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Abstract

We develop two indicators of the intergenerational transmission of employers with the intention of measuring the role of parental networks and investments in firm specific human capital in determining whether sons are employed at the same firm as their fathers. Using a large administrative data base on a cohort of young Canadian men we find that about 40% have at some point been employed with an employer for which their father also worked, and that about six percent have as their main employer in adulthood the same employer their fathers had 15 to 20 years earlier. The intergenerational transmission of employers reduces the degree of generational earnings mobility, and reveals very different non-linear patterns in the father-son earnings relationship particularly in the bottom half and at the very top of the earnings distribution.

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The Intergenerational Transmission of Employers and Earnings

The nature and extent of the relationship between the adult success of children and their family background is of longstanding interest in the social sciences and public policy. In large part this reflects the idea that the strength of the tie between parent and child outcomes is an interesting characterization of a society, revealing the degree to which inequality is transmitted across the generations and in a broad sense speaking to the notion of equality of opportunity. This interest motivates a literature in labour economics addressing the intergenerational relationship between parent and child earnings. The focus in this research is on the transmission of earnings between fathers and sons, with the objective being the accurate estimation of the intergenerational earnings elasticity in the context of a linear regression to the mean model. Solon (1992, 1989) and Zimmerman (1992) offer a starting point that has led to a large number of studies from a number of countries, surveyed by among others Björklund and Jäntti (2008), Corak (2006) and Solon (2002, 1999).

While highly descriptive this research has also led to a greater appreciation of causal processes, with the findings suggesting that within family—as opposed to peer or neighbourhood—influences play the central role in determining the degree to which a child's life chances are tied to socio-economic background. Nonetheless this leaves a good deal open for interpretation, including the causal role of parental income. The challenge of developing an identification strategy that distinguishes the causal impact of income from the intergenerational transmission of inherent endowments is a basic lesson

of Becker and Tomes (1986, 1979), and characterizes the most recent wave of research in this area. This involves, for example, attention to the development of appropriate treatment and control groups through comparisons of twins, biological and adopted siblings, and neighbours, as in for example Bjorklund *et al* (2002), Bjorklund, Lindahl, Plug (2006), Björklund, Jäntti, and Solon (2007), and Oreopolous (2003). Another particular example is Oreopoulos, Page and Stevens (2008) who take a slightly different tack by examining the interaction between the labour market and how the father's earnings are obtained. They consider job displacement resulting from firm closures to offer exogenous variation in paternal earnings.

Our analysis of intergenerational earnings mobility is a part of this literature, but shifts the emphasis from within family influences and early childhood development to other types of non-monetary investments that parents may make in their children, investments that may help structure their interaction with the labour market at a later stage of the life cycle. We do this by offering an examination of the intergenerational transmission of employers, and the influence this may have on the long-run outcomes of children. As such the paper links the intergenerational earnings mobility literature to two other literatures associated with the likelihood that children will find employment with the same firm that employed their parent: the job search literature, in particular the branch related to the role of networks based on families and friends in generating job offers and possibly influencing reservation wages; and the human capital literature, in particular as it relates to development of firm specific human capital that may alter search costs or wage offer distributions in a way that leads to the intergenerational transmission of employers.

The motivating question of the paper relates the structure of the demand side of the labour market to the long term outcomes of children. If the labour market is structured into high and low paying firms and if close family relatives play an important role in either finding jobs or in firm specific human capital investments, then is it possible that the degree of intergenerational earnings mobility has something to do with the intergenerational transmission of employers? We explore this issue by first briefly reviewing the empirical literature associated with these two processes, and then documenting the extent to which sons are employed in the same firms that employed their fathers using two complementary definitions of the intergenerational transmission of employers. The first is a very broad measure intended to capture the role of parents in conditioning the job search process; the second is narrower and more closely related to models of firm specific human capital investments. The paper then examines the influence that the intergenerational transmission of employers has on estimates of the transmission of earnings, and particularly on non-linear patterns in the intergenerational earnings elasticity.

1. An overview of related literatures

The development of a well-established literature dealing with intergenerational earnings mobility owes a good deal to the clarification of a number of measurement issues, most notably by Solon (1992, 1989) and Zimmerman (1992). They develop and extend concerns about measurement error and life cycle bias in earnings discussed in Bowles (1972), Atkinson, Maynard and Trinder (1983) and Jenkins (1987). Böhlmark and Lindquist (2006), Grawe (2006), and Haider and Solon (2006) offer the most recent

methodological developments. This research is distinct from a longstanding literature in sociology by assuming linearity and continuity of the parent-child earnings relationship, the empirical findings highlighting the average degree of mobility in society as a whole. Yet some of these empirical findings suggest that these assumptions are not entirely appropriate. In fact, Becker and Tomes (1986) offer a theoretical rationale for non-linearities in the degree of intergenerational earnings mobility across the parental earnings distribution that is based upon credit constraints. And nonlinearities have in fact been uncovered for some countries with data of appropriate size and quality, though not necessarily corresponding to the theoretically predicted patterns (Bratsberg *et al* 2006, Corak and Heisz 1999, Grawe 2004, Hertz 2005, Hyson 2003).[1]

There seems, however, to be little emphasis in this work on the structure of labour markets, the constraints or barriers embedded in them, and access to particular occupations or jobs. This has been a longstanding concern in the sociology literature, which focuses on the intergenerational transmission of occupations and socio-economic status, as for example in Morgan, Gursky and Fields (2006). In fact, studies of the demand side of the labour market describe persistent differences in wages across firms and industries. Krueger and Summers (1988) discuss inter-industry wage differences in the United States and suggest that it is difficult to attribute persistent differentials to worker-specific traits. In contrast, Abowd, Kramarz and Margolis (1999) use firm level data for France and find that while firm specific effects are not unimportant, the distribution of workers explains a large part of inter-industry and firm-size wage

[1] Grawe (2004), Grawe and Mulligan (2002), Han and Mulligan (2001) point out that with heterogeneity in child abilities and parental altruism the relationship between parental income and being credit constrained is not straightforward and cannot be easily determined empirically.

differences. In general, these studies and an associated literature documenting within industry firm differences, as for example in Baldwin (1998), suggest that more productive and more highly-paid workers are concentrated in particular firms.

In this context it may be reasonable to ask what determines access to particular firms, and what role this plays in determining generational earnings mobility and any nonlinearities in this relationship. It is well established that on the supply side families and friends are important in the job search process. Granovetter (1995) is an often cited source documenting this in a small scale survey for a particular labour market, but the patterns are well established in nationally representative surveys with Loury (2006) suggesting that up to 50% of jobs in the U.S. are found through family, friends or acquaintances. Ionnides and Loury (2004) offer a detailed survey and document the extent of this sort of networking, while Grenon (1999) reports that for Canada about one-quarter of successful job searches involve family or friends. Though the impact of using family and friends to find a job on the wages that are subsequently earned is sometimes found to be positive and sometimes negative, Loury also shows that the highest wages are paid to those who find jobs through "prior generation male" relatives who actually knew the potential employer or served as a reference. In this US study roughly 10% of men found jobs in this way. Kramarz and Skans (2007) are even more specific concerning the nature of the contacts, pointing out that there is a high tendency for young adults in Sweden to find their first job in the same plant that employs their parent.

At the same time there is also a literature on the intergenerational transmission of employers and occupations motivated less by job search theory than by models of firm or sector specific human capital investments that parents make in their children. The focus

in this literature is on certain sectors, particularly the farming sector where the development of very specific skills and knowledge among children plausibly implies that they will be more productive by inheriting the family farm than by working on other farms or in other sectors. For example, Rosenzweig and Wolpin (1985) develop an overlapping generations model of this sort to explain how returns to land-specific experience leads children in developing countries to work on the family farm and to acquire it in adulthood. But the idea has also been applied to agriculture in rich countries as in Kimhi and Nachlieli (2001), Laband and Lentz (1983), and McNally (2003), and also to the tendency of the sons of doctors, lawyers, and the self-employed to be employed in the same occupations as their fathers (Laband and Lentz 1992, Lentz and Laband 1990, 1989). The interpretation of this process, however, is still open, with Polacheck (1986) not excluding the role of nepotism.

Informative as this literature is, it remains addressed to specific sectors and professions and has not been empirically examined at an economy-wide level. As such, the importance of these patterns at a broader level remains unclear. The possible exception to this is the study by Kramarz and Skans (2007). While their research may be more readily interpreted in the context of job search theory as it focuses on the first job that young adults find, it may also relate to the idea of firm specific human capital investments if the patterns were to hold over a longer horizon with the first job leading to a career job. But this remains to be documented.

The connection of both of these perspectives to the literature on intergenerational mobility has not been explicitly examined. To the best of our knowledge the transmission of employers across generations has been mentioned in only two studies. Shea (2000)

hypothesizes that fathers in unionized jobs are able to pass on employment with the same firm to their sons. Further, the union-non union wage premium implies that the children of these relatively higher earning fathers will also get a relatively higher wage offer from the firm. Atkinson, Maynard and Trinder (1983) also note that this tendency will depend more generally upon the diversity of the local labour market and the hiring practices of firms. In their study of intergenerational earnings mobility in the city of York the local labour market was dominated by a single employer, making it more likely sons would be employed at the same firm as fathers and more likely that the firm, even in a non-unionized setting, will adopt a preferential hiring practice of this sort. Further, this being a dominant or large employer in the labour market may also suggest a dominant position in product markets so that the firm's revenues and hence wage setting policies may incorporate a rent that is shared with workers. This said, the idea that the intergenerational transmission of employers may be part of the process determining the intergenerational transmission of earnings has not been used to motivate in-depth analysis.

