and one for the income of the child's partner. The child's family income in childhood is an explanatory

variable in both equations. They find that assortative mating plays an important role. On average about 40 to 50 per cent of the covariance between the parents' and the child's own permanent family income can be attributed to the person to whom one is married. This effect is driven by strong spouse correlations in human capital, which are larger in Germany than Britain.

Similar to Ermisch, Francesconi and Siedler (2006), Raaum *et al.* (2007) study the intergenerational correlation of earnings by gender, directly and through the spouse in Denmark, Finland, Norway, the UK and the US. They present comparable evidence on intergenerational earnings mobility with a focus on the role of gender and marital status. They discuss the role of own wage and cross wage elasticities on labour supply in the intergenerational earnings elasticities. With marital sorting, the effect of parental earnings on the daughter's wage (or elasticity) is lowered by (the absolute value of) the cross elasticity of women's labour supply with respect to her husband's wage. When women from high-income families also marry partners with high wages, their own hours of work will be reduced. This result illustrates that assortative mating and family labour supply decisions affect the intergenerational persistence of earnings. While labour supply responses to own wages will boost the intergenerational elasticity, assortative mating and cross labour supply responses will tend to moderate individual earnings persistence across generations.

Raaum *et al.* confirm that earnings mobility in the Nordic countries is typically greater than in the US and in the UK, but find that for married women, mobility is approximately the same across countries when estimates are based on women's own earnings. When using children's total family earnings, the estimates of intergenerational mobility in the Nordic countries exceed those for the US and the UK, for both men and women, single and married. Unlike in the Nordic countries, they find that married women with children and with husbands from affluent backgrounds tend to reduce their labour supply in the US and the UK. In the latter two countries, it is the combination of assortative mating and labour supply responses which weakens the association between married women's own earnings and their parents' earnings.

2.5 Intergenerational correlation of education

The intergenerational correlation of educational attainment in Germany is studied in Heineck and Riphahn (2007). They report that although the German education system underwent numerous reforms in order to improve "equality of opportunity" over the last decades, internationally comparative evidence shows that Germany has particularly low intergenerational mobility with respect to educational attainment.

Their study investigates the development in intergenerational education mobility for the birth cohorts 1929 through 1978 and tests whether the impact of parental background on child educational outcomes has changed over time. The categorical outcomes for their education variable are missing, basic, middle, or advanced school degree. Using cross-sectional data, they estimate a multinomial Logit model, allowing for differences in each covariate's marginal effect across categories. Their model describes the correlation with the child's education outcome of: birth cohort; parental education; child's gender; number of siblings; rural origin; federal state; birth cohort interactions with parental education, the number of siblings, gender and the rural origin indicator; and cohort size. They also investigate whether the impact of parental education on child educational outcomes differs depending on which of the two parents is considered and on whether the effect is measured for a son or a daughter.

They find positive correlations of the probability of an advanced schooling degree with being male, having highly educated parents, few siblings, and growing up in a non-rural area. Over the last birth cohorts, the probability of attaining advanced schooling degrees increased significantly only for children of highly educated parents, and for sons. Parental, in particular maternal education, affects daughters' educational outcomes more than sons' outcomes. In spite of massive public policy interventions and education reforms in Germany, Heineck and Riphahn's results indicate no significant reduction in the role of parental background for child outcomes over the last decades.

Carneiro, Meghir, and Parey (2007) focus on the intergenerational correlation of maternal educational attainment and children's outcomes and behaviour in the US. They assume that child outcomes, such as children's cognitive achievement, behavioural problems, grade repetition and obesity, are determined by the mother's years of schooling, as well as by observable and unobservable factors. Endogeneity of maternal schooling is addressed by instrumenting with variation in schooling costs when the mother grew up. That is, mothers' schooling is determined by the same factors as children's outcomes, and by a set of instruments that reflect the measured direct and indirect costs of schooling, such as tuition fees of public colleges, distance to school and foregone earnings. They also allow the coefficient on maternal schooling to depend on observable characteristics to allow for different effects of maternal schooling in different family types. They define four groups depending on the child's gender and on whether the mother has high or low ability.

They find substantial intergenerational returns to education. For children aged 7 to 8, for example, their Instrumental Variable results indicate that an additional year of mother's

schooling increases the child's performance on a standardized math test by almost 0.1 of a standard deviation, and reduces the incidence of behavioural problems. They find that income effects, delayed childbearing, and assortative mating arising from the additional schooling are likely to be important ways in which the additional schooling affects the children's outcomes, and show that maternal education leads to substantial differences in maternal labour supply.

Casey and Dustmann (2007) analyse the intergenerational correlation of economic outcomes through language skills of immigrants in Germany. They argue that language is often cited as the principal initial barrier confronting recent immigrants. According to the authors, there are reasons to believe that language proficiency of second-generation immigrants is related to the language proficiency of their parents. Children of immigrants may experience a monolingual environment in the home country language in the parental home. Given that languages are learnt more easily at very young ages, parental proficiency during the child's formative years may be a critical determinant of the child's host-country language fluency level. They hypothesise that lack of exposure to a correct form of the host country language at early stages of the child's life may have long-term consequences, affecting the child's education accumulation of human capital and labour market opportunities.

Using a simple regression approach, the paper investigates the effect deficiencies in language proficiency of second-generation immigrants have on their economic outcomes (such as earnings, labour force participation, employment and unemployment), and how this relates to the language proficiency of their parents. The analysis distinguishes between males and females, and the children of immigrants who are born in the host country and those who are born abroad, but arrived in the host country before the age of ten. The results show a significant and sizeable association between parental language fluency and that of their children, conditional on parental and family characteristics. Language deficiencies of the children of immigrants are associated with poorer labour market outcomes for females, but not for males.

2.6 Intergenerational correlation of economic status

Björklund, Jäntti and Solon (2007) examine the intergenerational correlation of socioeconomic status in Sweden, decomposed into the effect of childhood environment and inherited characteristics. They assume children's outcomes depend on the biological parents' outcomes and on the rearing parents' outcomes (who could be the same persons as the biological parents). The separate effects of childhood environment and inherited characteristics are identified through observations on a range of family types, including those

with stepparents. Estimated by family type first and then fitted to a general model by taking the first-stage coefficient estimates as the data, minimum distance methods are used to fit the parameters from a generalized version of the model to the data on the coefficients from the simple regressions. The generalization of the model is needed to deal with the complications that some children are raised by only one parent and some experience changes of rearing parents during the course of their childhood. For example, in a family with a biological mother and a stepfather, the coefficient for the biological father in the first-stage model represents a pre-birth effect and a post-birth effect and the coefficient for the stepfather represents a post-birth effect only. The fathers' and mothers' pre-birth and post-birth effects are assumed to be the same over family types, but when a father or mother is not always present in all the observation periods the post-birth effect is allowed to be different by family type and by whether they are the rearing or the biological parent. The authors argue that if the model delivers a reasonable approximation to the intergenerational associations observed, then the estimated parameters of the simplistic general model may serve as useful statistics for summarising the pre- and post-birth components of intergenerational status transmission.

Merging data from administrative sources and censuses, they investigate the association between sons' and daughters' socioeconomic outcomes and those of their biological and rearing parents. Their analysis focuses on children raised in six different family circumstances: raised by both biological parents, raised by the biological mother without a stepfather, raised by the biological mother with a stepfather, raised by the biological father without a stepmother, raised by the biological father with a stepmother, and raised by two adoptive parents. The crucial feature of their data set is that it contains information on the biological parents even when they are not the rearing parents. Their results suggest substantial roles for both pre-birth and post-birth factors.

The intergenerational correlation of economic status through intergenerational correlation in health is studied by Currie and Moretti (2007) in the US. They ask whether intergenerational correlations in health contribute to the perpetuation of economic status. They use birth weight data as a proxy of health and regress the child's birth weight on the mother's birth weight, including a range of control variables. They allow for different types of relationships between the mother's and child's birth weight, linear and nonlinear (alternatively using an indicator variable for low birth weight and using the logarithm of birth weight). They find that if a mother was low birth weight, her child is significantly more likely to be low birth weight (that is, 50 per cent more likely), even if the comparison is based on mothers who are sisters. The

intergenerational transmission of low birth weight is stronger for mothers in high poverty regions and low birth weight affects proxies for future poverty, income, and education, in particular for women born in high poverty regions.

2.7 The contribution of this report

The overall conclusion from the above studies is that there appears to be intergenerational correlation across a range of different outcomes (such as labour market outcomes, welfare participation, income or earnings, education and economic status), which is to some extent often reduced after controlling for a range of factors such as endogeneity of the parents' and children's outcomes. Although part of the correlation is through inherited characteristics, several studies find environmental characteristics affect intergenerational correlation, thus providing scope for policy interventions.

Some of the outcomes are linked and reinforce each other, such as for example, education and income. One would imagine that such a link also exists for education and labour market outcomes. This report examines this possibility. The contribution of this report is to use well-established international approaches to analyse the intergenerational correlation of labour market outcomes and education outcomes for Australia, whilst controlling for other factors that may affect these outcomes. Most of the evidence for Australia has been based on cross tabulations and other descriptive analyses.

We extend the analysis of Maloney, Maani and Pacheco (2003) by explicitly allowing for correlation of unobserved factors in the two equations estimated (education and labour market outcomes, in our case). In addition, most of the studies discussed in this section examine one possible outcome at the time, whereas the aim of our analysis is to allow for the intergenerational correlation of education and labour market outcomes, and to allow for the endogeneity of education in the labour outcome equation. The intergenerational correlation of labour market outcomes is therefore allowed to be direct (through parents' labour market outcomes on children's labour market outcomes) and indirect (through parents' labour market outcomes and education on children's education, which then affects children's labour market outcomes).

3. The HILDA Data

3.1 The general sample

The first central variable on which the analyses in this report are based is the proportion of time unemployed since completing full-time education. This is calculated as ratio of the

time spent unemployed (in years) since completing full-time education to the total time (in years) since completing full-time education. The time spent in unemployment is defined as time out of work, but in the labour force (as reported by the respondent). That is, they were not working, but they were looking for work or at least wanted to work.

Unfortunately, the total time (in years) since completing full-time education appears to be subject to significant measurement errors. The evidence from the HILDA suggests that the time since completing full-time education includes in many cases the time spent in tertiary education. Consequently, the measure is overstating the total time since leaving full-time education for individuals with higher qualifications. For a large proportion of respondents, the observed total time since leaving full-time education implies that they would have finished a university degree at 17, 18 or 19 years of age. As a result, the proportion of time unemployed since completing full-time education is underestimated for these individuals. Nevertheless, the consequences of this underestimation are likely to be limited given that the time in unemployment is generally very low anyway for these individuals with higher qualifications.

The implications of this measurement error in total time since leaving full-time education are more serious for the second variable that we had in mind as a dependent variable in our analyses, which is the proportion of time not in work since completing full-time education. The time not in work is defined as all time not in work, either in or out of the labour force. It includes, for example, time spent at home looking after the children. It appears that the time not in work as reported in the HILDA may include the time spent in tertiary education. Comparing respondents at lower and higher education levels, it shows unlikely high values for individuals with higher qualifications. Since no additional information is available which would allow us to correct for this bias, the proportion of time not in work over the available waves of the HILDA is used instead of the time not in work since completing full-time. The time span is thus more limited but the information is more accurate and does not suffer from the upward bias for respondents at higher education levels. Up to five waves can be used when the information is available but the proportion of time not in work is computed, for example, over a single year if information about an individual was only collected for one wave. For 90 per cent of the respondents, this information was collected over at least four waves.

The proportion of time unemployed would probably be a better indication of labour market disadvantage than the time not in work, since the latter may include voluntary spells out of the labour force which are in accordance with the person's preferences. However, time not in

work could also include discouraged workers who have given up finding a job even though they would prefer to be in employment. Given the potential of missing this important group when solely focussing on time unemployed, it is of interest to investigate the effect of parental labour market and education outcomes on both measures.

The summary statistics, to be presented in Section 4, are based on information from wave five of the HILDA, since the parental education questions were not asked in any of the previous waves. The general sample of analysis is restricted to wave five respondents between 25 and 54 years old, from which we further excluded the following groups:

- 193 respondents with either no information about the time since completing full-time education, the time in paid work since completing full-time education or the time spent unemployed since completing full-time education

- 24 respondents without information about the number of siblings

- 104 full-time students

- 601 respondents with no information about at least one of their parents' labour market outcomes

After the above exclusions, the sample of analysis consists of 2,652 men and 3,084 women.

To establish the presence of intergenerational correlation, information on labour market outcomes (LMOs) of the respondent's parents is required. There are a few important retrospective variables collected in the HILDA survey which enable us to investigate the intergenerational correlation between the labour market and education outcomes of parents and their children. First, information on the parents' labour force status and occupation when the respondent was 14 is collected. That is, in the HILDA survey, respondents are asked whether their father and their mother were employed when they were 14 years old. This information is used as a proxy for the LMO of the respondents' parents. Additional LMO information is available regarding the father. That is, the survey collects information on the presence of unemployment spells (which when put together were longer than six months in total) for the father during the period the respondent was growing up. Second, in wave five, information on the education level of the respondent's parents is collected.

3.2 Youth Sample

The project also aims to analyse a subsample of young individuals, who are still living with their parents. To limit problems of selectivity (for example, if children are more likely to live

away from the parental home because they have a good job), we focus on children under 18 at the time when they are first observed in the survey. The majority in this group is expected to live with their parents independent of their labour force status. We can follow these individuals for at most five years. Even if they move out of the parents' home, they are still in scope for the HILDA survey.

The initial sample of youths who are still living with their parents and under 18 when they were first observed in the survey consists of 2,002 individuals. Summary statistics regarding this sample are provided in section 6.