2. Nature of the data

In order to pursue an analysis of this sort we use two complementary definitions of what it means to be employed by the same firm as one's parent. These are meant to encompass the two different perspectives on this issue. The first is a very broad measure indicating whether an adult currently works or worked at any point in the past with the same employer that had also at some point employed his father. We present this measure to capture the influence of parental networks on the child's job search. The second

definition is more specific, referring to whether the individual's main employer in adulthood is the same as the main employer the parent had during the child's teen years. It is intended to measure outcomes from firm-specific investments or hiring processes that favour the children of employees. We use both of these to relate the transmission of employers across generations to the transmission of earnings.

To do this we use a large administrative data bank for a cohort of young Canadians. Our analysis is based upon the Intergenerational Income Data (IID) developed at Statistics Canada from administrative information on individual income tax returns that have been grouped into families. Canadians file their income tax returns (referred to as T1 Forms) on an individual basis, and Statistics Canada has grouped these into families using a variety of matching strategies that are described in Harris and Lucaciu (1994). The resulting T1 Family File (T1FF) is the basic building block for the creation of the IID, an intergenerational linked set of T1 Forms for a series of cohorts of young men and women, and their mothers and fathers. This represents not quite four million individuals and their parents, and in particular 1.9 million men who are the starting point for our research. We focus on the male cohort born between 1963 and 1966, and in fact for the most part the oldest subset born in 1963. These individuals are linked to their fathers—not necessarily their biological fathers—if they filed an income tax return between 1982 and 1986 while still living at home. This is required to ensure that a parent-child match is made, and also that the child has an observed Social Insurance Number (SIN), a unique individual identifier that can then be used to link all subsequent T1 Forms which contain information on earnings. These T1 Forms are available for all years between 1978 and

1996.[2] The sample sizes associated with the creation of our analytical files are detailed in Appendix Table A1, which makes clear that they are large—measured in the tens and hundreds of thousands—given that the data potentially represent the universe of individuals in these age groups.

Versions of these data have been used by Blanden (2005), Corak (2001), Corak, Gustafsson, and Österberg (2004), Corak and Heisz (1999), Grawe (2006, 2004), and Oreopoulos (2003) to study a host of issues dealing with intergenerational mobility. Our use of the data is closest to that of Oreopoulos, Page and Stevens (2008) who represent the only other application that uses information on the specific firms employing parents. The information on employers is developed from a longitudinally consistent catalogue of all enterprises in the country, and linked to individuals through the earnings remittance forms issued to employees (the T4) and used to support their income tax returns. This database of firms is referred to as the LEAP.[3] Each T4 has a payroll deduction account number unique to a firm, and the LEAP serves to aggregate the possibly many account numbers per firm into a single longitudinally consistent identifier. For each individual (fathers and sons), and for each year from 1978 to 1996 we obtain unique firm identifiers for up to four employers. Very few individuals ever have more than four different employers in any given year. Using the individual's earnings from each employer we

[2] The algorithm used to create the data leads to an under-representation of children from lower income backgrounds, and from the major metropolitan areas: Montreal, Toronto, and Vancouver. This reflects the fact that children who leave home early or who otherwise are not engaged in the labour market while at home are less likely to be linked to a parent. It also reflects the fact that new immigrants and their children will be under-represented in the data, the majority having a tendency to settle in the three major cities of the country. Corak and Heisz (1999), Oreopoulos (2003), and Oreopoulos, Page and Stevens (2005) all explore the nature of this under-reporting and find that it does not play a role in biasing their analytical results. We note that weights based upon Census data have been created to account for the under-reporting, and our analysis uses them throughout even though they make no difference to the results.

[3] The acronym refers to Longitudinal Employment Analysis Program. See Statistics Canada (1992, 1988) for a description of its construction and use.

designate for a given year the firm accounting for the majority of total earnings as the "main" employer in that year, or sometimes over a five year horizon according to our analytical needs.[4]

The LEAP offers an accurate representation of the private sector but our analysis of the intergenerational transfer of employers is hampered by the fact that it does not distinguish separate employers in the public sector.[5] For anything finer than a two digit industry analysis this will overstate the degree to which employers or industries are passed across the generations. In order to recognize this we produce a set of results for two separate definitions of whether there is a match of employers between fathers and sons: one in which employment in the public service for both the father and son is considered to represent same firm employment, and one in which it is considered to be missing information on same firm employment. In fact, the findings did not vary significantly in kind, though there are differences in some of the descriptive results, with the former definition leading to a higher incidence of intergenerational transmission of employers. In what follows we report the results that consider such observed matches to be missing information, and as a result note that the analysis offers conservative estimates of the degree of intergenerational job contacts.

Table 1 presents basic descriptive information. Father's earnings are averaged over the five year span in which the son was 15 to 19 years of age. To remain in the

[4] For example, the father's top four employers over the period the son was 15 to 19 years of age account for 97% of all earnings. The main employer represents 85.5% of total paternal earnings; the second employer accounts for a further 8.3%; the third for 2.0% and the fourth for only 0.7%. In the case of sons virtually all earnings are accounted for by the top four employers. The main employer during the four years between the ages of 30 to 33 accounts for 94.8% of all earnings, the second for 4.5%, and the third and fourth for only 0.53% and 0.09% respectively.

[5] This refers to the federal and provincial public services but not to municipal governments.

sample the father must have positive earnings in each of these five years and must have been born between 1908 and 1952 inclusive.[6] On average fathers are in their mid forties when we estimate their permanent earnings. This corresponds roughly to the phase in the life cycle suggested by Haider and Solon (2006) to make these calculations in their analysis of the US Panel Study of Income Dynamics. Sons' earnings are averaged over a three year period, 1994 to 1996, conditional on reporting positive earnings in each of these three years. As such the sample of sons is relatively young. This is likely to lend a downward bias to estimates of the intergenerational earnings elasticity, and for this reason we focus most of our analysis on the oldest cohort available to us (those who are 33 years old at the end of the sample period). Some of the descriptive results suggest that this is not likely to influence the degree of intergenerational transmission of employers. This restriction also simplifies many of the calculations and makes the sample size—at just over 70,000—more manageable.

3. Definitions of the intergenerational transmission of employers and some implications

Of the two alternative definitions of whether or not a son is employed by the same firm as his father the first is the broader measure. According to this measure the son is said to have the same employer as his father, during any given year from the age of 16 onward, if the father was also employed by this employer at any point in the past, as far back as the son's 15th year. In order to create this variable we define a vector of time-varying

[6] This is the preferred sample selection rule in Corak and Heisz (1999). They show that averaging over a five year horizon is long enough to correct for transitory earnings fluctuations. Mazumder (2005) suggests that almost twice as many years are necessary to correct for persistent transitory earnings fluctuations in the US administrative data he uses. However, unlike these US data the earnings information from the IID is not top coded.

same-employer indicators that are set equal to one in year *t* if any of the son's employers in year *t* were the same as any of the father's employers over the period 1978 to *t-1* inclusive. This definition of the intergenerational transmission of employers involves up to four different employers per year for both sons and fathers. At age 33 it can be used to determine the life time incidence of the intergenerational transmission of employers showing whether the son at any point since the age of 16 had the same employer as his father.

As such it relates all the employers with which the father has direct knowledge by virtue of having at some point worked with them, to all the employers the son ever had. Our starting point is to interpret the observations on this variable as the presence of an intergenerational network. There will be an understatement built into this for a number of reasons. Firstly, fathers may have direct knowledge of firms, their locations, hiring practices, and the chances their sons may obtain an offer that does not depend upon having been employed with them. Second, the network upon which the son may rely extends beyond his father to other relatives, including potentially those of his father-in-law. Finally, it should also be noted that the son may never have been employed at any of the firms that ever employed his father even though the network exists and he may have had the opportunity. On the other hand, this life-cycle measure of same-firm employment may overstate the breadth of the father's network in the sense that the son could have found the job without relying upon the father.

In what follows we address some of these concerns through appropriate estimation methods, but the reason for the focus on this indicator of the father-son relationship is to develop a measure of the capacity of parents to invest in their children

through non-monetary mechanisms later in the child's life. As such, the fact that the network upon which the child may rely extends beyond the relationship with his father is not of central concern. The intention is to assess the specific role of parents in guiding their children's interaction with the labour market. This is seen as a complementary mechanism to the almost exclusive focus on early childhood investments in the current literature on intergenerational dynamics. If at some point in the child's working life-cycle we observe the intergenerational transmission of employers this is a signal of the parent's capacity to play this role, and to make these and other related types of investments in the child.

If children are able to rely upon the intergenerational transmission of employers in this sense, then for two sons of equal ability, and who therefore face the same job offer distribution, we expect from basic job search theory to observe the following patterns. The first has to do with the fact that the rate of job offers may differ across these two groups of children. The inclination is to think of parents as having direct control over the chances that their children will receive a job offer. In this context it may be more likely to observe the intergenerational transmission of jobs from fathers who are self-employed as examined by Lentz and Laband (1990). In a similar way fathers with higher earnings, and therefore possibly more autonomy and influence in the workplace, may also increase the likelihood their employers will extend a job offer to their sons.

In addition, it may be that the influence of parental job contacts works through the child's reservation wage. For a given job offer distribution the availability of a job in the father's firm, something the child would know with certainty, will lead to higher reservation wages in the same way that the availability of an independent source of

income like unemployment insurance increases the reservation wages of the unemployed. If this is the mechanism we need not observe the child being employed in the same firm as his father in order for this possibility to influence labour market outcomes. A job offer of any value from a parent's firm will influence the child's actual wage as long as it is greater than the lowest possible offer the son could receive elsewhere. Individuals able to rely on the fact that they can obtain employment with their parent's firm sample a conditional job offer distribution and they will earn higher wages than an equally qualified individual without job contacts who samples an unconditional distribution.