The same variables as discussed for the general sample are available for this subgroup of youth. In addition, there is much more information on their parents who are also part of the HILDA survey. The dependent variables of interest are somewhat different from those for the general population. Participation in education is an important activity for this age group in addition to labour market status.

4. Summary statistics for the general sample

4.1 Labour market outcomes

Table 1a summarises the proportion of time spent in unemployment since completing full-time education depending on the parents' LMOs. The numbers in the table are weighted using the population weights provided in the HILDA data.[4] Some of the subgroups contain very few observations (reported on the third row for each group), so caution should be taken when drawing conclusions. For example, most respondents' fathers were employed at the time the respondent was 14 and most respondents' fathers spent less than 6 months being unemployed while the respondent was growing up. As a result, the other categories are relatively small. Standard errors are reported on the second row so that the significance of differences between groups can be assessed.

The proportion of time in unemployment for women appears to be independent of the LMO of these women's mothers, whereas for men having had an employed mother at age 14 is slightly positively correlated with the time in unemployment, although the difference between the two groups is insignificant. This counterintuitive effect can be explained by the fact that the mother's employment is less an indication of potential disadvantage suffered by their children than the father's employment is, especially for respondents who grew up a few decades ago. A bad LMO of the father is likely to increase their sons' and daughters' time

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[4] In this report, all tables are based on weighted numbers unless otherwise specified.

spent in unemployment since completing full-time education, independent of the measure used for the father's LMO. The fact that men spend on average a larger proportion of their time being unemployed than women reflects the fact that a larger proportion of their time is spent in the labour force.

Table 1a Average proportion of time unemployed since completing full-time education (in %) by parents' employment at age 14 and fathers' unemployment during childhood

	Mother was employed	Mother was not employed	Mother was deceased	ALL
Men				
Father was employed	4.3	3.3	1.4	3.8
Standard error	0.4	0.3	0.7	0.3
Number of observations	1,379	1,114	29	2,522
Father was not employed	4.4	8.4	-	6.5
Standard error	1.6	3.0	-	1.8
Number of observations	26	40	0	66
Father was deceased	4.7	6.5	-	5.6
Standard error	1.2	1.9	-	1.1
Number of observations	34	30	0	64
ALL MEN	4.3	3.6	1.4	3.9
Standard error	0.4	0.3	0.7	0.2
Number of observations	1,439	1,184	29	2,652
Women				
Father was employed	3.1	3.1	1.8	3.1
Standard error	0.3	0.3	0.7	0.2
Number of observations	1,577	1,294	28	2,899
Father was not employed	5.6	6.8	19.8	6.3
Standard error	1.6	1.6	-	1.2
Number of observations	61	65	1	127
Father was deceased	3.0	7.4	10.7	5.4
Standard error	1.3	5.1	7.5	2.3
Number of observations	30	25	3	58
ALL WOMEN	3.2	3.3	3.6	3.2
Standard error	0.3	0.3	1.6	0.2
Number of observations	1,668	1,384	32	3,084
Men				
Father was unemployed for 6 months or more	8.3	6.2	5.7	7.4
Standard error	1.7	1.2	2.4	1.1
Number of observations	154	117	3	274
Father was not unemployed	3.8	3.2	0.8	3.5
Standard error	0.4	0.3	0.6	0.2
Number of observations	1,285	1,067	26	2,378
Women				
Father was unemployed for 6 months or more	4.6	4.3	8.9	4.5
Standard error	0.9	0.7	6.0	0.6
Number of observations	212	174	3	389
Father was not unemployed	3.0	3.1	3.1	3.1
Standard error	0.3	0.3	1.6	0.2
Number of observations	1,456	1,210	29	2,695

Table 1b examines the correlation of the proportion of time not in work over the available waves and the LMO of the respondents' parents. Similar to Table 1a, caution is required when interpreting the results with regard to the number of observations in each cell. The standard errors give an indication of the significance of the differences across cells.

Table 1b Proportion of time not in work (in %) over the available waves by parents' employment at age 14 and fathers' unemployment during childhood

Men	Mother was employed	Mother was not employed	Mother was deceased	ALL
Father was employed	11.0	9.3	1.6	10.1
Standard error	*0.9*	*0.8*	*1.1*	*0.4*
Father was not employed	4.5	17.5	-	11.2
Standard error	*3.2*	*46.7*	*-*	*14.8*
Father was deceased	5.4	15.0	-	10.0
Standard error	*1.4*	*3.7*	*-*	*1.2*
ALL	10.7	9.7	1.6	10.1
Standard error	*0.8*	*0.8*	*1.1*	*0.4*
Women				
Father was employed	26.3	31.0	36.4	28.5
Standard error	*1.2*	*1.7*	*85.8*	*0.7*
Father was not employed	49.9	44.3	61.9	47.3
Standard error	*44.1*	*30.9*	*-*	*18.9*
Father was deceased	17.8	31.2	38.6	25.0
Standard error	*38.2*	*71.5*	*372.2*	*26.7*
ALL	27.1	31.6	37.5	29.3
Standard error	*1.2*	*1.6*	*66.8*	*0.7*
Men				
Father was unemployed for 6 months or more	16.8	16.3	0.5	16.4
Standard error	*11.3*	*18.5*	*0.2*	*6.9*
Father was not unemployed	9.9	8.9	1.8	9.3
Standard error	*0.8*	*0.7*	*1.4*	*0.4*
Women				
Father was unemployed for 6 months or more	35.1	40.0	22.8	37.3
Standard error	*10.3*	*14.5*	*336.5*	*5.9*
Father was not unemployed	25.9	30.3	38.8	28.0
Standard error	*1.3*	*1.8*	*76.1*	*0.7*

Not surprisingly, the proportion of time spent not in work is on average three times higher for women than for men. Both male and female respondents spend more time not in work if their father was unemployed for more than 6 months when they were growing up. Interestingly, the first measure of the father's LMO (whether he was employed or not when the respondent was 14) indicates that the father's employment when the woman was 14 is negatively correlated with the time out of work for these women later in life, although the standard error is very high for the group whose fathers were not employed. This relationship is barely present for

men. There is no significant variation in the time not in work of men depending on the employment status of either parent when they were 14. The time not in work slightly varies with the mother's LMO for female respondents but hardly changes for men. Women spend on average less time out of work if their mother was employed when they were 14. This may be an indication that female labour force participation is influenced by their mothers' labour force participation while they were growing up. In addition, it is likely to be a generational issue with younger respondents being more likely to have had employed mothers than the older generation of respondents, and also, younger female respondents being more likely to be in work.

Tables 1a and 1b show that the father's labour market status is more important than the mother's employment in determining the time spent in unemployment and out of work by their children. In summary, the effect of the mother's employment is counterintuitive for men, with the mother's employment increasing the average time spent in unemployment. Whereas for women this effect is as expected (although very small) if their father did not have unemployment spells totalling over 6 months. If the father had unemployment spells over 6 months, the mother's employment on average increases the average proportion of time spent in unemployment by the respondent. The mother's employment reduces the average time not in work for women, but not for men.

Disaggregating the data in a different way reveals that the presence of the mother in the house when the respondent was 14 (that is, the mother and the respondent lived in the same house) might matter more than her employment status. However, the number of respondents for whom the mother was not present when they were 14 is fairly small (see Table 2a). Table 2a replicates Tables 1a and 1b using the mother's presence instead of the mother's LMO.

Table 2a shows that the presence of the mother in the household is negatively correlated with the proportion of time in unemployment for both men and women. The correlation is more pronounced for women than for men, and the difference in time in unemployment is only significant for women. Similarly, the presence of the mother seems correlated with the time not in work for women but this relationship is much weaker for men. Women, whose mother was present in the household at the age of 14, are likely to spend less time out of work, with the difference between the two groups regarding the time not in work being significant at the 10 per cent level.

Table 2a Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by labour market outcome of the father and presence of the mother in the house when respondent was aged 14

	Men			Women		
	Mother was not present	Mother was present	ALL	Mother was not present	Mother was present	ALL
Father was employed						
Time unemployed	4.4	3.8	3.8	5.3	3.0	3.1
Standard error	*0.8*	*0.3*	*0.3*	*1.2*	*0.2*	*0.2*
Time not in work	11.3	10.0	10.1	35.1	28.3	28.5
Standard error	*2.9*	*0.7*	*0.6*	*4.3*	*0.8*	*0.8*
Number of observations	118	2,404	2,522	118	2,781	2,899
Father was not employed						
Time unemployed	20.2	5.5	6.5	13.0	5.5	6.3
Standard error	*13.3*	*1.5*	*1.8*	*4.8*	*1.2*	*1.2*
Time not in work	27.8	10.0	11.2	57.9	46.1	47.3
Standard error	*18.0*	*3.8*	*3.8*	*10.2*	*4.7*	*4.3*
Number of observations	7	59	66	14	113	127
Father was deceased						
Time unemployed	22.6	4.0	5.6	7.5	5.2	5.4
Standard error	*4.5*	*0.9*	*1.1*	*5.8*	*2.5*	*2.3*
Time not in work	25.3	8.6	10.0	36.6	23.3	25.0
Standard error	*9.1*	*3.3*	*3.2*	*14.4*	*5.5*	*5.2*
Number of observations	5	59	64	6	52	58
ALL						
Time unemployed	5.5	3.9	3.9	6.2	3.1	3.2
Standard error	*1.0*	*0.3*	*0.2*	*1.2*	*0.2*	*0.2*
Time not in work	12.4	10.0	10.1	37.5	28.9	29.3
Standard error	*2.9*	*0.6*	*0.6*	*3.9*	*0.8*	*0.8*
Number of observations	130	2,522	2,652	138	2,946	3,084
Father was unemployed for more than 6 months						
Time unemployed	9.5	7.3	7.4	8.5	4.3	4.5
Standard error	*4.2*	*1.2*	*1.1*	*4.4*	*0.6*	*0.6*
Time not in work	16.5	16.4	16.4	30.0	37.6	37.3
Standard error	*7.3*	*2.8*	*2.6*	*10.9*	*2.5*	*2.4*
Number of observations	23	251	274	14	375	389
Father was not unemployed for more than 6 months						
Time unemployed	4.9	3.4	3.5	5.9	2.9	3.1
Standard error	*0.9*	*0.2*	*0.2*	*1.2*	*0.2*	*0.2*
Time not in work	11.7	9.2	9.3	38.5	27.6	28.0
Standard error	*3.1*	*0.6*	*0.6*	*4.1*	*0.9*	*0.9*
Number of observations	107	2,271	2,378	124	2,571	2,695

Table 2b examines the correlation of the labour market outcomes of the respondent with the presence of the father in the house and the labour market status of the mother when the respondent was aged 14. Both men and women tend to spend more time in unemployment and not in work if their father was not present in the house, independent of the labour market outcome of their mother.

Table 2b Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by presence of the father in the house when respondent was aged 14 and labour market outcome of the mother

	Men				**Women**			
	Mother was employed	Mother was not employed	Mother was deceased	**ALL**	Mother was employed	Mother was not employed	Mother was deceased	**ALL**
Father was not present								
Time unemployed	5.7	4.7	0.4	5.2	4.4	7.0	6.8	5.5
Standard error	*0.8*	*0.7*	*0.2*	*0.5*	*0.8*	*1.4*	*4.8*	*0.8*
Time not in work	12.2	12.1	0.4	12.0	30.0	38.5	49.3	33.7
Standard error	*2.2*	*3.0*	*0.4*	*1.8*	*2.9*	*3.7*	*16.6*	*2.3*
Number of observations	190	120	4	314	244	161	7	412
Father was present								
Time unemployed	4.1	3.4	1.5	3.8	3.0	2.8	2.5	2.9
Standard error	*0.4*	*0.3*	*0.8*	*0.3*	*0.3*	*0.2*	*1.1*	*0.2*
Time not in work	10.5	9.4	1.8	9.9	26.6	30.8	33.3	28.6
Standard error	*1.0*	*0.9*	*1.2*	*0.7*	*1.2*	*1.3*	*9.0*	*0.9*
Number of observations	1,249	1,064	25	2,338	1,424	1,223	25	2,672

A small positive but insignificant correlation between the time spent in unemployment by women on one hand, and employment of their mother on the other hand, is apparent only if the father was present. If the father is absent, the mother's employment affects the woman's time in unemployment negatively (although remaining insignificant). A possible explanation for this difference in effect by the father's presence is that the role model represented by the mother is more important when the father is not present. However, the time spent not in work by women is affected by the mother's labour market outcome independent of the father's presence.

This difference in the effect of the mother's employment by the father's presence is not evident for men. The observations made regarding Tables 1a and 1b are similar to those that can be made based on Table 2b. That is, for men, having an employed mother at age 14 is positively correlated with the time in unemployment and, to a lesser extent, the time not in work.

Most of the differences reported in Table 2b are not significant. Of all the effects discussed above, only the difference in time in unemployment for women for the overall groups with and without the father present at age 14 is significant.

4.2 Education

Tables 3a and 3b present results on the proportion of time unemployed and not in work for each education category by the fathers' LMO and the mothers' presence in the household at age 14 for men and women respectively. As in the previous subsection, caution is required regarding the sample size in some of the cells. There are very few observations on respondents whose mother was not present at age 14, in particular when combined with the father being unemployed for more than 6 months.

Table 3a Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by education, labour market outcome of the father and presence of the mother in the house when the respondent was aged 14 (men)

MEN	Father was unemployed for 6 months or more				Father was not unemployed for more than 6 months				ALL MEN	
	Mother not present		Mother present		Mother not present		Mother present			
< Year 10	Mean	Std. error	Mean	Std. error	Mean	Std. error	Mean	Std. error	Mean	Std. error
Time unemployed	33.1	18.6	15.8	4.5	7.9	2.8	6.6	1.7	7.6	1.6
Time not in work	72.9	18.5	30.4	9.0	48.0	14.4	32.2	5.0	34.3	4.5
Column percentage	*13*		*3*		*11*		*4*		*5*	
Year 10 or 11										
Time unemployed	28.0	0.0	16.6	4.5	6.5	2.6	6.3	0.8	7.6	0.9
Time not in work	78.1	0.0	30.4	8.2	11.4	8.4	14.4	1.8	16.3	1.9
Column percentage	*4*		*18*		*20*		*15*		*16*	
Year 12										
Time unemployed	7.6	3.7	6.3	1.6	0.5	0.4	3.8	0.6	4.1	0.6
Time not in work	4.7	5.0	14.0	7.4	5.0	3.0	6.1	1.6	7.1	1.7
Column percentage	*17*		*15*		*7*		*10*		*10*	
Certificate										
Time unemployed	5.1	3.3	7.0	1.7	6.2	1.7	2.8	0.3	3.4	0.3
Time not in work	4.7	3.5	13.3	3.7	9.1	3.7	6.9	0.8	7.6	0.8
Column percentage	*30*		*29*		*35*		*33*		*33*	
Diploma										
Time unemployed	4.9	3.4	4.4	1.4	1.4	1.1	2.2	0.4	2.5	0.4
Time not in work	6.1	5.9	11.9	5.2	6.0	4.5	6.4	1.3	7.1	1.3
Column percentage	*13*		*10*		*11*		*10*		*10*	
University										
Time unemployed	0.0	0.0	2.6	0.7	0.7	0.3	2.2	0.6	2.2	0.5
Time not in work	0.0	0.0	12.5	5.6	1.5	1.1	7.0	1.3	7.5	1.3
Column percentage	*22*		*25*		*17*		*27*		*27*	
ALL										
Time unemployed	9.5	4.2	7.3	1.2	4.9	0.9	3.4	0.2	3.9	0.2
Time not in work	16.5	7.3	16.4	2.8	11.7	3.1	9.2	0.6	10.1	0.6
Number of observations	*23*		*251*		*107*		*2,271*		*2,652*	
Column percentage	*100*		*100*		*100*		*100*		*100*	

Table 3b Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by education, labour market outcome of the father and presence of the mother in the house when the respondent was aged 14 (women)

WOMEN	Father was unemployed for 6 months or more				Father was not unemployed for more than 6 months				ALL WOMEN	
	Mother not present		Mother present		Mother not present		Mother present			
< Year 10	Mean	Std. error	Mean	Std. error	Mean	Std. error	Mean	Std. error	Mean	Std. error
Time unemployed	0.0	0.0	4.3	1.9	20.5	6.5	3.7	0.9	5.0	1.0
Time not in work	40.0	0.0	55.3	7.2	57.1	11.0	46.9	4.9	49.3	3.8
Column percentage	*7*		*10*		*10*		*4*		*5*	
Year 10 or 11										
Time unemployed	38.4	193.1	4.9	1.6	2.7	0.8	3.2	0.2	3.5	0.2
Time not in work	72.4	229.6	46.5	25.1	46.1	61.3	34.6	4.0	36.6	3.4
Column percentage	*36*		*22*		*30*		*23*		*23*	
Year 12										
Time unemployed	.	.	5.2	1.4	4.1	1.7	3.4	0.9	3.7	0.8
Time not in work	.	.	51.6	6.2	26.6	6.4	31.0	2.4	33.8	2.2
Column percentage	*0*		*16*		*15*		*15*		*15*	
Certificate										
Time unemployed	8.7	5.0	5.9	2.0	3.8	1.4	3.8	0.6	4.2	0.6
Time not in work	45.3	24.1	29.8	4.8	43.7	10.4	30.2	2.2	30.8	2.0
Column percentage	*29*		*19*		*19*		*16*		*16*	
Diploma										
Time unemployed	0.0	0.0	3.3	1.5	8.5	2.9	2.4	0.4	2.8	0.4
Time not in work	0.0	0.0	37.0	9.6	36.7	11.0	22.2	2.2	24.4	2.2
Column percentage	*7*		*8*		*12*		*12*		*11*	
University										
Time unemployed	0.8	1.0	2.3	0.5	1.2	0.8	1.9	0.2	2.0	0.2
Time not in work	4.3	1.5	17.2	3.5	8.5	5.1	16.2	1.2	16.1	1.1
Column percentage	*21*		*25*		*15*		*30*		*29*	
ALL										
Time unemployed	8.5	4.4	4.3	0.6	5.9	1.2	2.9	0.2	3.2	0.2
Time not in work	30.0	10.9	37.6	2.5	38.5	4.1	27.6	0.9	29.3	0.8
Number of observations	*14*		*375*		*124*		*2,571*		*3,084*	
Column percentage	*100*		*100*		*100*		*100*		*100*	

Not surprisingly, both the proportion of time unemployed and the proportion of time not in work tend to decrease with the level of education for both men and women. Although this correlation is particularly noticeable at low levels of education, the pattern is more ambiguous at higher levels. In particular, the negative correlation between education and the proportion of time not in work for men, or the proportion of time unemployed for women, is less obvious above Year 12. The clearest relationship is found between education and the proportion of time not in work for women. That is, women with a higher level of education spend on average less time not in work.

As shown in Table 2a, both men and women spend on average more time unemployed and more time not in work if their father was unemployed for more than six months as they were growing up. This is true independent of the mother's presence at age 14.[5] Tables 3a and 3b show that this correlation is also independent of the education level, although the limited number of respondents whose mother was not present only allows meaningful comparisons by education level for respondents whose mother was present.

Comparing the proportion within each column at lower and higher levels of education, it can be seen that there are differences between respondents whose mother was present at age 14 and respondents whose mother was absent at age 14, between respondents whose father was unemployed for 6 months or more and those whose father was not unemployed or unemployed for less than 6 months, and between men and women in general. The proportion of respondents with a university degree is higher if the mother was present in the household at age 14. Although this holds independent of the father's LMO, the correlation appears stronger if the father was not unemployed. That is, the impact of the mother's presence in the household on the proportion of children with a university degree is less pronounced if the father was unemployed. Aside from the relatively small sample size of this subgroup, a possible explanation for this observation could be that the most important factor determining a successful educational outcome is the presence of an adult at home and whether it is the mother or the father who is present is irrelevant.

Examining the father's LMO in isolation: if the father had unemployment spells over 6 months during the respondent's childhood, then education outcomes seem to be of a somewhat lower level. This effect appears stronger for women than men.

There is a negative correlation between the mother's presence in the household and a low education, which is clearly visible in households where the father was not unemployed. Overall, the positive correlation between the mother's presence and the respondent's education level is visible only at very high or very low levels of education (i.e. university or below year 10), while no clear patterns emerge for other levels of education.

Table 3c presents results on the proportion of time in unemployment and not in work by the father's LMO and the mother's employment at age 14 for men and by the education level of the respondents. Table 3d presents the same results for women. Tables 3c and 3d are thus

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[5] The only exception to this concerns women whose mother was not present. For them the proportion of time not in work is on average lower if the father was unemployed for more than 6 months. However, this effect is very insignificant.

similar to Tables 3a and 3b except for the use of the mother's employment status instead of the mother's presence.

Table 3c Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by education and parents' labour market outcomes (men)

MEN	Father was unemployed for 6 months or more						Father was not unemployed for more than 6 months						ALL MEN	
	Mother employed		Mother not employed		Mother deceased		Mother employed		Mother not employed		Mother deceased		ALL MEN	
	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.
< Year 10														
Time unemployed	6.3	2.7	33.1	10.2	-	-	8.8	2.7	4.4	1.1	-	-	7.6	1.6
Time not in work	56.1	18.7	37.1	17.1	-	-	32.7	6.7	34.5	6.7	-	-	34.3	4.5
Column percentage	*3*		*4*		*0*		*4*		*5*		*0*		*5*	
Year 10 or 11														
Time unemployed	17.8	5.6	13.6	5.5	-	-	8.3	1.3	4.4	0.6	1.3	1.0	7.6	0.9
Time not in work	30.4	9.6	33.4	14.3	-	-	17.3	2.9	11.4	2.1	0.5	0.3	16.3	1.9
Column percentage	*20*		*14*		*0*		*14*		*17*		*12*		*16*	
Year 12														
Time unemployed	5.7	1.9	7.2	2.8	9.0	0.0	3.3	0.7	4.3	1.2	1.2	1.1	4.1	0.6
Time not in work	13.0	9.9	14.9	9.7	0.0	0.0	5.6	1.7	6.7	2.8	15.3	7.1	7.1	1.7
Column percentage	*17*		*13*		*33*		*10*		*9*		*8*		*10*	
Certificate														
Time unemployed	8.7	2.8	4.9	1.4	0.3	0.0	3.0	0.4	3.1	0.5	1.3	1.1	3.4	0.3
Time not in work	14.1	4.7	11.3	5.4	2.8	0.0	7.6	1.2	6.7	1.0	2.0	1.8	7.6	0.8
Column percentage	*27*		*31*		*33*		*33*		*33*		*50*		*33*	
Diploma														
Time unemployed	4.2	1.9	5.1	1.7	1.3	0.0	2.1	0.4	2.4	0.7	0.0	0.0	2.5	0.4
Time not in work	12.8	7.3	9.8	4.5	0.0	0.0	7.3	1.7	5.7	2.0	0.0	0.0	7.1	1.3
Column percentage	*9*		*10*		*33*		*10*		*9*		*15*		*10*	
University														
Time unemployed	3.1	1.1	1.9	0.6	-	-	2.1	0.9	2.2	0.5	0.1	0.1	2.2	0.5
Time not in work	8.2	2.7	15.8	10.3	-	-	7.3	1.9	6.4	1.4	0.0	0.0	7.5	1.3
Column percentage	*23*		*28*		*0*		*28*		*26*		*15*		*27*	
ALL														
Time unemployed	8.3	1.7	6.2	1.2	5.7	2.4	3.8	0.4	3.2	0.3	0.8	0.6	3.9	0.2
Time not in work	16.8	3.4	16.3	4.3	0.5	0.5	9.9	0.9	8.9	0.8	1.8	1.2	10.1	0.6
Number of observations	154		117		3		1,285		1,067		26		2,652	
Column percentage	*100*		*100*		*100*		*100*		*100*		*100*		*100*	

Comparing Tables 3c and 3d, there are no general patterns that emerge but two observations can be made. First, men with low education and a father who was not unemployed for more than 6 months in their childhood tend to spend more time in unemployment if their mother was employed. However, this relationship is reversed for men with education levels of Year 12 and above, who spend less time in unemployment if their mother was not employed (and their father was not unemployed for more than 6 months). Second, for women whose father

was not unemployed, the proportion of time not in work is clearly higher if the mother was not employed at age 14, independent of the level of education (although the difference is only significant at the lowest education level).

Table 3d Proportion of time unemployed since completing full-time education and proportion of time not in work over the available waves (in %) by education and parents' labour market outcomes (women)

WOMEN	Father was unemployed for 6 months or more						Father was not unemployed for more than 6 months						ALL WOMEN	
	Mother employed		Mother not employed		Mother deceased		Mother employed		Mother not employed		Mother deceased			
	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.	Mean	Std. err.
< Year 10														
Time unemployed	2.8	2.4	5.1	2.6	-	-	5.1	1.6	5.5	1.7	3.0	7.2	5.0	1.0
Time not in work	50.7	10.0	57.3	9.2	-	-	34.7	5.6	57.6	6.1	24.4	434.5	49.3	3.8
Column percentage	*7*		*13*		*0*		*4*		*6*		*10*		*5*	
Year 10 or 11														
Time unemployed	6.6	2.1	4.9	1.7	12.6	0.0	3.6	0.6	2.8	0.6	2.5	1.3	3.5	0.4
Time not in work	48.5	6.9	46.4	6.9	3.9	0.0	34.3	2.7	35.2	2.9	58.7	14.2	36.6	1.8
Column percentage	*23*		*23*		*33*		*22*		*24*		*41*		*23*	
Year 12														
Time unemployed	4.6	1.8	5.9	2.2	-	-	3.9	1.3	2.6	0.5	2.9	2.2	3.7	0.8
Time not in work	47.0	8.9	56.5	8.6	-	-	30.0	3.1	32.4	3.5	30.5	23.1	33.8	2.2
Column percentage	*15*		*16*		*0*		*16*		*14*		*7*		*15*	
Certificate														
Time unemployed	6.4	3.5	5.1	1.2	19.8	0.0	2.7	0.4	5.1	1.1	0.0	0.0	4.2	0.6
Time not in work	30.8	6.8	29.6	6.6	61.9	0.0	29.4	2.9	32.1	3.2	50.6	30.8	30.8	2.0
Column percentage	*18*		*21*		*33*		*15*		*17*		*10*		*16*	
Diploma														
Time unemployed	4.5	2.4	1.9	1.3	0.0	0.0	3.1	0.6	2.1	0.5	8.9	6.6	2.8	0.4
Time not in work	35.8	12.3	38.2	14.8	0.0	0.0	21.8	2.7	25.1	3.7	23.3	14.5	24.4	2.2
Column percentage	*8*		*7*		*33*		*13*		*11*		*14*		*11*	
University														
Time unemployed	2.4	0.6	1.9	0.7	-	-	1.7	0.3	2.3	0.3	0.0	0.0	2.0	0.2
Time not in work	15.6	4.0	17.7	6.0	-	-	14.6	1.5	17.8	1.8	14.2	13.4	16.1	1.1
Column percentage	*29*		*20*		*0*		*30*		*29*		*17*		*29*	
ALL														
Time unemployed	4.6	0.9	4.3	0.7	8.9	6.0	3.0	0.3	3.1	0.3	3.1	1.6	3.2	0.2
Time not in work	35.1	3.2	40.0	3.8	22.8	18.3	25.9	1.1	30.3	1.3	38.8	8.7	29.3	0.8
Number of observations	212		174		3		1,456		1,210		29		3,084	
Column percentage	*100*		*100*		*100*		*100*		*100*		*100*		*100*	

Regarding the relationship between the mother's employment status and the respondent's education level, Tables 3c and 3d show that for men and women whose fathers were not unemployed for 6 months or more during childhood the education level tends to be higher if their mothers were employed when they were aged 14. A similar pattern emerges for women (but not for men) whose father was unemployed for 6 months or more, but a few more

exceptions appear for this subgroup, possibly due to small numbers of respondents in some of the cells.