This perspective also generates at least one further testable hypothesis concerning the incidence of same firm employment. If it is the case that the value of the job offers for the son in the father's firm is positively associated with the father's income then children with higher earning fathers will have higher reservation wages.[7] Consequently, the incidence of same firm employment should increase over the father's earnings distribution, being very high for children of the highest earning fathers. This pattern will be nonlinear for any job offer distribution with a central tendency. At the very top of the parental earnings distribution it is much more likely that employers are passed on across the generations since it is very unlikely that children will be able to find a higher valued

[7] In a standard job search model with infinite horizons, no search costs, and exogenous job offer arrival rates the reservation wage is defined as $W^R = Z + \frac{\omega}{\rho}\int_{W^R}^{\infty} \overline{F}(W)dW$ where Z is the value of non-wage income, ω is the job offer arrival rate, ρ is the discount rate, and $\overline{F}(W)$ is the survivor function associated with the density of the job offer distribution. This implies $\delta W^R/\delta Z = 1 / [1 + \omega \overline{F}(W^R) / \rho] > 0$. See Lancaster and Chesher (1983, pp. 1664-65). The discussion in the text treats Z to be the value of the job offer from the father's employer and this result would continue to hold if $\delta F(W)/\delta Z = 0$, that is if a marginal change in one firm's wage does not change the distribution over all firms.

job offer elsewhere when their father's are working for the highest paying firms in the economy.[8]

All of this assumes that the job offer distribution is the same regardless of whether or not the son can rely upon an offer from his father's firm. Our second measure of the intergenerational transmission of employers is meant to capture the notion that specific human capital investments made early in a child's life may alter the job offer distribution, being higher in certain firms or sectors than others associated with the father's place of work. This requires a longer term focus and for this reason we examine the intergenerational transmission of the main employer the father had during the son's teen years and the main employer of the son in adulthood. One implication of the model is a particular life cycle pattern in the incidence of same firm employment reflecting shifts in the job offer distribution as the son accumulates specific and general human capital. Before the child completes formal schooling or obtains significant work experience and on-the-job training the wage offer distribution he faces will have a low mean. It is much more likely that any firm-specific skills the father passes on will imply higher returns to working in the same firm, and the incidence of same-firm employment will be high. As the son's general human capital increases through the completion of schooling, the job offer distribution faced from other employers shifts to higher and higher wage rates. This pattern will depend upon the optimal level of the child's human capital, being more evident for high ability children in the sense of Becker and Tomes (1986). Their higher

[8] To continue with the notation of the previous note, $Z > 0$ does not mean the individual is necessarily employed with the same firm that employed the parent, that probability being simply $F(W^R)$, where $F(\ )$ is the associated cumulative distribution function. If $F(W^R)$ increases monotonically in value with Z the incidence of same firm employment is higher. The probability of same firm employment approaches one at the highest possible values of W^R, and if it is the case that Z increases monotonically with parent's earnings this implies a much higher chance of same firm employment among the sons of highest earning parents.

endowment may imply higher optimal levels of general human capital that may then raise the return to options other than the father's employer or sector with a consequent fall in the incidence of same firm employment.

4. The incidence of intergenerational transmission of employers

The data suggest that there is in fact a high "life-time" incidence of intergenerational transmission of employers, clearly indicating the presence of parental networks supporting the labour market trajectories of children. By 33 years of age just over 40% of sons are employed, or have been employed, at an employer that had at one time also employed their fathers. These results are presented in Figure 1, illustrating the proportion of sons who at any give age ever worked for an employer that at some point also employed their fathers. This is a cumulative variable that can only increase with time. At 33 years of age 41% of Canadian men were working, or worked at least once between 1978 and 1996, for an employer who had at some point employed their fathers.

The rate of increase in the incidence of same firm employment slows significantly after about age 25, and is relatively flat after age 30. This reflects a particular life cycle pattern, one that is roughly in accord with the pattern of human capital accumulation, and the predictions discussed in the previous section. The intergenerational transmission of employers is highest in the early stages of the life cycle as individuals are making the transition from formal schooling to work, with the largest changes occurring between the ages of 18 and 22. It increases from less than 10% to 30% during the teen years, and then rising more slowly to 40% during the 20s. This is more explicitly illustrated in the two panels of Figure 2, which offers the life-cycle patterns for three alternative definitions of

the father's job contacts. The focus is on the current employer of the son rather than on life-time incidence. In Panel A the reference is to any employer the father held in previous years, while in Panel B it is to the father's main employer in the previous year, and also to his main employer when the son was 15 to 19 years of age. These parental contacts are related to any of the son's current jobs, and to the son's current main job. In all five possible cases the highest incidence of intergenerational employer transmission occurs between the ages of 18 to 22, when some sons have finished formal schooling while others are engaged or just completing their post-secondary schooling.

The two measures of particular interest, those discussed in the previous section, are the top line in Panel A and the bottom line in Panel B. The other series help to fill out the story. Panel A illustrates that 16 to 18% of sons in each of their earliest adult years work for an employer their fathers had also worked for at some point in the past. At the age of 33 this percentage is significantly lower but still important at just above 10%. Indeed, at this age just under one-in-ten also have as their current main employer an employer for which their fathers had worked at some point in the past. In other words, for 10% of the individuals in our sample the main adult employer, and hence the main source of earnings, is based upon an intergenerational contact. This result is similar to that by Loury (2006) for the United States.

While this information suggests that the father's overall contacts are important, the information in Panel B illustrates that a large part of this has to do with the father's direct contacts: that is, with the father's main employer in the previous year, and particularly the father's main employer during the son's teen years. At the age of 20 years

just under 15% of sons are employed with the father's main employer of the previous year, and about 10 to 12% have as their current main employer the father's main employer of the previous year. These proportions fall off as sons get older, but remain around five to six percent at the age of 33. In fact at the age of 30 and beyond the main employer of the son is more likely to be the same main employer the father had during the son's teen years than it is the main employer the father had in the previous year, likely reflecting changes in employment patterns among fathers at the later stages of the life cycle. The fact that direct contacts play the large part of the role in determining these life cycle patterns suggests that there is full information available to the sons about the possibility of obtaining employment from the firm playing the major role in determining the father's earnings. Further, for between 5 and 6% of our sample the main employer in adulthood is the same as the main employer the father had when the child was a teen. In other words, on the basis of this representative cohort the possibility for a firm-specific human capital explanation of intergenerational transmission of employers in the manner of Rosenzweig and Wolpin (1985) exists for about one in twenty men.

Furthermore, the data reveal that higher parental income is associated with a higher likelihood of intergenerational transmission of employers, and more specifically with distinct nonlinear patterns. Figure 3 illustrates, for this particular age group of sons, how the underlying proportions with same-firm employment change over the percentiles of the parental earnings distribution. Overall the life-time incidence of same firm employment is 41% in these data, as given by the last observation in Figure 1. However, there is a clear nonlinear relationship across the father's earnings distribution. At earnings percentiles below the 70^{th} the incidence of same firm employment is only once above

45%, hovering for the most part below 40%, though higher at the 15th and lower percentiles. At or above the 85th percentile it is above 45% 10 times, and always above the average. The proportion of sons employed at some point with the same firm that at some point also employed their fathers rises noticeably after this point, and then again sharply after the 95th reaching 55% at the second highest percentile and almost 70% among the children of fathers in the top percentile.

Figure 4 offers a similar presentation using the narrower definition of same firm employment: main employer at age 33 matching the father's main employer when the son was 15 to 19 years of age. The overall incidence of same firm employment is 5.7%, but there is a clear positive tendency in this percentage across the father's earnings distribution with the highest proportions within the top 5%, and particularly the top percentile where 15% of sons have the same main employer their father had some 15 to 20 years earlier.

4. Linear probability models of intergenerational transfer of employers

We explore these patterns in more detail using, as a starting point, a series of linear probability models of same firm employment. The dependent variables are 0-1 indicators of the two measures discussed in Figures 3 and 4, reflecting overall averages of 41% of those aged 33 having at some point worked for an employer that at some point also employed their fathers, and 5.7% having as their main employer in adulthood the same main employer their fathers had some 15 years earlier. Based upon our theoretical discussion we consider two sets of variables that may influence the chances a son has at some point worked for an employer for which his father has also worked: the individual

characteristics of the father; the characteristics of the firm. The definition of these and associated descriptive statistics are presented in Table 2.

The natural logarithm of father's earnings and earnings squared are included to capture the patterns illustrated in Figures 3 and 4, while age and age squared are used to control for life-cycle differences. The number of employers the father had over a ten year period is intended to indicate both the extent of the network the son may draw upon, and also the father's reputation. If the father has worked with many firms then this may imply a higher likelihood the son will be employed at a firm that also employed the father: there is simply a wider set of contacts upon which the son may draw. However, as the number of employers increases it may also signal a less reliable reputation. If it means, for whatever reason, that the father is not able to keep a stable job, then it may well be that past employers are less likely to hire his son. As such we can expect a non-linear pattern in this measure, and therefore also include the square of the number of firms. On average fathers have 2.8 jobs over a ten year period, but the standard deviation at 2.9 is actually a bit higher than the mean. When the focus is on the generational transmission of firm-specific skills we would expect this variable to be negatively related to the probability that the son's main employer in adulthood would be the same as the father's. The more employers the father has the less likely he is in a workplace relationship of stability with specific skills that can be passed on to the son.

The model also includes a series of 0-1 indicator variables for the presence of non-zero self-employment income over a five year period, be it from fishing, farming, professional, or from other more common sources of self-employment associated with incorporated or unincorporated businesses. These variables offer an indication of the

degree of control the father has over the firm's hiring practices. It should be noted that our analysis is based upon parental earnings, not total income. These indicator variables are derived from income tax declaration of other sources of income, and may also imply that the fathers total market income is not the same as total earnings. The amount of self-employment income could be positive or negative, our concern not being with the amount but with the possibility that the father may have direct control over hiring practices. The most common situation is one in which we would expect the individual to have the most control over hiring, having some income from self-employment. About 11% of fathers are in this situation. This indicator of the presence of self-employment income is also interacted with the natural logarithm of father's earnings and earnings squared.