4.3 Control Variables

The summary statistics of the variables used in the multivariate analyses in Section 5 are presented in Table 4a for men and in Table 4b for women. All variables are binary variables (with an outcome of either 0 or 1) except for age, number of children, number of waves with preschool-age child(ren) present in the household, number of waves with school-age child(ren) and the health index. The latter is an index ranging from 0 for very poor health to 100 for excellent health.

In Tables 4a and 4b, the sample has been restricted to those for whom information on the education level of their parents was available. As a result, 573 respondents for whom no information was available on the education level of at least one of their parents were excluded. In addition, 76 respondents were excluded because no information was available regarding their health index in either of the HILDA waves.[6]

Men and women tend to have a higher level of education if their mother was present when they were 14 but there is hardly any correlation with the father's LMO; the effect of the father's unemployment on education appears only slightly negative for women.

Comparing across the columns which indicate that the mother was present at age 14, fathers who have been unemployed for more than 6 months are slightly less likely to have a higher level of education. The mother's employment and education level appear to be independent of the father's unemployment over 6 months. Male respondents, whose father was unemployed for more than 6 months while they were growing up, appear somewhat more likely to be from a non-English speaking background, to have completed their education abroad, and to be slightly less healthy. For female respondents no differences in education or migration background are observed, but similar to men they are slightly less healthy if their father was unemployed for at least 6 months during their childhood. In addition, they appear slightly less likely to have a diploma or a university degree and had, on average, more siblings if their father was unemployed for more than 6 months.

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[6] The number of missing values is higher for the health index than for the other variables because it is derived from a self-completed questionnaire. In order to limit the number of missing values, we used the health index derived from previous HILDA waves, if available, whenever the information was missing in wave five.

Table 4a: Summary statistics (unweighted results) for men

	Father unemployed for 6 months or more				Father not unemployed for 6 months or more				ALL MEN	
	Mother not present		Mother present		Mother not present		Mother present			
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Number of observations	19		229		88		2,041		2,377	
Father not unemployed for more than 6 months	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.90	0.01
Father employed at 14	0.79	0.09	0.86	0.02	0.95	0.02	0.96	0.00	0.95	0.00
Father present at 14	0.53	0.11	0.87	0.02	0.66	0.05	0.91	0.01	0.89	0.01
Father deceased at 14	0.00	0.00	0.02	0.01	0.03	0.02	0.02	0.00	0.02	0.00
Mother present at 14	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.95	0.00
Mother deceased at 14	0.11	0.07	0.00	0.00	0.25	0.05	0.00	0.00	0.01	0.00
Mother employed at 14	0.58	0.11	0.57	0.03	0.45	0.05	0.55	0.01	0.55	0.01
Mother not employed at 14 and father unemployed for 6+ months	0.32	0.11	0.43	0.03	0.00	0.00	0.00	0.00	0.04	0.00
Both parents not employed at 14	0.16	0.08	0.07	0.02	0.00	0.00	0.01	0.00	0.01	0.00
Both parents absent at 14	0.47	0.11	0.00	0.00	0.34	0.05	0.00	0.00	0.02	0.00
< Year 10	0.16	0.08	0.02	0.01	0.10	0.03	0.03	0.00	0.04	0.00
Year 10 or 11	0.05	0.05	0.17	0.03	0.20	0.04	0.14	0.01	0.14	0.01
Year 12	0.21	0.09	0.15	0.02	0.07	0.03	0.10	0.01	0.11	0.01
Certificate	0.26	0.10	0.28	0.03	0.34	0.05	0.32	0.01	0.32	0.01
Diploma	0.05	0.05	0.10	0.02	0.10	0.03	0.10	0.01	0.10	0.01
University	0.26	0.10	0.28	0.03	0.18	0.04	0.30	0.01	0.29	0.01
Age	36.8	1.8	38.0	0.5	39.6	0.9	40.6	0.2	40.3	0.2
English speaking migrant	0.00	0.00	0.09	0.02	0.03	0.02	0.08	0.01	0.08	0.01
Non-English speaking migrant	0.11	0.07	0.16	0.02	0.10	0.03	0.10	0.01	0.11	0.01
Health index (SF36)	65	5	67	1	67	2	70	0	70	0
Education completed abroad	0.00	0.00	0.07	0.02	0.02	0.02	0.03	0.00	0.03	0.00
Single	0.26	0.10	0.25	0.03	0.34	0.05	0.21	0.01	0.22	0.01
Ever had a child	0.74	0.10	0.68	0.03	0.68	0.05	0.71	0.01	0.71	0.01
Number of children	1.74	0.36	1.55	0.10	1.78	0.19	1.64	0.03	1.64	0.03
Number of waves with preschool-age child(ren)	1.32	0.43	1.20	0.11	0.89	0.16	1.05	0.04	1.06	0.03
Number of waves with school-age child(ren)	1.58	0.45	1.24	0.12	1.39	0.21	1.70	0.05	1.64	0.04
Mother's education:										
None	0.11	0.07	0.13	0.02	0.09	0.03	0.11	0.01	0.11	0.01
High school	0.42	0.11	0.44	0.03	0.45	0.05	0.48	0.01	0.48	0.01
Year 12	0.11	0.07	0.11	0.02	0.08	0.03	0.10	0.01	0.10	0.01
Employer	0.05	0.05	0.08	0.02	0.16	0.04	0.10	0.01	0.10	0.01
Technical college	0.05	0.05	0.11	0.02	0.11	0.03	0.08	0.01	0.09	0.01
Teachers College	0.05	0.05	0.03	0.01	0.06	0.02	0.05	0.00	0.05	0.00
University	0.21	0.09	0.09	0.02	0.05	0.02	0.07	0.01	0.07	0.01
Father's education:										
None	0.05	0.05	0.14	0.02	0.09	0.03	0.13	0.01	0.12	0.01
High school	0.37	0.11	0.29	0.03	0.27	0.05	0.29	0.01	0.29	0.01
Year 12	0.00	0.00	0.05	0.01	0.06	0.02	0.05	0.00	0.05	0.00
Employer	0.21	0.09	0.24	0.03	0.23	0.04	0.20	0.01	0.20	0.01
Technical college	0.16	0.08	0.17	0.03	0.24	0.05	0.19	0.01	0.19	0.01
Teachers College	0.05	0.05	0.01	0.01	0.02	0.02	0.03	0.00	0.03	0.00
University	0.16	0.08	0.10	0.02	0.09	0.03	0.13	0.01	0.12	0.01
Number of siblings	3.05	0.40	2.91	0.16	3.15	0.20	2.64	0.04	2.68	0.04

Table 4b: Summary statistics (unweighted results) for women

	Father unemployed for 6 months or more				Father not unemployed for 6 months or more				ALL WOMEN	
	Mother not present		Mother present		Mother not present		Mother present			
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Number of observations	*10*		*335*		*93*		*2,360*		*2,798*	
Father not unemployed for more than 6 months	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.88	0.01
Father employed at 14	0.80	0.13	0.81	0.02	0.89	0.03	0.97	0.00	0.95	0.00
Father present at 14	0.50	0.16	0.85	0.02	0.56	0.05	0.90	0.01	0.88	0.01
Father deceased at 14	0.00	0.00	0.01	0.01	0.03	0.02	0.02	0.00	0.02	0.00
Mother present at 14	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.96	0.00
Mother deceased at 14	0.10	0.09	0.00	0.00	0.22	0.04	0.00	0.00	0.01	0.00
Mother employed at 14	0.30	0.14	0.57	0.03	0.39	0.05	0.55	0.01	0.55	0.01
Mother not employed at 14 and father unemployed for 6+ months	0.60	0.15	0.43	0.03	0.00	0.00	0.00	0.00	0.05	0.00
Both parents not employed at 14	0.10	0.09	0.09	0.02	0.05	0.02	0.01	0.00	0.02	0.00
Both parents absent at 14	0.50	0.16	0.00	0.00	0.44	0.05	0.00	0.00	0.02	0.00
< Year 10	0.10	0.09	0.08	0.01	0.06	0.03	0.04	0.00	0.04	0.00
Year 10 or 11	0.20	0.13	0.21	0.02	0.30	0.05	0.21	0.01	0.22	0.01
Year 12	0.00	0.00	0.15	0.02	0.17	0.04	0.15	0.01	0.15	0.01
Certificate	0.30	0.14	0.20	0.02	0.19	0.04	0.15	0.01	0.16	0.01
Diploma	0.10	0.09	0.09	0.02	0.11	0.03	0.12	0.01	0.12	0.01
University	0.30	0.14	0.27	0.02	0.16	0.04	0.32	0.01	0.31	0.01
Age	39.8	2.8	38.6	0.4	39.3	0.9	40.5	0.2	40.2	0.2
English speaking migrant	0.00	0.00	0.10	0.02	0.08	0.03	0.07	0.01	0.08	0.01
Non-English speaking migrant	0.20	0.13	0.13	0.02	0.11	0.03	0.12	0.01	0.12	0.01
Health index (SF36)	64	6	69	1	67	2	72	0	71	0
Education completed abroad	0.10	0.09	0.04	0.01	0.02	0.02	0.05	0.00	0.05	0.00
Single	0.20	0.13	0.24	0.02	0.26	0.05	0.23	0.01	0.23	0.01
Ever had a child	0.80	0.13	0.80	0.02	0.81	0.04	0.78	0.01	0.78	0.01
Number of children	2.10	0.43	1.83	0.07	2.01	0.15	1.83	0.03	1.84	0.03
Number of waves with preschool-age child(ren)	1.10	0.57	1.36	0.10	1.00	0.19	1.09	0.04	1.12	0.03
Number of waves with school-age child(ren)	1.80	0.70	2.28	0.12	2.11	0.22	2.08	0.05	2.11	0.04
Mother's education:										
None	0.20	0.13	0.16	0.02	0.13	0.03	0.14	0.01	0.14	0.01
High school	0.30	0.14	0.44	0.03	0.52	0.05	0.43	0.01	0.43	0.01
Year 12	0.20	0.13	0.07	0.01	0.11	0.03	0.08	0.01	0.08	0.01
Employer	0.10	0.09	0.10	0.02	0.08	0.03	0.11	0.01	0.11	0.01
Technical college	0.10	0.09	0.10	0.02	0.06	0.03	0.12	0.01	0.12	0.01
Teachers College	0.10	0.09	0.03	0.01	0.02	0.02	0.05	0.00	0.04	0.00
University	0.00	0.00	0.09	0.02	0.09	0.03	0.08	0.01	0.08	0.01
Father's education:										
None	0.40	0.15	0.19	0.02	0.22	0.04	0.14	0.01	0.15	0.01
High school	0.00	0.00	0.29	0.02	0.30	0.05	0.28	0.01	0.28	0.01
Year 12	0.00	0.00	0.06	0.01	0.04	0.02	0.05	0.00	0.05	0.00
Employer	0.20	0.13	0.18	0.02	0.22	0.04	0.21	0.01	0.20	0.01
Technical college	0.20	0.13	0.18	0.02	0.09	0.03	0.17	0.01	0.17	0.01
Teachers College	0.00	0.00	0.02	0.01	0.03	0.02	0.02	0.00	0.02	0.00
University	0.20	0.13	0.08	0.01	0.11	0.03	0.14	0.01	0.13	0.01
Number of siblings	3.90	0.79	3.20	0.12	2.89	0.25	2.77	0.04	2.83	0.04

5. Results from the multivariate analysis using the general sample

5.1 The model

The model used to investigate the intergenerational correlation of labour market outcomes consists of a system of two equations. A Tobit equation for the proportion of time unemployed (or not in work) and an ordered Probit equation for the education level are estimated simultaneously. The model allows for the endogeneity of education of the respondent, given that education is likely to be to some extent determined by the same (observed and unobserved) factors as later labour market outcomes.

The central question is whether the parents' labour market outcomes are affecting the respondent's labour market outcome directly and/or indirectly through education. Although this system of equations is formally identified through functional form, the identification is strengthened if there are some explanatory variables that can be argued to affect education but not the labour market outcome. Regressions not included in this report confirm that the parents' education does not directly affect the labour market outcomes of their children but is expected to influence the children's education level. Therefore, the education level of the respondent's parents is included in the education equation of the respondent but not in the labour market outcome equation. Similarly, the number of siblings affects the education level but does not have a direct significant effect on the labour market outcomes in adulthood. This indicates that the parents' education and number of siblings are appropriate instruments for the education level of the respondent.

The model can be described as follows:

$$\text{LMO} = X_1\beta_1 + \gamma\text{EDU} + \varepsilon_1 \tag{1}$$

$$\text{EDU} = X_2\beta_2 + \varepsilon_2 \tag{2}$$

where equation (1) represents the Tobit model explaining labour market outcomes (*LMO*), where *LMO* is either the proportion of time in unemployment since leaving full-time education or the proportion of time not in work over the available waves of the survey. *LMO* is censored at the lower and the upper bound, since no matter how bad someone's chances are in the labour market, they cannot be for more than 100 per cent of the time in unemployment, and no matter how good someone's labour market situation they cannot be unemployed for less than 0 per cent of their time. Therefore, the minimum value of *LMO* is 0 and the maximum value is 100, although the underlying variable representing labour market success

could attain different values for individuals who all have *LMO* equal to 0 or to 100. Equation (2) describes the ordered Probit model used to explain education (*EDU*). *EDU* is a latent variable, which is not observed directly. Instead, we observe discrete education outcomes *EDU** which can take the following six values: less than year 10, year 10 or 11, year 12, certificate, diploma or university degree.

X_1 and X_2 are two sets of individual characteristics which partly overlap in the variables that are included. However, while X_2 includes parents' education and the number of siblings, X_1 does not. The coefficients β_1 include the direct effect of parents' labour outcomes on those of their children while the indirect effect of the parents' labour market outcomes through the children's education level are captured through combining the relevant coefficient in β_2 with γ. In addition, the direct effects of parents' labour market outcomes on the education level of their children are estimated through the coefficients β_2, while controlling for the respondent's characteristics, parents' education and number of siblings.

Replacing *EDU* in (1) leads to:

$$\text{LMO} = X_1\beta_1 + \gamma X_2\beta_2 + \gamma\varepsilon_2 + \varepsilon_1 \tag{3}$$

5.2 Estimation results

The general sample described in Section 3.1 is used to estimate the parameters in the joint model presented in equations (1) and (2). The estimated parameters of the model where the proportion of time spent unemployed since completing full-time education is used as an indicator of labour market outcomes are presented in Table 5. To indicate the significance of the parameters and marginal effects, z-values are presented. Values above 2.58 indicate significance below the 1% level, values above 1.96 indicate significance below the 5% level, and values above 1.64 indicate significance below the 10% level.

Table 5 Results for the simultaneous model of the proportion of time spent unemployed since completing full-time education and education level (unweighted)

	MEN						WOMEN					
	Proportion of time unemployed (equation 1)		Education (equation 2)		Marginal effects on time unemployed		Proportion of time unemployed (equation 1)		Education (equation 2)		Marginal effects on time unemployed	
	Coef.	z-value	Coef.	z-value	Est.	z-value	Coef.	z-value	Coef.	z-value	Est.	z-value
Father unemployed for more than 6 months	7.15	4.88	-0.02	-0.21	1.89	3.90	0.71	0.57	-0.13	-2.05	0.18	0.87
Mother not employed at 14	0.01	0.01			-0.10	-0.43	0.71	1.04			0.14	0.97
Father unemployed for more than 6 months AND mother not employed at 14	-1.98	-0.88			-0.59	-0.84	-0.30	-0.16			-0.06	-0.16
Father absent at 14	1.22	0.92	-0.15	-1.83	0.52	1.26	0.72	0.70	-0.06	-0.86	0.18	0.81
Father deceased at 14	3.83	1.67			1.13	1.56	-2.31	-0.94			-0.48	-0.88
Mother absent at 14	2.74	1.39	-0.42	-3.45	1.25	1.96	2.12	1.19	-0.27	-2.18	0.56	1.42
Mother deceased at 14	-5.65	-1.39			-1.68	-1.31	-3.33	-0.85			-0.69	-0.81
Age (25-29 is the reference group)												
30-34	0.44	0.32	0.14	1.62	-0.01	-0.03	-2.78	-2.40	0.12	1.54	-0.63	-2.71
35-39	-0.88	-0.62	0.09	1.03	-0.35	-0.81	-5.48	-4.65	-0.04	-0.51	-1.11	-4.49
40-44	-1.30	-0.93	0.16	1.91	-0.55	-1.31	-4.72	-4.08	-0.02	-0.27	-0.96	-4.11
45-49	-4.40	-3.01	0.20	2.35	-1.51	-3.63	-8.17	-6.65	-0.03	-0.39	-1.67	-5.94
50-54	-7.31	-4.63	0.26	2.94	-2.44	-5.46	-9.48	-7.22	-0.20	-2.40	-1.86	-6.30
English speaking migrant	1.92	1.39	0.09	1.11	0.47	1.09	0.95	0.79	0.11	1.40	0.14	0.56
Non-English speaking migrant	4.37	3.22	0.35	4.56	0.93	2.28	0.28	0.25	0.16	2.45	-0.02	-0.08
Education completed abroad	3.70	1.68			1.10	1.61	4.82	2.80			0.99	2.55
Ever had a child	-1.45	-1.17			-0.43	-1.14	1.70	1.54			0.35	1.40
Number of children	-0.06	-0.16			-0.02	-0.15	-1.25	-3.59			-0.26	-3.08
Single	5.20	5.69			1.54	3.86	3.52	4.73			0.72	3.41
Partner not employed	1.26	1.09			0.37	1.06	4.72	2.40			0.97	2.12
Health index (SF36)	-0.09	-4.77			-0.03	-6.72	-0.10	-6.30			-0.02	-8.54
Constant	2.97	1.50					5.83	3.79				
Mother's education (none is reference group)												
High school			0.06	0.66	-0.06	-0.67			0.00	-0.01	0.00	0.01
Year 12			0.00	0.02	0.00	-0.02			0.16	1.64	-0.08	-1.44
Employer			0.02	0.20	-0.02	-0.20			0.34	3.82	-0.16	-2.31
Technical college			0.24	2.18	-0.25	-1.84			0.46	5.07	-0.21	-2.53
Teachers College			0.49	3.67	-0.51	-2.35			0.65	5.26	-0.31	-2.50
University			0.44	3.37	-0.46	-2.50			0.79	7.15	-0.37	-2.77
Father's education (none is reference group)												
High school			0.26	2.97	-0.27	-2.17			0.10	1.35	-0.05	-1.18
Year 12			0.46	3.49	-0.48	-2.33			0.41	3.62	-0.19	-2.19
Employer			0.25	2.77	-0.26	-2.17			0.11	1.55	-0.05	-1.36
Technical college			0.55	6.01	-0.58	-2.93			0.35	4.36	-0.16	-2.43
Teachers College			0.73	4.52	-0.77	-2.62			0.61	3.68	-0.29	-2.21
University			0.93	8.64	-0.97	-3.10			0.72	7.83	-0.34	-2.82
Number of siblings			-0.06	-4.95	0.06	2.60			-0.05	-4.91	0.02	2.46
Bound 0			-1.43	-12.32					-1.65	-15.79		
Bound 1			-0.48	-4.36					-0.47	-4.78		
Bound 2			-0.10	-0.94					0.00	-0.04		
Bound 3			0.78	7.09					0.44	4.48		
Bound 4			1.08	9.80					0.79	7.99		
Gamma (coefficient on education in equation 1)	-3.52	-3.33					-2.28	-3.02				
Sigma	14.93	40.18					13.58	40.98				
Rho	0.02	0.23					0.05	0.89				

Note: A z-value above 2.58 indicates significance below the 1% level, a value above 1.96 indicates significance below the 5% level, and a value above 1.64 indicates significance below the 10% level. Marginal effects are in percentage points.

Before discussing the estimation results, we need to discuss the choice of labour market outcome variables to be used in the regression analyses. For the mother there is no choice; the only variable available is whether she was employed when the respondent was aged 14. From the raw data, it is evident that, for the father, the more than 6 months unemployed variable was more important than the employed at age 14 and that interaction of the two variables leads to an odd result for women (see Appendix tables A.1 and A.2). Regarding the latter, the last column in Appendix Table A.2 shows that if the father was not employed when the respondent was aged 14, unemployment for more than 6 months of the father would lead to a lower average proportion in unemployment for women. However, note that the two groups compared only contain 41 and 63 individuals. Overall, both men and women with fathers who were more than 6 months unemployed during their childhood experienced a relatively large proportion of time not in work and in unemployment compared to the other men and women. We do not want the results to be affected by this relatively small subgroup. For this reason, and given the greater relevance of the more than 6 months unemployment variable, the multivariate analyses only use whether or not the father was unemployed for more than 6 months during the respondent's childhood as an explanatory variable.

The results in Table 5 show that the labour market outcomes of the father have a direct effect on the time in unemployment of their sons and to a much lesser (and insignificant) extent on the time in unemployment of their daughters. After controlling for education and a range of other individual characteristics, men are still more likely to have spent more time in unemployment if their father was unemployed for more than six months while they were growing up. The employment status of the mother when the respondent was aged 14 is the only available measure of the mother's labour market outcomes. This is only a snapshot of the mother's labour market outcome at that specific time and is less likely to distinguish between mothers with good or bad labour market histories. Notwithstanding the lower quality of the mother's labour market outcome measure, this measure for mothers is probably less informative anyway since a large proportion of women are/were not in employment due to caring responsibilities, which have usually nothing to do with any disadvantage to the household, particularly not when going back a few decades. This could partly explain why there appears to be no significant relationship between the labour market outcomes of mothers and the time spent in unemployment by their children. This is supported by a crosscheck carried out on the youth sample, which indicated that, overall, the parents' employment status when the respondent was aged 14 appears to be a fairly reasonable proxy to distinguish

between parents with bad and good labour market histories. The youth sample contains more information on the respondents' parents since the parents are also respondents in the HILDA survey. Analysis based on the youth sample revealed that the employment status of the parents when the respondent was aged 14 is a good indicator of the proportion of time they have spent in unemployment since completing full-time education and the proportion of time they have spent not in work over the available waves (see Appendix B). This indicates that, although some detail is lost, the quality of the mother's labour market outcome measure should still be sufficient to identify differences between mothers in outcomes.

The presence of the parents in childhood does not appear to affect the children's labour market outcomes directly, although the absence of the father through death is significant at the 10 per cent level for men. Men spend more time unemployed if their father was deceased when they were aged 14. Having had a child has no significant effect on the time in unemployment for men, while the effect is insignificant positive for women but it becomes significant and negative after the second child. Older respondents (men and women) are less likely to spend a large proportion of their time in unemployment than younger respondents, as are respondents who have a higher score on the health index (that is those who are healthier).

Turning to the education equation in Table 5, it is shown that the education level of each of the parents of the respondent has a positive and significant effect on the respondent's education level. Interestingly the effect of the mother's education on their children's education becomes significant only at the level of technical college or above for sons while the completion of Year 12 by the mother already has a significant impact on their daughter's education. More generally, the impact of the father's education is higher than the mother's education for men while for women, the mother's education appears slightly more important than the father's education.

The absence of the mother when the respondent was 14 has a negative effect on the education of both male and female respondents, but the mother's employment status appeared irrelevant again (and was therefore not included in the regression). Although the fathers' labour market outcomes have no significant effect on the education level of their sons, these outcomes appear to have an impact on their daughters' education. This is similar to the negative effect found by Maloney, Maani and Pacheco (2003) of the parents' welfare participation on the daughter's education. Daughters are more likely to achieve a higher a level of education if their father was not unemployed for more than 6 months, while for the sons it is the presence of the father rather than his labour market outcomes that matters. The absence of the father

has a negative effect on the level of education for men. A final family background variable, which is significant for men and women, is the number of siblings. More siblings result in lower education outcomes for the respondent.

Being a migrant from a non-English speaking country is associated with a higher level of education, but at the same time, it has a direct positive effect on the proportion of time spent in unemployment for men. For women, only the effect on education is significant (and, similar to the effect for men, positive). This effect on education contradicts Casey and Dustmann's (2007) expectation that immigrant's children would be worse off in terms of education accumulation. The net effect of being a migrant on labour market outcomes can be determined by combining these two counteracting effects, which is computed when the marginal effects are calculated.

As expected, the direct effect of education on the time spent in unemployment, as measured through the coefficient gamma, is negative and significant for both men and women with the effect being larger for men than for women. Rather than being unemployed, women are perhaps more likely to leave the labour force if unsuccessful.

The error terms in the two equations appear to be uncorrelated (that is, $\rho=0$). This indicates that we could have used the same specification as Maloney, Maani and Pacheco (2003), ignoring the correlation between the two equations. Appendix C presents results for the labour market outcome equation assuming exogeneity of education. The coefficients in the two specifications of the model are quite similar, with the exception of the constant term. The latter is smaller in the model in Appendix C due to the inclusion of education dummy variables where university is the reference group (contained in the constant term) instead of a latent continuous education variable where zero represents an education level between Year 12 and a Certificate. Since individuals with a higher education level, generally have lower amounts of time in unemployment the shift in reference group to a higher education level decreases the estimate of the constant term.

The marginal effects reported in Table 5 combine the direct and indirect effects of characteristics on the proportion of time in unemployment. For men, significant positive effects are found for those whose father was unemployed for more than 6 months, those whose mother was not present in the household at age 14, those who are from a non-English speaking migrant background, and those who are single. Significant negative effects are found for those who are older and in better health. For women, significant positive effects are found for those who completed their education abroad, those who are single and those whose partner

was not employed. Significant negative effects are found for those who are older (the proportion of time in unemployment decreases steadily with age), those with more children and those in better health. Parental education has a significant negative indirect effect on the proportion of time spent in unemployment for both men and women. The effect works through the positive impact on the respondents' education. Although for men, the father's education has a stronger effect than the mother's education, both effects have a similar size for women.

The same model is also estimated using the proportion of time not in work over the available waves. We do not discuss the results for the education equation, since the estimated parameters in Table 6 are very similar to those in Table 5. The results in Table 6 for the first equation show that the proportion of time not in work over the available waves is directly affected by the labour market outcomes of the father for men; for women this effect is not significant. Men are likely to spend more time not in work if their father spent more than 6 months unemployed.

The employment status of the mother when the female respondent was 14 has a significant effect, very close to the five per cent level, on the proportion of time not in work. Women tend to spend more time not in work if their mother was not employed. This seems to indicate that the mother's labour force status sets an example for her daughters, who appear to follow her behaviour. A similar effect was found in the US by Farré and Vella (2007). The mother's labour market status when the respondent is aged 14 appears irrelevant for men. Women whose father was deceased when they were 14 and men whose mother was deceased spend less time not in work. However, the number of respondents whose mother or father was deceased when they were 14 is very small (see Tables 4a and 4b in Section 4.3).