In order to hold constant the diversity of the employment prospects of the son we include a series of region indicators of where the father lived in 1986.[10] In a large city sons may have more employment options and be less likely to be employed at the same firm, than in rural areas. These indicators are derived from the first two digits of the postal code, and offer information on rural and urban areas as well as provincial and sub-provincial regions.[11] Almost three-quarters of the observations are to be found in urban areas.

[10] In a small number of cases the postal code is missing in this year and we attempt to obtain it by referring to an earlier year, but back no further than 1982 when the postal code information begins to be reliably captured.

[11] The first digit of the postal code is a letter, which uniquely identifies a province with the exception of the larger provinces. Ontario is divided into five sub-regions, and Quebec into three. The second digit is a number that can be used to identify if the postal code refers to an urban or rural area. As such there are a total of 18 indicators for province/region, which in addition to the ten provinces includes two indicators for the three northern territories. An additional 0-1 indicator for rural/urban residence is also used. See www.canadapost.ca/personal/tools/pg/manual/PGaddress-e.asp for details.

If the firm goes bankrupt and no longer exists it is less likely that the employer will be passed on across the generations. However, more generally it is not just the death of a firm that will indicate the prospects of the son's employment, but also the firm's hiring policy. If the firm decides to shrink in size through attrition it may choose not to hire younger people at all. To capture this we define a 0-1 indicator if there are any 30 to 33 year olds in 1996 employed by the firm. If there is none then the variable "Firm Death" takes a value of 1, otherwise zero. For the sake of simplicity we chose only the father's main firm when the son was 15 to 19 years of age to define this variable. This indicates that 42% of cases the father's main employers were not in a position by the end of the period to hire the sons.

The firm size at the onset of the period is also controlled for using a series of indicator variables. This refers to the total number of father's in our data employed by the firms, and not therefore to the total number of employees.[12] About 50% of fathers are in the smallest category, with the next highest proportions in the larger categories: 14% and 12% in firms of more than 100 and more than 500 of these workers.

Finally, we include a number of characteristics of the two digit industry to which the father's main firm is classified: the employment growth over the period, the average years of education of all employees, an interaction of this later variable with the father's income, and indicator variables for the two-digit SIC. These capture the overall chances of employment, the educational requirements—the ability to meet them potentially varying with the father's earnings—and any industry specific differences in hiring practices such as the rate of unionization.

[12] Oreopoulos, Page and Stevens (2008) also use this variable and note that that it represents not quite one-tenth of actual firm size as indicated by the full LEAP database.

The results for a series of specifications are presented in Tables 3 and 4 for the two definitions of the dependent variable. The direction of the estimated effects all accord with our priors. The quadratic relationship between paternal earnings and the chances of same-firm employment is robust to the specification, and the particular parameter values suggest the relationship is parabolic being highest for sons from highest earning fathers. The relationship between the number of employers the father had and chances of same-firm employment is an inverted U-shape in Table 3, suggesting that increases in the number of employers the father had to a maximum of between 7 and 8 over a ten year period increases the likelihood the son will be employed at one of them. The pattern is the opposite when the focus is on the same main firm dependent variable in Table 4, with more paternal employers lowering the likelihood that the child will be employed in the same main firm of the father. Both of these patterns seem to be intuitively correct, with a larger number of employers indicating in the former case a wider set of contacts, but in the latter that the father may not have had a strong foothold in any particular firm and hence less likely to pass on any firm-specific capital to the son.

Of the four indicators of the type of income only the indicator for self employment income is consistently statistically significant, having the expected positive sign. Its magnitude, however, is much larger when the focus is on the network effect, suggesting that to the extent that self-employed fathers have control over workplace practices the major consequence is that they are more able to give their sons a job rather than a career job. The last specification in Table 3 indicates that this influence plays through the amount of earnings the father has, sharply raising the impact an extra percentage point of earnings has on the probability of intergenerational transmission of

employers. There is no such impact when the focus is on the main employer, the interactions not being statistically significant in column (6) of Table 4. Other forms of self-employment associated with agriculture and fishing are not statistically significant, nor is the indicator for the presence of professional income.

The personal characteristics of the father explain on their own not much more than 2% of the total variance in the data at best, but this rises four-fold once firm and industry characteristics are included in the analysis. The firm death variable is estimated to be negative, as is the indicator of urban residence. Finally, the use of the industry dummy variables seems to clarify the role of firm size, their inclusion indicating that sons are most likely to be hired in smallest larger firms. The most important results in these tables are the robust positive relationship with respect to father's self-employment income, and the nonlinear positive relationship between parental earnings and the probability of same firm employment.

5. Estimates of the intergenerational earnings elasticities

Based upon these findings our objective is to estimate the intergenerational earnings elasticity in a way recognizing that the population of sons consists of a mixture of two groups, those who have intergenerational job contacts and those who do not. We frame this as an endogenous switching regression model as described by Maddala (1986, 1983), and implemented by Lokshin and Sajaia (2004). Our use of this model is intended to account for the possibility that the decision to accept a job with the father's employer will be influenced by factors associated with the child's reservation wage and ability, and that these factors will also influence earnings. For example, fathers who are in a position to

support and guide their sons' labour market search through their job contacts may also have influenced the development of other characteristics such as motivation and aspirations at an earlier stage. However, this assumes that sample separation is known, but as we have already suggested our information probably lends itself more appropriately to a case in which the information about sample separation is imperfect. Some sons who are never observed to have been employed at a firm that once employed their fathers may still have their reservation wages influenced by the possibility that they could have such employment. Others who are observed to have had such employment could have found the employer on their own without relying on information or contacts from their parents. We leave to future work the estimation of this model as presented in Lee and Porter (1984).

In Table 5 we offer some preliminary least squares estimates of the intergenerational elasticity, meant to replicate earlier research and set the tone for the analysis. The results refer to the standard regression to the mean model used in this literature, namely $lnY_{i,t+1} = \alpha + \beta\, lnY_{i,t} + \varepsilon_i$ where lnY indicates the natural logarithm of permanent income, $t+1$ the son's generation and t the father's for family i, while α is a constant reflecting the earnings common to all individuals in the cohort of sons, and ε_i is a residual term. The objective of the exercise is to accurately estimate β, the intergenerational elasticity of earnings. This is what is offered in the table for a number of different samples. The overall estimate for all age cohorts of 0.226 is exactly in accord with other studies that have used these data and other Canadian data for this purpose, as reported in particular by Corak and Heisz (1999, table 3) and Corak (2006). But the table also shows a series of separate regressions for sub-samples according to whether the son

and father shared the same firm. This is for illustrative purpose, as it assumes that the sample separation into those who rely on a parental contact and those not able to is known, exogenous, and perfectly indicated by whether they actually worked for the same firm or not. The estimation results show that the sample of sons employed at the same firm as their father, whether this is defined in the broadest or narrowest sense, has an intergenerational earnings elasticity that is significantly higher. At the extreme when the analysis refers to the same main employer the estimate is 0.4, a value this high never being reported by any other Canadian study using a linear specification.

The issue of how the job search process, and in particular the parental influence upon it, impacts on the estimate of the intergenerational earnings elasticity is examined in Table 6. The first column repeats for reference the least squares results from panel 2b, column 2 of Table 5. This involves least squares estimation of a model using the entire data set of 33 year olds sons, but with each of the independent variables in the regression to the mean model being interacted with the 0-1 indicator of same firm employment. The remaining results are full-information maximum likelihood estimates using a probit model of same-firm employment based upon the specifications given in columns (3) to (6) of Table 3. These models use the full information in the data in a way that recognizes the son's wage as being endogenously determined through the network effect and the impact of parental earnings and other characteristics upon it. They should be contrasted with the least squares estimates in the first column.

The relationship between parent and child earnings is much tighter—the intergenerational elasticity being about 50% higher—among those sons who can rely upon their parents in structuring their job search. The estimate of the intergenerational

earnings elasticity for this group is about 0.3, compared to 0.2 for their counterparts who do not rely upon parental networks in finding a job. The results also suggest that the null hypothesis that the sample consists of two separate sub-groups cannot be rejected. This said the estimated intergenerational elasticity is not qualitatively different than what is obtained by least squares. According to this estimation strategy the assumption that that sample separation is known and exogenous does not lead to overly biased results. Table 7 offers a similar set of results for the second definition of same firm employment. The broad results are similar. The intergenerational elasticity is much higher among those with the same firm as their father, about 0.41 versus 0.23, and it does not change regardless of the specification of the model.

But previous research, notably Corak and Heisz (1999) and Grawe (2004), also shows that the linear regression to the mean model is mis-specified in these data. The IID offers a large number of observations of high quality earnings data and permits an assessment of whether the data generating function is nonlinear. We offer in Figures 5 and 6 an extension of the results in Corak and Heisz (1999) using non-parametric nearest-neighbourhood estimators, the most flexible technique available. We estimate this model for the sample of 33 year olds.[13] The intergenerational earnings elasticity is much higher throughout the father's earnings distribution for those sons ever having the same employer as their fathers. The presence of a job network works to increase the stickiness

[13] We are able to replicate the results in Corak and Heisz (1999) with the entire data set of all three age cohorts, those 30 to 33 years of age. These clearly indicate distinct non-linear patterns. The elasticity rises over the lower half of the father's earnings distribution from 0 at the very bottom and reaching just about 0.3 at the mean. It then falls in the upper half, before rising sharply at the very top of the father's earnings distribution. Our focus on just those 33 years of age indicates a similar pattern and magnitude, though rising above 0.3 at the mean, and without the sharp rise at the very top of the distribution. We attribute this difference to the fact that the nearest-neighourhood estimator is not as precise at the boundaries of the data set, with the reduced sample size playing a role as a few data points appearing in one data set but not the other changing the results.

of intergenerational earnings throughout the father's earnings distribution. In Figure 5 the intergenerational elasticity for this group never falls below 0.2, but for those not experiencing the intergenerational transmission of an employer it only reaches this value at its maximum. The elasticity is also closer to being linear, and therefore relatively higher at the lower and particularly very upper tails. In contrast, it tends to fall off throughout the lower and upper halves of the earnings distribution for sons not employed at the same firm as their fathers. This suggests that part of the preservation of earnings across the generations for the very top-earning fathers has something to do with the intergenerational transmission of employers.