The effect of age on the proportion of time not in work is particularly important for women. As women become older, they become more likely to join (or rejoin) the labour force and thus spend less time not in work. This age effect is partly counteracted by the effects of the number of children. As expected, women with a child spend more time not in work, and the effect increases with the number of children and the number of waves with preschool-age children, whereas the number of waves with school-age children does not appear important. A woman's age is likely to be correlated with her children's ages, which are known to affect female labour force participation. That is, women with young children (who are also younger themselves) are less likely to be in the labour force than women with older children.

Table 6 Results for the simultaneous model of the proportion of time not in work over the available waves and education (unweighted)

	MEN						WOMEN					
	Proportion of time not in work (equation 1)		Education (equation 2)		Marginal effects on time not in work		Proportion of time not in work (equation 1)		Education (equation 2)		Marginal effects on time not in work	
	Coef.	z-value	Coef.	z-value	Est.	z-value	Coef.	z-value	Coef.	z-value	Est.	z-value
Father unemployed for more than 6 months	17.57	3.63	-0.02	-0.22	2.21	2.70	4.41	0.88	-0.13	-2.06	1.76	1.34
Mother not employed at 14	-0.89	-0.33			-0.42	-0.99	5.30	1.96			1.68	1.89
Father unempl. > 6 months AND mother not empl. at 14	-9.66	-1.27			-1.58	-1.21	-1.98	-0.27			-0.66	-0.27
Father absent at 14	5.29	1.21	-0.15	-1.86	1.03	1.33	1.79	0.45	-0.06	-0.87	0.88	0.65
Father deceased at 14	4.55	0.59			0.74	0.55	-19.62	-1.92			-6.54	-1.86
Mother absent at 14			-0.43	-3.49	0.46	1.58			-0.27	-2.18	1.24	2.06
Mother deceased at 14	-41.79	-2.54			-6.83	-2.29	16.02	1.12			5.34	1.11
Age (25-29 is the reference group)												
30-34	-5.98	-1.31	0.14	1.60	-1.13	-1.54	-6.54	-1.39	0.13	1.59	-2.77	-1.76
35-39	-5.04	-1.08	0.09	1.07	-0.92	-1.21	-13.28	-2.77	-0.03	-0.40	-4.28	-2.75
40-44	-5.03	-1.07	0.16	1.96	-1.00	-1.28	-16.67	-3.37	-0.01	-0.16	-5.50	-3.43
45-49	-9.08	-1.82	0.20	2.38	-1.70	-2.16	-24.03	-4.57	-0.02	-0.30	-7.89	-4.75
50-54	-6.68	-1.27	0.27	2.97	-1.38	-1.65	-26.19	-4.60	-0.19	-2.31	-7.84	-4.38
English speaking migrant	7.95	1.76	0.10	1.17	1.20	1.54	6.83	1.43	0.11	1.34	1.78	1.11
Non-Engl. speaking migrant	18.65	4.19	0.35	4.58	2.67	3.08	19.13	4.36	0.17	2.49	5.60	3.58
Education completed abroad	9.95	1.41			1.63	1.34	15.03	2.16			5.01	2.14
Ever had a child	-8.80	-2.03			-1.44	-1.92	-4.73	-0.99			-1.57	-0.99
Number of children	3.74	2.66			0.61	2.36	9.86	6.80			3.28	5.99
Number of waves with preschool-age child(ren)	0.13	0.14			0.02	0.14	9.67	10.55			3.22	7.91
Number of waves with school-age child(ren)	-2.87	-3.69			-0.47	-3.18	0.34	0.45			0.11	0.46
Single	16.31	5.29			2.67	3.35	11.98	3.95			3.99	3.54
Partner not employed	6.77	1.72			1.11	1.55	29.45	3.65			9.81	3.40
Health index (SF36)	-0.63	-9.97			-0.10	-7.81	-0.54	-8.89			-0.18	-12.30
Constant	21.95	3.47					28.93	4.57				
Mother's education (none is reference group)												
High school			0.05	0.57	-0.05	-0.50			0.00	-0.01	0.00	0.01
Year 12			0.00	-0.01	0.00	0.01			0.17	1.70	-0.79	-1.56
Employer			0.01	0.13	-0.02	-0.11			0.34	3.77	-1.59	-2.99
Technical college			0.24	2.16	-0.26	-1.39			0.46	5.05	-2.13	-3.46
Teachers College			0.47	3.53	-0.51	-1.71			0.64	5.20	-3.01	-3.52
University			0.43	3.18	-0.46	-1.75			0.80	7.20	-3.73	-4.05
Father's education (none is reference group)												
High school			0.26	3.01	-0.28	-1.42			0.10	1.39	-0.47	-1.26
Year 12			0.47	3.58	-0.51	-1.51			0.40	3.60	-1.89	-2.79
Employer			0.26	2.86	-0.28	-1.45			0.12	1.59	-0.55	-1.51
Technical college			0.57	6.05	-0.61	-1.67			0.35	4.41	-1.65	-3.05
Teachers College			0.74	4.56	-0.80	-1.70			0.59	3.60	-2.78	-2.95
University			0.94	8.62	-1.01	-1.74			0.72	7.83	-3.38	-4.06
Number of siblings			-0.06	-4.94	0.06	1.64			-0.05	-4.89	0.24	3.32
Bound 0	-1.43	-12.29					-1.64	-15.74				
Bound 1	-0.47	-4.31					-0.46	-4.68				
Bound 2	-0.10	-0.90					0.01	0.07				
Bound 3	0.78	7.12					0.45	4.60				
Bound 4	1.08	9.82					0.80	8.10				
Gamma (coef. on education)	-6.62	-1.88					-14.05	-4.67				
Sigma	47.04	32.49					57.82	44.47				
Rho	0.01	0.12					0.02	0.32				

Note: A z-value above 2.58 indicates significance below the 1% level, a value above 1.96 indicates significance below the 5% level, and a value above 1.64 indicates significance below the 10% level. Marginal effects are in percentage points.

Male and female respondents who score low on the health index are likely to spend more time not in work compared to healthier respondents. Similarly, single respondents and respondents from a non-English speaking background are more likely to spend a larger proportion of their time not in work. Women whose partner is not employed are also more likely to spend a larger proportion of their time not in work. A similar but smaller effect significant at the 10 per cent level is observed for men.

As was the case for the time unemployed, there is a significant and negative effect of education on the proportion of time not in work, but here the effect is much higher for women. In addition, the effect is significant for men only at the 10 per cent level. Similar to the result in Table 5, there is no evidence of correlation between the two equations, with ρ being far from significant and very small. Assuming exogeneity of education, Appendix C presents the results of the proportion of time not in work equation alone. Similar to what is found for the proportion of time in unemployment, the coefficients in Table 6 and in Appendix C are comparable in direction and size, except for the constant due to the different reference group for education in the two model specifications.

The marginal effects reported in Table 6 combine the direct and indirect effects (through education) of characteristics on the proportion of time not in work over the available waves. For men, significant positive effects are found for those whose father was unemployed for more than 6 months, those who are from a non-English speaking migrant background, those who had more children and those who are single. Significant negative effects are found for those whose mother was deceased at age 14, those who are older, those who have ever had children, those who had school-age children during a larger proportion of the available waves and those who are in better health. For women, significant positive effects are found for those whose mother was not employed at age 14 (just below the 5 per cent level), those whose mother was absent at 14, those who are from a non-English speaking migrant background, those who completed their education abroad, those who have children, particularly of pre-school age, those who are single and those whose partner was not employed. Significant negative effects are found for those whose father was deceased at age 14 (significant just below the 5 per cent level), for those who are older (the proportion of time not in work decreases steadily with age) and those in better health. As observed for the proportion of time in unemployment, the marginal effects of parental education on the proportion of time not in work are negative for both men and women. Although these effects are fairly small and

significant at the 10 per cent level at most for men, they are much larger and highly significant for women.

In summary, we have found the following results in this section:

- The labour market outcomes of men are affected by the labour market outcomes of their father. Even after controlling for education and other individual characteristics, there is a positive intergenerational correlation of labour market outcomes. This conclusion holds for the proportion of time unemployed and for the proportion of time not in work.

- The results do not show any significant intergenerational correlation of labour market outcomes when it comes to the proportion of time unemployed for women. However, there is a significant relationship between the labour market outcomes of the mother and the proportion of time spent out of work by her daughter.

- The presence of the mother in the household when the respondents were 14 has a significant and positive effect on the education level of both men and women.

- The analysis reveals a positive and significant effect of education on good labour market outcomes (through a reduction in the proportion of time in unemployment and not in work).

- The results also show a significant intergenerational relationship between parents' and children's education levels, indicating that there is a direct effect of parents' labour market outcomes on their children's labour market outcomes but also an indirect effect through education.[7]

- The analysis fails to show any significant correlation between the unobserved determinants of education and the unobserved determinants of labour market outcomes. This result suggests that the unobserved determinants of education and those of labour market outcomes captured in the error terms of both equations are different.

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[7] For an analysis of the potential causes for this relationship between the parents' and children's education, see Cardak and Ryan (2006).

6. Restricted sample of youth

6.1 Summary statistics

The sample used in this section of the report consists of youth under 18 years of age who were still living with their parents when they were first observed in the survey. The age limit of 18 was chosen to avoid problems of selectivity, as could occur, for example, due to children being more likely to live away from the parental home because they have a good job. More than three quarters of youth still live with their parents at 18, while this proportion reduces to between 64 and 76 per cent at age 19, depending on which wave of the HILDA is being used (see Table 7). The sensitivity of the results with respect to this cut-off point is assessed.

Table 7 Proportion of youth still living with their parents by age and wave of HILDA (in % of all youth of that age in the HILDA)

	Age							
	15	**16**	**17**	**18**	**19**	**20**	**21**	**22**
Wave 1	98.9	93.8	88.6	77.3	63.9	54.1	44.9	31.3
Wave 2	97.4	95.9	88.1	82.0	66.5	54.0	38.9	36.2
Wave 3	99.3	94.7	92.2	73.1	71.5	56.2	43.4	31.8
Wave 4	96.6	95.7	86.8	84.7	65.3	60.4	53.0	35.4
Wave 5	97.0	93.7	92.1	80.1	76.1	60.6	51.4	39.9

The initial sample contains 2,002 youths of which 91 observations have to be excluded because no information is available about the labour market outcomes of at least one of the respondent's parents. The individuals in the sample are aged between 15 (they are those who were 15 and still living with their parents in wave five of the HILDA) and 22 (they are those aged 18 and living with their parents in wave one of the HILDA, who were observed in wave five as well). The distribution of the sample of analysis by age and sex is presented in Table 8.

Table 8 Distribution by sex and age in the last wave observed in the sample of youth living at home in the first wave of observation (column percentages)

	MEN	WOMEN
15	14.25	15.47
16	16.17	17.75
17	15.15	13.71
18	13.68	13.31
19	11.01	14.32
20	12.61	11.14
21	9.49	8.99
22	7.64	5.31
TOTAL	100	100

Note: Only one observation (from the last wave available) was used for each individual.

Around 90 per cent of the individuals in the sample are still studying (see Table 9). Of the remaining 10 per cent who are not studying, 84 to 85 per cent are working. However, while 82 per cent of the young men, who are working and not studying, work more than 30 hours per week, this proportion is only 64 per cent for young women. More than two thirds of the students are also working, but most in this group work less than 30 hours per week. Male students tend to work longer hours than female students.

Table 9 Workers and students among youth (column percentages)

	MEN		**WOMEN**	
	Studying	Not studying	Studying	Not studying
Not employed	33.0	15.8	28.7	14.9
Employed	67.0	84.2	71.3	85.1
Less than 30 hours/week	*53.9*	*17.7*	*72.5*	*36.2*
More than 30 hours/week	*46.1*	*82.3*	*27.5*	*63.8*
All (row percentages)	88.0	12.0	92.8	7.2

Given that these young respondents were living with their parents when they were first observed in the survey, their parents are also observed in the survey. Consequently, we have access to comprehensive information about the parents and their labour market outcomes. In addition to the parents' labour market status when the child was 14[8], we can compute the proportion of time spent in unemployment since completing education, as well as the proportion of time spent not in work over the last available waves of the HILDA.

6.1.1 Respondents who are neither studying nor employed

Very few young people over 20 are neither studying nor working. Less than four per cent of the male respondents and slightly over five per cent of the female respondents are in this situation. However, there are differences in the probability of neither studying nor working by background characteristics.

Table 10 presents the proportion of young respondents who are studying and/or working by their parents' education level. Both the mother's and the father's education levels have a strong effect on the probability of the respondent studying. If the mother's or the father's education is at the university level, her or his children are more likely to study than children with lower-educated parents. However, the father's education level appears slightly more important than the mother's education level in reducing the risk of the respondent neither

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[8] The information about unemployment spells longer than 6 months for the father cannot be used here because there are too many missing values (this variable is missing for 803 of the observations).

working nor studying. Interestingly, conditional on the respondent being a student, a higher level of education of the parents increases the respondent's probability of working.

Table 10 Respondents education and labour market outcomes by parental education (column percentages)

	Father's education				Mother's education			
	Secondary school	Certificate & diploma	University	Missing	Secondary school	Certificate & diploma	University	Missing
Number of observations	*622*	*762*	*446*	*81*	*971*	*531*	*386*	*23*
Not studying & not working	2.5	0.6	1.0	5.9	1.5	1.4	0.9	12.8
Not studying & working	10.1	9.3	3.1	11.8	10.4	6.8	4.3	16.4
Studying & not working	34.0	22.8	24.6	45.6	28.7	26.6	27.1	38.3
Studying & working	53.5	67.4	71.4	36.7	59.4	65.2	67.7	32.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Chi^2 test: independence of father's education and respondent's outcomes (P-value)		10.5266 (0.000)			Chi^2 test: independence of mother's education and respondent's outcomes (P-value)		9.4662 (0.000)	

Table 11 presents the proportion of young respondents who are studying and/or working depending on their parents' employment status when they were 14. Youths are more likely to be studying if their father or their mother was employed. However, at the same time, they are also more likely to be working while studying.

Table 11 Respondents education and labour market outcomes by parental labour market outcomes when respondent was aged 14 (column percentages)

	Father was not employed	Father was employed	Missing	Mother was not employed	Mother was employed	Missing
Number of observations	*261*	*1520*	*130*	*543*	*1188*	*180*
Not studying & not working	2.4	1.4	1.4	3.1	0.9	0.8
Not studying & working	10.3	7.8	9.3	8.7	7.0	15.0
Studying & not working	40.5	26.6	18.7	38.3	24.3	19.2
Studying & working	46.8	64.3	70.6	50.0	67.8	65.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Chi^2 test: independence of father's education and respondent's outcomes (P-value)			4.0290 (0.000)	Chi^2 test: independence of mother's education and respondent's outcomes (P-value)		10.4304 (0.000)

6.1.2 Early school leaving

Very few young people leave school before completing year 12. Only seven per cent of young males aged 18 or above left school before completing year 12, while the proportion drops to less than three per cent for females. Given the small number of observations involved,

multivariate analyses are not feasible. Instead, Table 12 provides some summary statistics on the early school leavers compared to the rest of the youth sample.

Table 12 The characteristics of early school leavers versus other youth by gender (unweighted)

	MEN				WOMEN			
	Still at school or completed year 12		Did not finish year 12		Still at school or completed year 12		Did not finish year 12	
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Number of observations[a]	*480*		*33*		*458*		*18*	
Percentage of time unemployed (Father)[b]	3.01	0.47	1.96	1.08	2.74	0.52	12.83	7.50
Percentage of time not in work (Father)[b]	9.78	1.24	19.02	8.17	9.89	1.36	18.64	8.69
Percentage of time unemployed (Mother)	2.10	0.31	3.62	1.21	1.88	0.36	5.35	1.67
Percentage of time not in work (Mother)	29.23	1.85	43.18	8.38	27.14	1.87	45.42	9.42
Father absent at 15	0.16	0.02	0.33	0.08	0.15	0.02	0.28	0.11
Father employed at 14	0.86	0.02	0.74	0.08	0.85	0.02	0.67	0.11
Mother absent at 15	0.03	0.01	0.15	0.06	0.03	0.01	0.06	0.05
Mother employed at 14	0.67	0.02	0.48	0.09	0.71	0.02	0.67	0.12
Both parents not employed at 14	0.07	0.01	0.13	0.06	0.07	0.01	0.11	0.07
Father retired	0.05	0.01	0.14	0.07	0.05	0.01	0.08	0.07
Mother retired	0.08	0.01	0.21	0.08	0.07	0.01	0.06	0.06
Migrant	0.10	0.01	0.03	0.03	0.11	0.01	0.00	0.00
Ever had a child	0.02	0.01	0.00	0.00	0.05	0.01	0.33	0.11
No Self Completed Questionnaire	0.01	0.00	0.03	0.03	0.02	0.01	0.00	0.00
Health index (SF36)	75	1	66	3	71	1	55	5
Major City	0.61	0.02	0.55	0.09	0.64	0.02	0.61	0.11
Inner Regional Australia	0.16	0.02	0.09	0.05	0.16	0.02	0.28	0.11
Outer Regional & remote Australia	0.23	0.02	0.36	0.08	0.20	0.02	0.11	0.07
Household gross income (in $1000's)	25.0	1.0	26.7	5.3	26.6	1.1	15.5	2.2
Father's Health index (SF36) missing	0.21	0.02	0.36	0.08	0.18	0.02	0.28	0.11
Father's Health index (SF36)	67	1	71	5	68	1	68	5
Mother's Health index (SF36) missing	0.06	0.01	0.15	0.06	0.07	0.01	0.06	0.05
Mother's Health index (SF36)	68	1	62	4	70	1	69	6
Father's education:								
<= Year 11	0.22	0.02	0.45	0.11	0.23	0.02	0.69	0.13
Year 12	0.07	0.01	0.00	0.00	0.08	0.01	0.00	0.00
Certificate	0.31	0.02	0.41	0.10	0.30	0.02	0.31	0.13
Diploma	0.13	0.02	0.00	0.00	0.10	0.02	0.00	0.00
University	0.27	0.02	0.14	0.07	0.29	0.02	0.00	0.00
Mother's education:								
<= Year 11	0.35	0.02	0.61	0.09	0.38	0.02	0.53	0.12
Year 12	0.13	0.02	0.14	0.07	0.14	0.02	0.12	0.08
Certificate	0.17	0.02	0.11	0.06	0.16	0.02	0.24	0.10
Diploma	0.11	0.01	0.04	0.04	0.11	0.01	0.12	0.08
University	0.23	0.02	0.11	0.06	0.21	0.02	0.00	0.00

Notes: a) This is the total number of observations. For some variables below the number of observations is smaller due to missing values. b) This variable is defined in the same way as in Section 5.

Although the sample of early-school leavers is small, a few specific characteristics are observed. The proportion of youth who did not live with their mother at age 15 is higher among early school leavers. For young males, the same is observed for not living with the father at age 15.

Although the difference is hardly significant, the proportion of retired parents appears to be higher among male early school leavers. Migrants are underrepresented among early school leavers. Female early school leavers live in households with substantially lower incomes and are more likely to have had a child. The education levels of early school leavers' parents are particularly low. Most of them did not finish secondary school. This relationship between the children's and parents' education levels is similar to what is found for the general sample. Finally, early school leavers appear less healthy.

6.1.3 University enrolment

Using the same subsample (of respondents aged 18 and above), Table 13 reports enrolment at university by the parents' labour market outcomes. The employment status of the father appears to be positively correlated with the enrolment of their children at university, but a negative correlation with the mother's employment status is observed. Youths whose mother was employed when they were 14 are less likely to enrol at university.

Table 13 University enrolment by parental labour market outcomes when respondent was aged 14 (column percentages)

	Father was not employed	Father was employed	Missing	Mother was not employed	Mother was employed	Missing
Number of observations	*136*	*767*	*86*	*274*	*587*	*128*
Has enrolled at university	41.3	45.0	23.2	46.8	42.8	30.0
Has not enrolled at university	58.7	55.0	76.8	53.2	57.2	70.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: The few parents who were deceased (7 fathers and 3 mothers) when their child was 14 are recorded as being not employed.

6.1.4 High school achievement

Table 14 reports the self-assessed achievements of youth in their last or most recent year at high school depending on their father's education.[9] The youth subsample is restricted to wave four respondents because this is the only wave for which information about high school achievement was recorded. Self-reported high school achievements appear positively correlated with parental education. As expected the proportions of youth reporting "above average" or "well above average" achievements goes up with the education level of their

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[9] The figures using mother's education are not reported here because they reveal similar patterns.

father. Young males and females tend to perform better in mathematics, in English and overall if their father has a higher level of education. Comparing men and women, men give themselves higher scores in mathematics than women and women give themselves higher scores in English. Overall, women's self-reported achievement levels are higher than men's self-reported achievement levels.

6.1.5 Attitude of youth toward education, financial success and career

Using the youth subsample restricted to wave four respondents, Table 15 examines the youth' attitudes toward their education, financial success and career depending on their parents' labour market outcomes. Young males are more likely to have a negative attitude toward education if their father and/or mother spent a larger proportion of time not in work. The pattern is similar for female respondents, although the correlation with the time spent not in work by the father is not so clear. Interestingly, no clear correlation pattern is observed between the proportion of time spent in unemployment by the parents and the attitude of their children toward education.

The second question deals with the youth' attitude toward money. The data reveal that youth attaching the highest importance to "making a lot of money now" tend to be those whose parents have spent more time in unemployment or not in work, where the fathers' outcomes appear more important and the effect of time not in work is clearer for male respondents than female respondents. A possible explanation is that growing up in a household with fewer employed adults increases the probability of experiencing financial stress, which may reinforce the children's desire to avoid this type of stress. Surprisingly, the same youths do not seem to attach a high importance to having a successful career. Indeed, Table 15 shows that youth who attach a low level of importance to a successful career at age 35 have parents who spent the largest proportions of time unemployed or not in work. Hence, the picture painted by Table 15 is that youth whose parents have adverse labour market outcomes attach a high importance to making a lot of money now but do not necessarily associate making money with having a successful career later in life.

Table 14 Self-reported high school achievements by father's education

	MEN					WOMEN				
	Father's education				ALL MEN	Father's education				ALL WOMEN
How well did you do in mathematics?	Secondary school	Certificate & diploma	University	Missing		Secondary school	Certificate & diploma	University	Missing	
Refused/Don't know/Not applicable	2.3	1.8	2.5	0.0	2.1	5.4	4.6	2.9	16.7	4.7
[1] Well above average	8.9	11.2	22.1	11.1	13.1	7.9	8.9	20.0	16.7	11.8
[2] Above average	20.1	26.0	31.9	22.2	25.5	22.8	28.7	30.6	16.7	27.1
[3] About average	47.2	43.3	30.1	55.6	41.5	49.0	38.8	34.7	50.0	41.2
[4] Below average	15.9	14.1	11.7	11.1	14.0	10.9	14.3	10.0	0.0	11.8
[5] Well below average	5.6	3.6	1.8	0.0	3.8	4.0	4.6	1.8	0.0	3.5
Total	100	100	100	100	100	100	100	100	100	100
How well did you do in English?										
Refused/Don't know/Not applicable	1.4	0.0	1.2	0.0	0.8	0.5	0.4	0.0	0.0	0.3
[1] Well above average	3.3	6.5	19.0	11.1	8.6	9.4	17.3	27.1	25.0	17.6
[2] Above average	23.4	36.1	33.7	44.4	31.5	35.1	38.4	39.4	50.0	37.8
[3] About average	55.1	44.8	37.4	44.4	46.3	46.5	36.3	28.8	25.0	37.4
[4] Below average	13.6	10.1	6.7	0.0	10.3	5.0	6.3	4.1	0.0	5.2
[5] Well below average	3.3	2.5	1.8	0.0	2.6	3.5	1.3	0.6	0.0	1.8
Total	100	100	100	100	100	100	100	100	100	100
How well did you do overall?										
Refused/Don't know/Not applicable	1.4	0.4	1.8	0.0	1.1	0.5	0.4	1.8	0.0	0.8
[1] Well above average	5.1	7.2	16.6	0.0	8.7	6.9	9.7	22.9	25.0	12.7
[2] Above average	22.0	35.0	41.7	77.8	33.0	35.1	37.6	41.2	25.0	37.5
[3] About average	55.1	49.8	34.4	22.2	47.4	51.0	45.6	31.8	41.7	43.5
[4] Below average	14.0	5.1	3.7	0.0	7.5	4.0	5.9	1.8	8.3	4.2
[5] Well below average	2.3	2.5	1.8	0.0	2.3	2.5	0.8	0.6	0.0	1.3
Total	100	100	100	100	100	100	100	100	100	100
Number of observations	*214*	*277*	*163*	*9*	*663*	*202*	*237*	*170*	*12*	*621*

Table 15 Youth attitudes toward education and parents' labour market outcomes

| | MEN | | | | WOMEN | | | | Number of observations | |
| | Percentage of time unemployed | | Percentage of time not in work | | Percentage of time unemployed | | Percentage of time not in work | | | |
Important now - Getting more education?	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Men	Women
[0] Not at all important	6.2	2.3	14.7	43.5	1.3	2.9	0.3	47.2	35	13
1 to 4	2.9	3.4	15.8	33.8	4.0	3.1	16.1	47.3	50	38
5	3.7	3.2	12.3	34.1	1.7	1.5	13.5	24.9	58	33
6	5.3	2.9	10.7	25.4	3.1	3.4	17.7	28.7	47	39
7	1.2	1.3	5.1	27.4	5.1	1.6	8.3	22.4	77	59
8	3.0	1.5	6.7	23.6	3.0	1.6	9.0	23.4	118	131
9	1.5	1.8	9.1	29.2	3.2	1.4	12.0	26.9	103	112
[10] 10- Very important	3.2	2.1	9.1	23.7	3.0	2.1	8.7	28.4	175	196
Important now - Making a lot of money?										
0 to 3	2.1	1.9	8.2	26.0	1.2	1.3	6.2	31.6	50	44
4	1.5	0.7	7.6	33.8	1.9	0.6	10.1	20.0	34	34
5	2.0	2.1	2.7	22.0	2.4	2.0	14.1	32.0	77	94
6	3.4	2.1	4.3	22.7	2.7	1.6	11.2	21.6	87	118
7	1.5	1.7	7.4	21.8	3.2	1.7	7.5	27.8	112	130
8	3.8	1.8	14.9	31.7	3.2	1.5	11.1	29.2	98	91
9	3.3	1.6	10.2	26.6	2.4	3.5	11.7	32.3	58	41
[10] 10- Very important	4.4	3.2	14.6	35.1	7.4	3.8	11.2	30.4	147	69
Important at 35 - Having a successful career?										
0 to 4	5.7	1.3	16.7	45.2	1.1	2.2	0.5	54.1	9	14
5	9.5	2.4	27.2	44.5	2.8	0.7	27.4	32.4	13	15
6	2.9	1.8	8.6	32.1	1.0	0.8	7.4	39.8	13	22
7	2.7	1.2	9.3	36.7	0.9	2.6	7.1	16.0	39	46
8	2.3	2.2	6.8	22.8	4.0	1.7	6.8	35.1	122	104
9	2.1	2.0	10.3	27.1	2.2	1.8	11.7	24.8	138	160
[10] 10- Very important	3.3	2.2	9.2	27.5	4.1	2.2	11.5	26.3	329	260
ALL	**3.0**	**2.1**	**9.4**	**27.8**	**3.2**	**2.0**	**10.4**	**27.9**	**663**	**621**

6.2 Results from multivariate analyses of high school achievement and career attitude

Two separate ordered Probit models are estimated using the youth sample. The first model aims to explain self-assessed overall achievements of youth in their last or most recent year at high school, and the second model focuses on attitudes toward career development. These two variables are described in sections 6.1.4 and 6.1.5.