All of this is particularly so in reference to the more narrow measure of same firm employment as illustrated in Figure 6. When the son has the same main employer as an adult that his father had 15 or so years earlier the intergenerational earnings elasticity is in the range of 0.5 when earnings are within two standard deviations below the mean. For the large part of distribution in the lower half of the earnings distribution the value is notably high at about 0.5 and relatively constant. This is in contrast to those not having the same employer as their father. The elasticity falls in the upper half of the distribution, but rises sharply beyond one standard deviation, reaching 0.8 at the very top (which is not shown in the figure).

6. Conclusion

Our analysis of generational mobility among a representative cohort of Canadian men links the degree to which earnings are passed on between fathers and sons to the degree to which they work for the same employer. We document the extent of the

intergenerational transmission of employers by deriving two related indicators, one relating to the job search process and the role of parental networks, and another related to the specific investments or control over recruitment that parents may have. We find that a large fraction of young men have been employed with an employer that also employed their father, and that this is related to a much higher transmission of earnings across the generations.

In the administrative data the intergenerational transmission of employers is higher among sons whose fathers have some degree of self-employment; higher among sons whose fathers have higher earnings, particularly at the very top of the earnings distribution; and higher early in the life cycle, during the teen years. Approximately 4 in 10 men have by the age of 33 worked at some point with an employer that had also at some point employed their father. Much of this intergenerational transmission of employers occurs during the teen years, but about 6% of 33 year olds have as their main employer the same employer their fathers worked for some 15 to 20 years earlier. These patterns are significantly more marked at the top of the earnings distribution. Close to 70% of the sons of top percentile fathers had at some point the same employer as their fathers, and for 15% their main employer at the age of 33 was the same employer their father worked for during their teen years. Fathers with evidence of self-employment are much more likely to pass on an employer to their sons, particularly during the early stages of the working life cycle. Self-employment also significantly tightens the relationship between parental earnings and intergenerational transmission of employers.

In addition to documenting these patterns we estimate a multivariate empirical model based upon a host of correlates associated with job search theory and firm-specific

human capital investment. This is of interest in its own right but also permits us to model the degree of generational earnings mobility recognizing a possibly endogenous process determining selection into separate regimes in which some sons are able to rely upon the intergenerational transmission of employers and others are not. We find that accounting for this possibility does not lead to estimates of the intergenerational earnings elasticity that are any different than a model of exogenous and known selection. The results suggest that the intergenerational elasticity is significantly higher among those fathers and sons who have shared an employer. In the extreme we report an intergenerational earnings elasticity of just over 0.4 when the sons have the same main employer in adulthood as their fathers, but only about 0.2 when they do not. We also document distinct non linear patterns between the two regimes with much higher elasticities in the lower half of the fathers earnings distribution at about 0.5, and also at the very top where it reaches 0.8.

The literature on the degree of generational earnings mobility is oftentimes linked to the growing research on early childhood development, the formation of values and preferences, and their impact on readiness to learn and pro-social behaviour that are important antecedents to educational attainment and ultimately labour market success. Our research suggests that it is also important to understand the nature of labour markets and the way in which young adults interface with them during the transition to adulthood, and ultimately in final career choices. Parents may also be in a position to influence this process by offering contacts and knowledge of employment with particular employers, and in the extreme exercising direct control. This may be an important complement to the non-monetary investments early in life that have shown to be important. The capacity of

parents to play in a child's transition to the labour market varies according to their place in the earnings distribution, and this may also be an important part of the explanation for the degree to which children have relatively similar earnings to their parents.

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Table 1
Descriptive statistics for fathers and sons linked intergenerational

	Number of observations	Average Age		Average Earnings		Number of unique employers	
		Fathers (1980)	Sons (1996)	Fathers	Sons	Fathers	Sons
1. All age cohorts	236,210	45.73 (6.37)	31.65 (1.10)	43,058 (29,016)	34,353 (23,131)	59,334	78,017
2. Oldest age cohort	71,215	47.35 (6.14)	33 (0.00)	43,524 (27,085)	36,129 (22,953)	23,991	31,729

Note: Panel 1 refers to all inter-generationally linked sons born between 1963 and 1966. Panel 2 refers only to those born in 1963, and who are hence 33 years of age in 1996. Fathers' earnings are averaged over the five years the son was 15 to 19 years of age, and sons' earnings are averaged between 1994 and 1996. All monetary figures are expressed as constant 1992 dollars. The number of unique employers refers only to the main employer, the employer that paid the largest proportion of total earnings during the above periods. Figures in parentheses are standard deviations.

Table 2
Descriptive information on variables used in modeling the incidence of intergenerational transmission of employers for a cohort of 33 year old men

	Variable definition and description	Mean	Standard Deviation
Dependent Variable			
Ever Same Firm	0-1 indicator of whether the son had by the age of 33 employment in any given year since the age of 16 with a firm that employed his father in any previous year	0.410	
Same Main Firm	0-1 indicator of whether the employer accounting for the majority of the son's earnings between at the age of 33 is the same as the employer accounting for the majority of the father's earnings when the son was 15 to 19 years of age	0.0568	
Father's Characteristics			
ln earnings ln earnings^2	Natural logarithm of 5 year average of father's earnings when the son was 15 to 19 years of age, and its value squared	10.6	0.514
Number of employers Number of employers^2	The number of different employers the father had over the ten year period 1978 to 1988, and its value squared	2.83	2.87
Farming income	Presence of non zero income from farming at least once over a five year period	0.0573	
Fishing income	Presence of non zero income from fishing at least once over a five year period	0.00437	
Professional income	Presence of non zero professional income at least once over a five year period	0.0156	
Self employment income	Presence of non zero income from other sources of self-employment over a five year period	0.112	
Age Age^2	Average age during the years the son was 15 to 19 years old, and its value squared	47.3	6.13
Firm and industry characteristics			
Province / Region	A series of 18 indicator variables of the region of father's residence derived from the first digit of the postal code. These are provinces with the exception of Ontario, which is divided into 5 sub-provincial regions, and Quebec, which is divided into three. Metropolitan Toronto serves as the omitted category in the estimations.		
Urban	A 0-1 indicator of whether the father lived in an urban area as indicated by a non-zero value for the second digit of the postal code	0.729	

Firm Death	An indicator of whether the father's main employer when the son was 15 to 19 employed at least one person 30 to 33 years of age between 1994 and 1996	0.424	
Firm Size 1 to 10 Firm Size 11 to 20 Firm Size 21 to 50 Firm Size 51 to 100 Firm Size 101 to 500 Firm Size 501 and more	Indicator variables of the total number of employees of the father's main employer during the years the son was 15 to 19 years of age. The largest category serving as the reference in the estimation.	0.497 0.071 0.103 0.070 0.142 0.117	
Industry employment growth	Difference between the natural logarithms of the total employment in the 2-digit industry of the fathers main employer in the1981 and 1996 Census of population	0.0584	0.199
Average years of schooling by two digit industry	Average years of schooling of all employees in the 2 digit SIC 1980 industry of the fathers main employer in the 1996 Census of population	12.3	1.25
Two digit industry indicators	A series of 75 indicator variables for the 2-digit SIC 1980 industry of the father's main firm when the son was 15 to 19 years old		
Interactions			
ln earnings × years industry average schooling			
ln earnings × Self-employment income			
ln earnings^2 × Self-employment income			

Table 3
Estimates of linear probability models for same firm employment by fathers and sons: oldest cohort, ever employed at the same firm as father

	(1)	(2)	(3)	(4)	(5)	(6)
Father's Characteristics						
ln earnings	**0.037**	**-1.14**	**-0.961**	**-0.649**	**-0.486**	**-0.732**
ln earnings^2		**0.0563**	**0.0485**	**0.0459**	**0.0432**	**0.0556**
Number of employers			**0.0189**	**0.0064**	**0.0074**	**0.0073**
Number of employers^2			**-0.00085**	**-0.0005**	**-0.0005**	**-0.0005**
Farming income			0.01023	-0.0163	-0.0167	-0.0163
Fishing income			0.00503	0.0330	0.0357	0.0335
Professional income			**-0.0829**	-0.0060	-0.0154	-0.0153
Self employment income			**0.0594**	**0.0468**	**0.0483**	**-3.255**
Age	**0.0119**	**0.0121**	**0.0125**	**0.0133**	**0.0144**	**0.0143**
Age^2 / 10	**-0.0018**	**-0.0019**	**-0.00184**	**-0.0018**	**-0.0020**	**-0.0019**
Firm and industry characteristics						
Firm Death				**-0.055**	**-0.063**	**-0.0625**
Firm size 1 to 10				**0.252**	**0.087**	**0.088**
Firm size 11 to 20				**0.171**	-0.00239	-0.00188
Firm size 21 to 50				**0.183**	0.00283	0.00275
Firm size 51 to 100				**0.166**	-0.00798	-0.00827
Firm size 101 to 500				**0.102**	**-0.0367**	**-0.0375**
Industry employment growth				**0.133**	**0.157**	**0.154**
Average years of schooling by two digit industry				**0.118**	**0.235**	**0.237**
Urban				**-0.061**	**-0.0571**	**-0.0568**
Province / Region – number of indicators				19	19	19
Two digit industry indicators– number of indicators					75	75
Interactions						
ln earnings × years industry average schooling				**-0.017**	**-0.0258**	**-0.0260**
ln earnings × Self-employment income						**0.683**
ln earnings^2 × Self-employment income						**-0.0350**
Constant	-0.125	**5.98**	**4.91**	**2.56**	**1.11**	**2.30**
R^2	0.0080	0.0117	0.0160	0.0785	0.1010	0.1017

Note: The dependent variable is defined to be a 0-1 indicator with the value of 1 indicating that the son was at employed at some point since the age of 16 with a firm that at some point in the past also employed his father. The analysis is based upon 70,982 33 year old men, and information on their fathers. **Boldface** indicates results with t-statistics above 1.96, the analysis being based upon sample weights and robust calculations of standard errors. The coefficient on the presence of farming income in models (4), (5), and (6) is statistically significant at the 10% level.