The sample is further restricted for the purpose of the multivariate analyses so that it contains only youths for whom the parents' labour market outcomes are available. That is, youths whose parents were absent or did not respond to the HILDA survey are excluded, as well as youths whose parents were retired. After the above exclusions, the sample of analysis consists of slightly more than 900 men and women.

In addition, the two dependent variables are recoded. For easier interpretation, the high school achievement variable is inverted so that higher scores mean better achievements. The number of categories for the second dependent variable on the importance of a successful career at age 35 (see Table 15) is reduced from ten to five categories, given the very small number of respondents attaching a low importance to the question. Respondents with a score lower or equal to five are grouped together, as well as respondents with a score of six or seven, so that the respondents' scores are grouped as follows: 1 to 5, 6 to 7, 8, 9 and 10.

The results presented in Table 16 suggest that parental education has a positive effect on overall high school achievements, although the effect is significant only for parents with a diploma or a university degree. Men do better at high school if their father has a diploma or a university degree but they are not affected by their mother's education. In contrast, there is a positive effect of both the mother's and father's education on women's achievements. This is similar to what Heineck and Riphahn (2007) found for Germany.

The other significant coefficients suggest that respondents in better health do better at high school and that females have higher self-assessed high-school achievements than men. The percentage of time spent not in work by the father over the last waves has a negative effect on the respondent's high school achievements, although the effect is significant only at the 10 per cent level. In addition, self-assessed high-school achievements appear lower for youth between 18 and 20.

The second set of results presented in the last two columns of Table 16 is consistent with Table 15 and indicates that youth tend to attach a lower importance to a successful career if their mother spent more time not in work over the last waves. The analysis also shows that

having a successful career is more important for migrants and people in good health, but apart from these two characteristics, none of the other variables appear important.

Table 16 Multivariate analyses: self-assessed high school achievements and youth attitude toward a successful career (unweighted)

	High school achievement (overall)		Importance of having a successful career at 35	
	Coefficient	z-value	Coefficient	z-value
Number of observations	*913*		*919*	
Percentage of time unemployed (Father)[a]	-0.004	-1.09	0.003	0.65
Percentage of time not in work (Father)[a]	-0.004	-1.87	0.001	0.27
Percentage of time unemployed (Mother)[a]	0.000	0.00	0.006	0.81
Percentage of time not in work (Mother)[a]	0.001	0.55	-0.003	-2.32
Age (15-16 is the reference group)				
17	-0.106	-0.90	-0.132	-1.12
18	-0.211	-1.72	0.069	0.56
19	-0.310	-2.42	-0.060	-0.46
20	-0.248	-1.96	-0.197	-1.54
21	-0.130	-0.94	-0.358	-2.58
22	-0.217	-1.35	-0.246	-1.50
Migrant	0.252	1.53	0.363	2.12
Female	0.412	2.44	0.144	0.84
Health index (SF36)	0.008	4.12	0.004	1.92
Father's Health index (SF36)	0.000	0.11	0.001	0.73
Mother's Health index (SF36)	0.003	1.33	-0.004	-1.83
Father's education (Men):[b]				
Year 12	0.157	0.66	0.138	0.56
Certificate	0.193	1.39	-0.042	-0.30
Diploma	0.629	3.22	0.031	0.16
University	0.642	4.00	0.059	0.37
Mother's education (Men):[b]				
Year 12	-0.065	-0.37	0.108	0.59
Certificate	0.057	0.38	0.162	1.06
Diploma	0.195	1.11	-0.174	-0.99
University	0.223	1.49	0.027	0.18
Father's education (Women):[b]				
Year 12	0.142	0.58	0.122	0.48
Certificate	-0.024	-0.17	-0.085	-0.59
Diploma	0.310	1.52	-0.217	-1.07
University	0.322	1.98	0.047	0.29
Mother's education (Women):[b]				
Year 12	0.145	0.84	-0.267	-1.52
Certificate	0.072	0.47	-0.175	-1.14
Diploma	0.341	1.69	-0.342	-1.72
University	0.377	2.36	-0.214	-1.35
Bound 0	-1.12	-4.00	-1.90	-6.70
Bound 1	-0.44	-1.61	-1.16	-4.19
Bound 2	1.23	4.47	-0.49	-1.77
Bound 3	2.46	8.80	0.13	0.46

Notes: a) This variable is defined in the same way as in Section 5. b) Less than Year 11 is the reference group.

7. Conclusion

This report focuses on the correlation of labour market outcomes of parents and children and investigates whether education is a major factor in this correlation. The labour market outcomes of the children are measured by the proportion of time unemployed since completing full-time education and the proportion of time not in work over the available waves of the HILDA. The labour market outcomes of the father are measured by the presence of unemployment spells longer than six months while the child was growing up while the labour market outcomes of the mother are measured by their employment status when the respondent was 14 years of age.

The descriptive analyses based on the general sample, using simple cross tabulations, all show that there is a relationship between the education and labour market outcomes of individuals with the education and labour market outcomes of their parents. The relationship between parental labour market outcomes and time not in work is only significant for women. Only the father's labour market outcomes are significantly related to the time in unemployment of their sons and daughters. Cross tabulations based on the youth sample show a clear correlation between the parents' and the child's education.

The multivariate analyses, based on the general sample, show that the labour market outcomes of men are affected by the labour market outcomes of their father. Even after controlling for education and other individual characteristics, there is a positive intergenerational correlation of labour market outcomes. This conclusion holds for the proportion of time spent unemployed and for the proportion of time spent not in work by the respondents.

The results do not show any significant intergenerational correlation of labour market outcomes when it comes to the proportion of time unemployed for women. However, there is a significant relationship between the labour market outcomes of the mother and the proportion of time spent out of work by their daughters.

The results also show a significant intergenerational relationship between parents' and children's education levels, indicating that there is a direct effect of parents' labour market outcomes on their children's labour market outcomes but also an indirect effect through education. In addition, the presence of the mother in the household when the respondents were 14 has a significant and positive effect on the education level of both men and women. The analysis reveals a positive and significant effect of education on good labour market outcomes (through a reduction in the proportion of time in unemployment and not in work).

Finally, the analysis fails to show any significant correlation between the unobserved determinants of education and the unobserved determinants of labour market outcomes. This result suggests that the unobserved determinants of education and those of labour market outcomes are different.

The multivariate analyses based on the youth sample suggest that high school achievements are not affected by the parents' labour market outcomes. However, the results show that parental education affects the high school achievements of their children. Men do better at high school if their father has a diploma or a university degree but they are not affected by their mother's education. In contrast, there is a positive effect of both parents' education levels on women's high school achievements.

The attitude of youth toward future career development was found to be difficult to explain. The only significant result emerging from the multivariate analysis suggests that youth tend to attach a lower importance to having a successful career later in life if their mother spent more time not in work over the recent years.

Appendix A

Appendix Table A.1 Average proportion of time not in work over the available waves by the father's labour market outcomes (unweighted)

	MEN			WOMEN		
	Number of observations	Average TNIW	Std error	Number of observations	Average TNIW	Std error
Father not unemployed for more than 6 months AND employed at 14	2050	7.6	0.5	2367	25.2	0.7
Father not unemployed for more than 6 months BUT not employed at 14	79	7.9	2.2	86	26.8	4.0
Father unemployed for more than 6 months BUT employed at 14	213	14.8	2.0	278	29.3	2.3
Father unemployed for more than 6 months AND not employed at 14	35	15.7	5.0	67	39.4	5.0

Note: TNIW = proportion of time not in work over the available waves

Appendix Table A.2 Average proportion of time unemployed since completing full-time education by the father's labour market outcomes (unweighted)

	MEN		WOMEN	
	Father was employed at 14	Father was not employed at 14	Father was employed at 14	Father was not employed at 14
Father was not unemployed for more than 6 months	3.1	1.5	2.6	4.5
Number of observations	*2107*	*26*	*2416*	*41*
Father was unemployed for more than 6 months	6.7	9.2	3.1	3.8
Number of observations	*213*	*31*	*278*	*63*

Appendix B Assessment of the parents' labour market outcome variables

Using an extended subsample of young individuals[10] who were still living with their parents at the time when the HILDA survey started, it is possible to assess the quality of the variables used as proxy for the parents' labour market outcomes in the general sample. These young respondents were asked whether their parents were employed or not when they were 14 years old and whether their father spent more than six months unemployed when they were growing up. This information is similar to the information used to estimate the intergenerational correlation of labour market outcomes for the general sample. In the subsample of young individuals who were still living with their parents, there is also extensive information about the parents since they are also part of the HILDA survey. The proportion of time spent in unemployment since completing full-time education and the proportion of time not in work over the available waves can be computed for the parents. Table B.1 presents the means of these two variables depending on the labour market status of the parents when their child(ren) was (were) 14 as reported by their children.

Table B.1 Proportion of time spent unemployed since completing full-time education and the proportion of time not in work over the available waves of the parents by reported labour market outcomes when their child was 14 – as reported by their children (unweighted)

	Number of observations	Proportion of time unemployed since completing full time education		Proportion of time not in work over the available waves	
		Mean	Standard error	Mean	Standard error
Father was unemployed for more than 6 months	143	8.9	1.3	31.9	10.6
Father was not unemployed for more than 6 months	815	1.3	0.0	2.3	0.1
Missing	812	2.8	0.1	6.1	0.4
Father was not employed at 14	80	7.4	0.9	50.2	22.7
Father was employed at 14	1470	2.2	0.1	3.5	0.1
Missing	220	3.1	0.5	10.4	2.8
Mother was not employed at 14	424	3.1	0.1	70.6	3.2
Mother was employed at 14	1318	1.4	0.0	8.3	0.3
Missing	329	1.3	0.0	23.8	3.8

The table shows that although the employment status of the respondent's parents when the respondent was 14 is only a snapshot, it is highly correlated with their parents' labour market outcomes over a longer period of time. The parents' employment status when their child was 14 seems to be a reasonable indicator to distinguish between bad and good labour market outcomes. Although the presence of unemployment spells longer than 6 months in total

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[10] Unlike for the analyses in Section 6, the sample does not have to be restricted to respondents under 18.

appears highly correlated with the total time spent in unemployment by the father, particular caution should be taken regarding this variable because of the large number of missing values. As mentioned in Section 6.1, this is the reason why this variable is not used for the youth sample.

Appendix C Estimation results assuming exogeneity of education

Table C.1 Tobit analysis of the proportion of time unemployed and time not in work over the available waves by gender (unweighted)

| | Proportion of time unemployed | | | | Proportion of time not in work | | | |
| | MEN | | WOMEN | | MEN | | WOMEN | |
	Coef.	z-value	Coef.	z-value	Coef.	z-value	Coef.	z-value
Father unemployed for more than 6 months	7.14	4.88	0.84	0.68	18.02	3.76	4.51	0.91
Mother not employed at 14	0.01	0.01	0.82	1.20	-0.91	-0.34	5.44	2.03
Father unemployed for more than 6 months AND mother not employed at 14	-1.80	-0.80	-0.43	-0.23	-9.74	-1.30	-1.92	-0.26
Father absent at 14	1.31	0.99	0.74	0.72	3.86	0.90	2.10	0.52
Father deceased at 14	3.58	1.57	-2.26	-0.93	2.28	0.30	-19.21	-1.88
Mother absent at 14	2.88	1.49	2.15	1.22				
Mother deceased at 14	-5.26	-1.30	-2.98	-0.77	-37.44	-2.33	16.09	1.12
Age (25-29 is the reference group)								
30-34	0.25	0.18	-2.76	-2.39	-7.09	-1.57	-6.70	-1.42
35-39	-1.20	-0.85	-5.28	-4.52	-6.11	-1.33	-12.98	-2.72
40-44	-1.54	-1.10	-4.58	-4.00	-6.48	-1.38	-16.34	-3.31
45-49	-4.61	-3.16	-7.86	-6.50	-10.69	-2.16	-23.32	-4.47
50-54	-7.53	-4.77	-8.96	-7.03	-8.24	-1.59	-25.28	-4.51
English speaking migrant	1.83	1.35	0.73	0.62	7.37	1.68	6.09	1.30
Non-English speaking migrant	4.13	3.19	0.33	0.29	18.14	4.31	19.00	4.34
Education completed abroad	3.49	1.59	4.79	2.79	8.81	1.26	14.78	2.13
Ever had a child	-1.45	-1.17	1.47	1.33	-8.84	-2.06	-5.02	-1.05
Number of children	-0.07	-0.18	-1.24	-3.56	3.52	2.54	9.78	6.75
Number of waves with preschool-age child(ren)					0.25	0.28	9.78	10.65
Number of waves with school-age child(ren)					-2.76	-3.58	0.36	0.49
Single	5.18	5.67	3.30	4.44	16.08	5.27	11.95	3.94
Partner not employed	1.32	1.13	4.51	2.30	6.24	1.60	28.71	3.56
Health index (SF36)	-0.09	-4.65	-0.09	-6.14	-0.61	-9.82	-0.53	-8.77
Education (university is the reference group)								
< Year 10	11.09	5.71	4.80	2.88	*38.87*	6.25	47.63	7.26
Year 10 or 11	9.84	8.41	4.72	5.14	13.79	3.59	33.12	9.19
Year 12	4.45	3.40	3.77	3.83	-4.48	-1.01	20.26	5.23
Certificate	4.01	4.07	5.71	5.87	2.86	0.90	20.34	5.22
Diploma	2.17	1.59	2.71	2.52	-3.23	-0.71	8.26	1.93
Constant	-2.47	-1.23	2.03	1.31	15.95	2.48	8.20	1.31
Sigma	14.92	40.33	13.51	41.41	46.52	32.58	57.90	1.30

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