Table 4
Estimates of linear probability models for same firm employment by fathers and sons: oldest cohort, main firm same as father

	(1)	(2)	(3)	(4)	(5)	(6)
Father's Characteristics						
ln earnings	**0.0283**	**-0.191**	**-0.317**	**-0.244**	**-0.237**	**-0.268**
ln earnings^2		**0.0105**	**0.0159**	**0.0172**	**0.0174**	**0.0189**
Number of employers			**-0.0205**	**-0.0128**	**-0.0128**	**-0.0128**
Number of employers^2			**0.00082**	**0.00047**	**0.00045**	**0.00045**
Farming income			0.00036	-0.0018	-0.0014	-0.00115
Fishing income			-0.0161	-0.0131	-0.0093	-0.00949
Professional income			-0.0281	-0.0063	-0.0056	-0.00576
Self employment income			**0.0072**	**0.0054**	**0.0055**	-0.5683
Age	0.00023	0.00019	-0.00036	0.00012	0.00011	0.00014
Age^2 / 10	-0.00007	-0.00001	-0.00013	-0.00015	-0.00015	-0.00015
Firm and industry characteristics						
Firm Death				**-0.144**	**-0.150**	**-0.151**
Firm size 1 to 10				**0.0856**	**0.0392**	**0.0393**
Firm size 11 to 19				**0.0244**	**-0.0182**	**-0.0182**
Firm size 21 to 50				**0.0180**	**-0.0263**	**-0.0264**
Firm size 51 to 100				**0.0140**	**-0.0273**	**-0.0273**
Firm size 101 to 500				**0.0149**	**-0.0240**	**-0.0240**
Industry employment growth				**0.0733**	**0.0137**	**0.0137**
Average years of schooling by two digit industry				**0.0598**	**0.0836**	**0.0846**
Urban				**-0.0109**	**-0.0127**	**-0.0127**
Province / Region – number of indicators				19	19	19
Two digit industry indicators – number of indicators					75	75
Interactions						
ln earnings × years industry average schooling				**-0.0079**	**-0.0090**	**-0.0090**
ln earnings × Self-employment income						0.108
ln earnings^2 × Self-employment income						-0.0051
Constant	**-0.216**	**0.926**	**1.71**	**1.07**	**0.90**	**1.05**
R^2	0.0048	0.0054	0.0209	0.0875	0.0998	0.1000

Note: The dependent variable is defined to be a 0-1 indicator with the value of 1 indicating that the son's main employer between 30 and 33 is the same as the father's main employer when the son was 15 to19 years of age. The analysis is based upon 70,074 33 year old men, and information on their fathers. **Boldface** indicates results with t-statistics above 1.96, the analysis being based upon sample weights and robust calculations of standard errors.

Table 5
Intergenerational earnings elasticities from least squares estimation of a linear regression to the mean model of intergenerational mobility

	Entire sample	Public service same firm missing
1. Pooled sample		
a. All age cohorts	0.226	0.226
b. Oldest age cohort	0.250	0.250
2. Sample separation by ever same firm		
a. All age cohorts		
Never had same employer	0.168	0.173
Had same employer at some point	0.283	0.285
b. Oldest age cohort		
Never had same employer	0.190	0.198
Had same employer at some point	0.310	0.310
3. Sample separation by same main firm		
a. All age cohorts		
Same main employer	0.207	0.207
Different main employer	0.394	0.409
b. Oldest age cohort		
Same main employer	0.233	0.233
Different main employer	0.405	0.413

Note: Table entries are least squares coefficient estimates based upon a linear regression to the mean model with the natural logarithm of son's earnings averaged over three years (1994 to 1996) as the dependent variable, and the natural logarithm of the five year average of father's earnings during the years the son was 15 to 19 years of age. The model also controls for the age and age squared of both the father and the son when appropriate. All estimates are statistically significant with t statistics all above 20. Sample sizes vary from a low of 4,266 to a high of 236,490.

The sample based on "public service same firm missing" refers to a subset of the entire sample in which father-son pairs whose "matching" employer is the federal or the provincial public service are omitted.

Table 6
Estimates of intergenerational earnings elasticities: least squares and maximum likelihood estimates of endogenous switching regression model, ever same firm

	Least Squares	Maximum Likelihood			
	(1)	(2)	(3)	(4)	(5)
1. No same firm regime					
ln earnings	**0.198**	**0.194**	**0.196**	**0.197**	**0.197**
Age	0.0042	0.000620	0.0031	0.0035	0.0033
Age^2 / 10	-0.0003	0.00101	0.0002	0.0002	0.0002
Constant	**8.12**	**8.12**	**8.11**	**8.11**	**8.11**
2. Same firm regime					
ln earnings	**0.310**	**0.317**	**0.310**	**0.307**	**0.307**
Age	0.0114	0.0136	0.0112	0.0107	0.0107
Age^2 / 10	-0.0009	-0.0012	-0.0009	-0.0008	-0.0008
Constant	**6.75**	**6.57**	**6.76**	**6.82**	**6.83**
3. Switching equation					
ln earnings		**-2.64**	**-2.12**	**-1.72**	**-2.41**
ln $earnings^2$		**0.133**	**0.142**	**0.139**	**0.173**
Number of employers		**0.0516**	**0.0190**	**0.0235**	**0.0233**
Number of $employers^2$		**-0.0023**	**-0.0014**	**-0.0015**	**-0.0014**
Farming income		0.0221	-0.0412	-0.0435	-0.0416
Fishing income		0.0157	0.0802	0.0923	0.0855
Professional income		**-0.198**	-0.0097	-0.0423	-0.040
Self employment income		**0.149**	**0.127**	**0.137**	**9.748**
Age		**0.0367**	**0.0404**	**0.0444**	**0.044**
Age^2 / 10		**-0.0052**	**-0.0054**	**-0.006**	**-0.059**
Firm Death			**-0.149**	**-0.171**	**-0.171**
Firm size 1 to 10 (Firm Size)			**0.755**	**0.240**	**0.242**
Firm size 11 to 20 (greater)			**0.542**	0.0018	0.0034
Firm size 21 to 50 (than 500)			**0.575**	0.0144	0.0144
Firm size 51 to 100 (as the)			**0.531**	-0.0135	-0.0142
Firm size 101 to 500 (reference)			**0.356**	**-0.097**	**-0.099**
Industry employment growth			**0.398**	**0.413**	**0.407**
Average years of schooling by two digit industry			**0.327**	**0.689**	**0.686**
Urban			**-0.160**	**-0.156**	**-0.155**
Province / Region – number of indicators			19	19	19
Two digit industry indicators – number of indicators				75	75
ln earnings × years industry average schooling			**-0.048**	**-0.074**	**-0074**
ln earnings × Self-employment income					**2.04**

ln earnings^2 × Self-employment income				**-0.104**
Constant	**12.1**	**8.30**	**4.45**	**7.90**
σ_0	**0.573**	**0.571**	**0.570**	**0.571**
σ_1	**0.575**	**0.570**	**0.571**	**0.571**
ρ_0	**-0.135**	**-0.106**	**-0.074**	**-0.082**
ρ_1	**0.151**	-0.010	-0.049	-0.056
log likelihood	-128 185	-125 336	-124 188	-124 155
Wald test of independent equations chi2 (1)	**52.22**	**19.29**	**8.51**	**10.86**

Note: The analysis is based upon 70,982 33 year old men, and information on their fathers. **Boldface** indicates results with t-statistics above 1.96. Columns 3, 4, 5 report maximum likelihood estimates of an endogenous switching regression model under the assumption the error terms are distributed as tri-variate normal. The maximum likelihood algorithm uses $ln\ \sigma_i$ and $atanh\ \rho_i = 0.5\ ln\ ((1+\rho_i)/(1-\rho_i))$ for i=0,1. The marginal significance level for the null hypothesis that ρ_1=0 in model 3 is slightly below 10%.

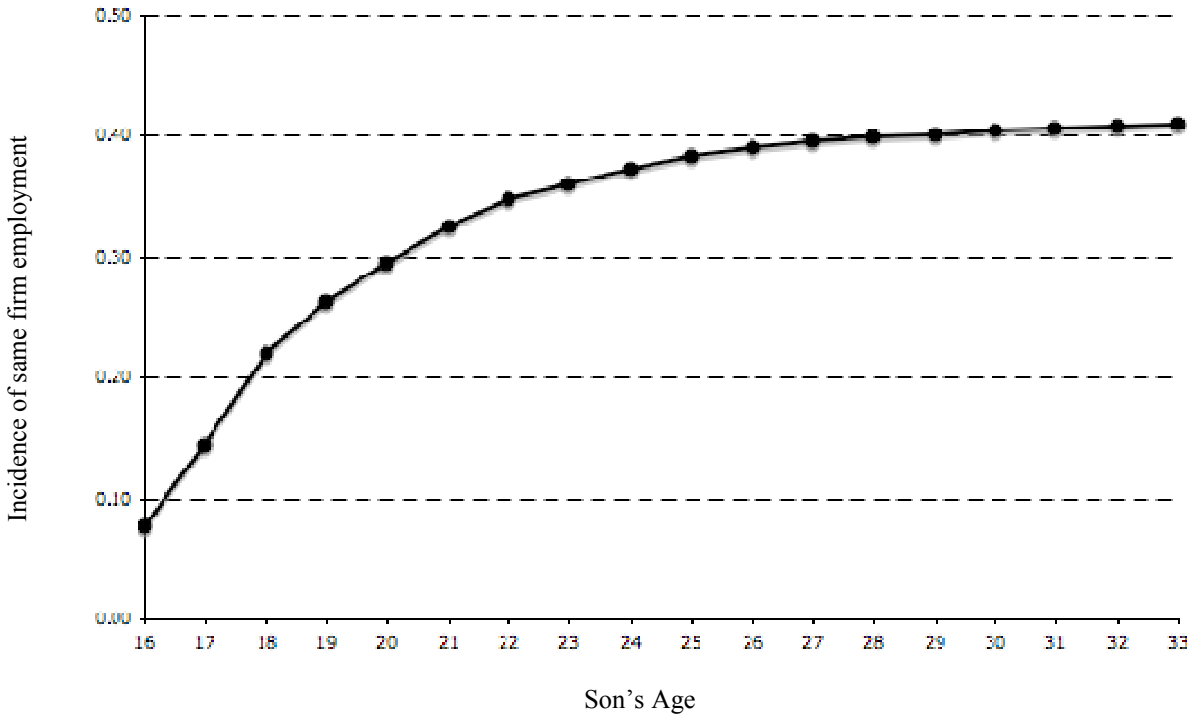
Table 7
Estimates of intergenerational earnings elasticities: least squares and maximum likelihood estimates of endogenous switching regression model, same main firm

	Least Squares	Maximum Likelihood			
	(1)	(2)	(3)	(4)	(5)
1. No same firm regime					
ln earnings	**0.233**	**0.230**	**0.234**	**0.233**	**0.233**
Age	**0.0101**	**0.0101**	**0.0101**	**0.0101**	**0.0101**
Age^2 / 10	-0.0009	-0.0009	-0.0009	-0.0009	-0.0009
Constant	**7.59**	**7.61**	**7.58**	**7.59**	**7.59**
2. Same firm regime					
ln earnings	**0.413**	**0.410**	**0.416**	**0.415**	**0.415**
Age	**-0.034**	**-0.034**	**-0.033**	**-0.033**	**-0.033**
Age^2 / 10	**0.004**	**0.004**	**0.003**	**0.004**	**0.004**
Constant	**6.92**	**7.02**	**6.85**	**6.90**	**6.90**
3. Switching equation					
ln earnings		**-1.98**	**-2.15**	**-2.05**	**-2.75**
ln earnings^2		**0.101**	**0.118**	**0.128**	**0.161**
Number of employers		**-0.264**	**-0.189**	**-0.190**	**-0.190**
Number of employers^2		**0.008**	**0.005**	**0.004**	**0.004**
Farming income		0.0138	0.0257	0.0357	0.0382
Fishing income		-0.221	-0.143	-0.116	-0.107
Professional income		**-0.243**	**-0.765**	-0.673	-0.072
Self employment income		**0.081**	**0.06**	**0.069**	**-10.68**
Age		-0.0018	-0.008	-0.010	-0.011
Age^2 / 10		-0.0015	-0.0023	-0.0027	-0.0027
Firm Death			**-2.14**	**-2.29**	**-2.30**
Firm size 1 to 10			**0.625**	**0.195**	**0.194**
Firm size 11 to 20	Firm Size		0.030	**0.339**	**0.340**
Firm size 21 to 50	greater than		**0.084**	**0.279**	**0.281**
Firm size 51 to 100	500 as the		**0.109**	**0.289**	**0.290**
Firm size 101 to 500	reference		**0.118**	**0.236**	**0.237**
Industry employment growth			**0.794**	0.105	0.103
Average years of schooling by two digit industry			-0.051	0.213	0.221
Urban			**-0.114**	**-0.136**	**-0.135**
Province / Region					
Two digit industry indicators					
ln earnings × years industry average schooling			-0.017	**-0.042**	**-0.043**

ln earnings × Self-employment income				**2.01**
ln earnings^2 × Self-employment income				**-0.094**
Constant	**8.92**	**11.89**	**10.88**	**14.47**
σ_0	**0.577**	**0.577**	**0.577**	**0.577**
σ_1	**0.446**	**0.447**	**0.460**	**0.446**
ρ_0	**-0.104**	-0.016	-0.009	-0.010
ρ_1	-0.059	**-0.248**	**-0.196**	**-0.195**
log likelihood	-88 520	-84 881	-84 210	-84 209
Wald test of independent equations chi2 (1)	**49.77**	**15.24**	**10.01**	**9.91**

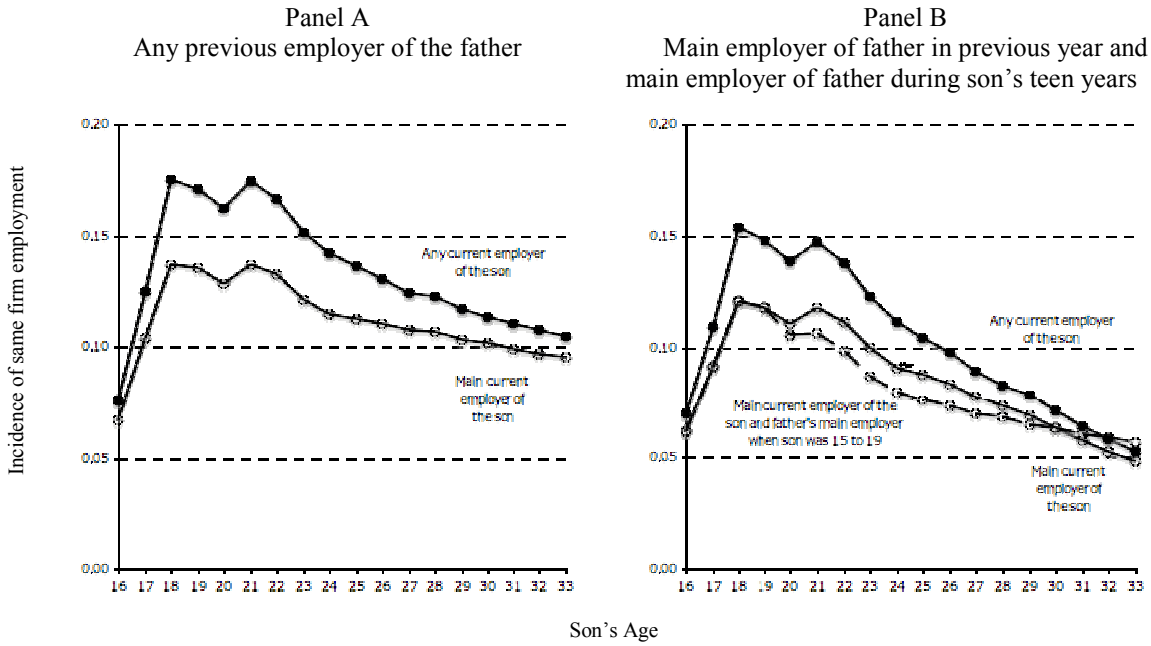
Note: The analysis is based upon 70,074 33 year old men, and information on their fathers. **Boldface** indicates results with t-statistics above 1.96. Columns 3, 4, 5 report maximum likelihood estimates of an endogenous switching regression model under the assumption the error terms are distributed as tri-variate normal. The maximum likelihood algorithm uses $ln\ \sigma_i$ and $atanh\ \rho_i = 0.5\ ln\ ((1+\rho_i)/(1-\rho_i))$ for i=0,1. The marginal significance level for the null hypothesis that ρ_0=0 in column 5 is slightly below 10%.

Figure 1
Proportion of sons employed currently or at some point in the past with an employer their fathers had worked for at any time in the past



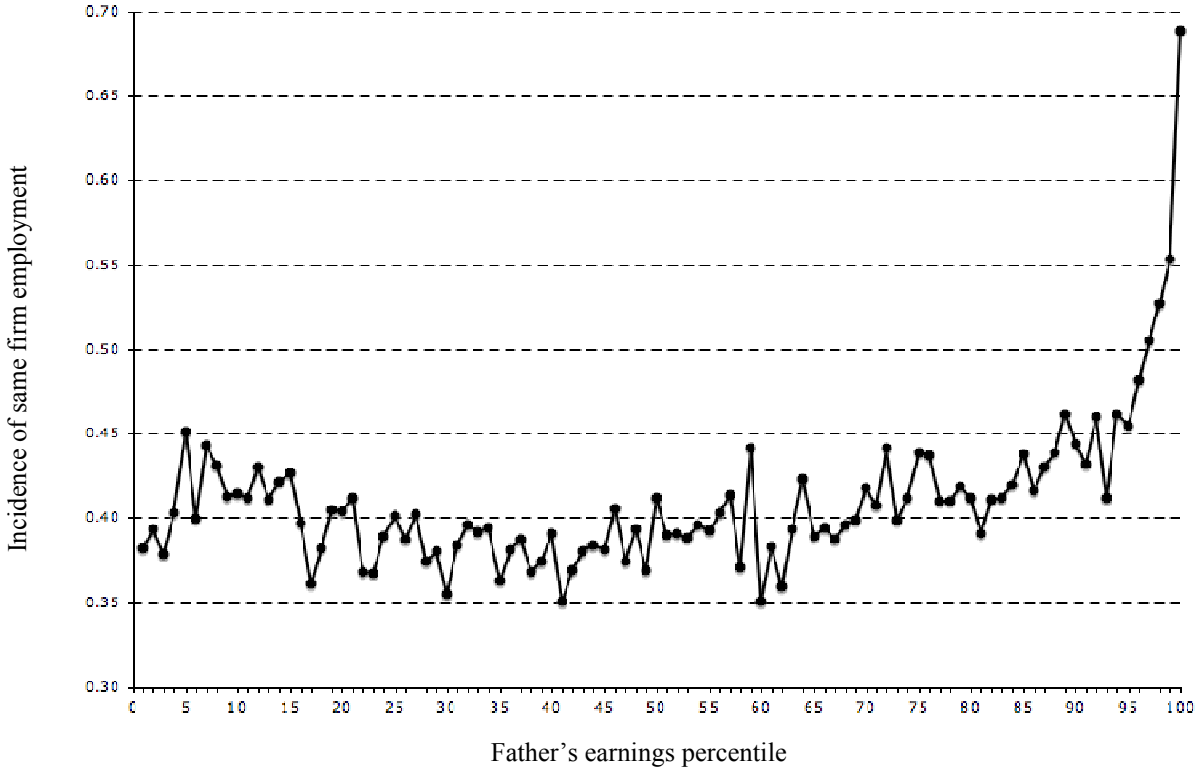
Note: Calculations are based on weighted observations of 71,215 sons who are all 33 years of age at the end of our observation period.

Figure 2
Proportion of sons employed currently with an employer their fathers had worked for at any time in the past, during the previous year, or during their teen years



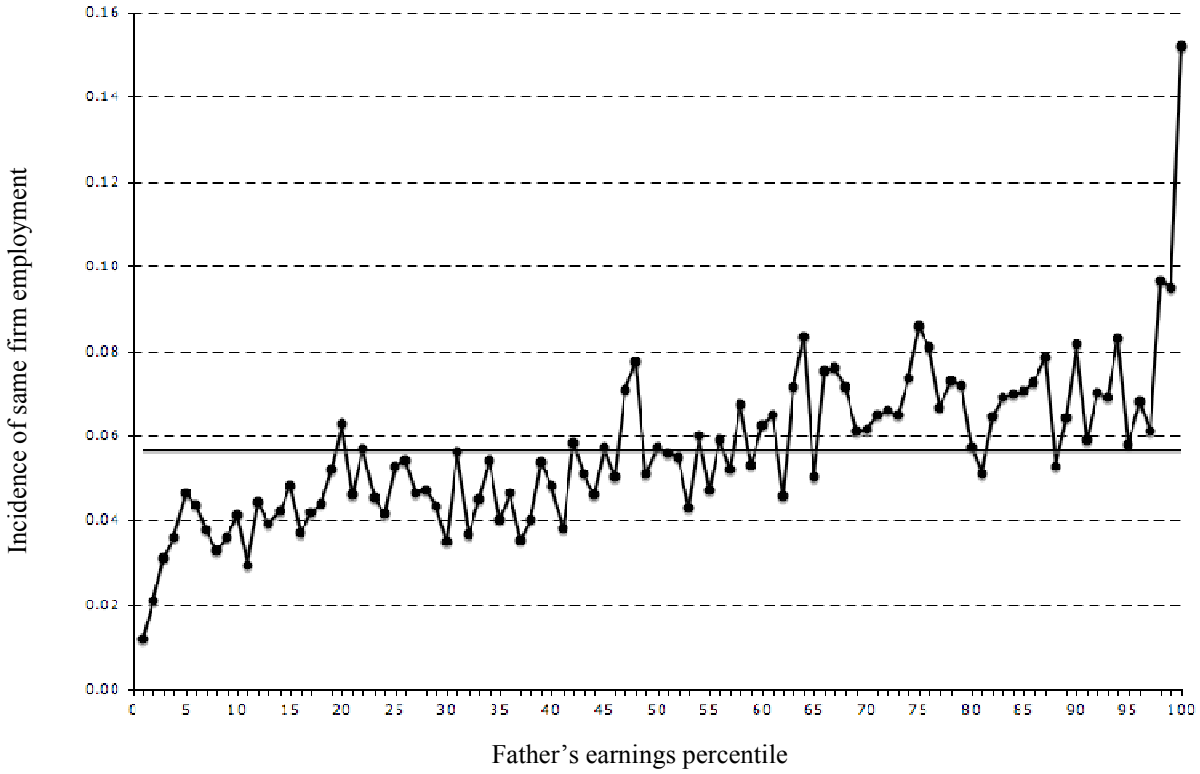
Note: Calculations are based on weighted observations of 71,215 sons who are all 33 years of age at the end of our observation period.

Figure 3
Proportion of sons employed currently or at some point in the past with an employer their fathers had worked for at any time in the past for each percentile of the father's earning distribution



Note: Calculations are based on weighted observations of 71,215 sons who are 33 years of age. Father's earnings percentiles are calculated using a five year average of earnings during the period sons were 15 to 19 years of age. On average fathers are 45.3 years old at the onset of this period.

Figure 4
Proportion of sons with the same main employer as their father for each percentile of the father's earning distribution: father's main employer when son was 15 to 19 years compared to sons main employer at age 33



Note: The horizontal line is drawn at 0.0566, the incidence of same firm employment for the entire sample. Calculations are based on weighted observations of 71,215 sons who are 33 years of age. Father's earnings percentiles are calculated using a five year average of earnings during the period sons were 15 to 19 years of age. On average fathers are 45.3 years old at the onset of this period.

Figure 5
Intergenerational earnings elasticities estimated using nearest neighbourhood estimation: Oldest cohort, ever same employer

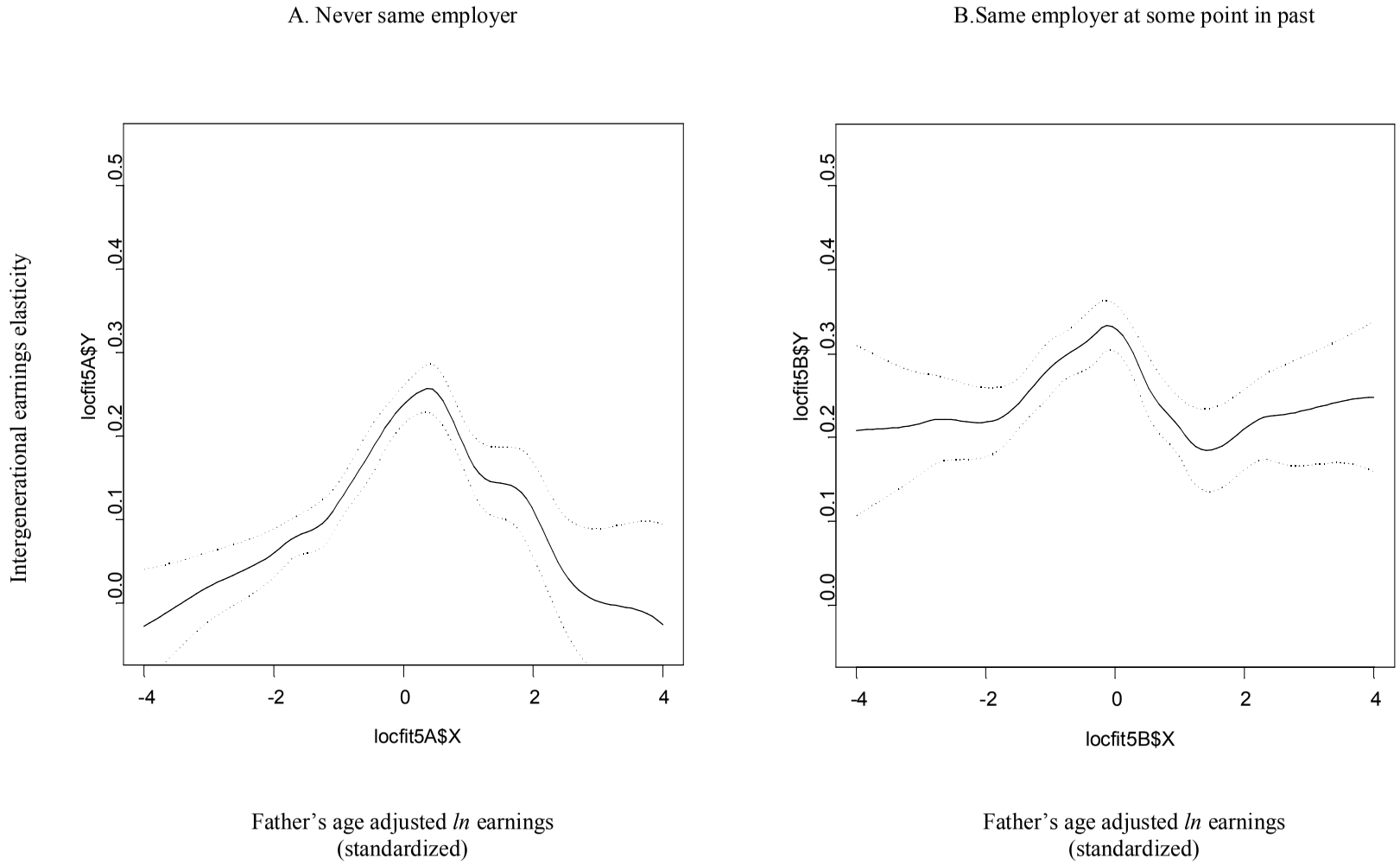
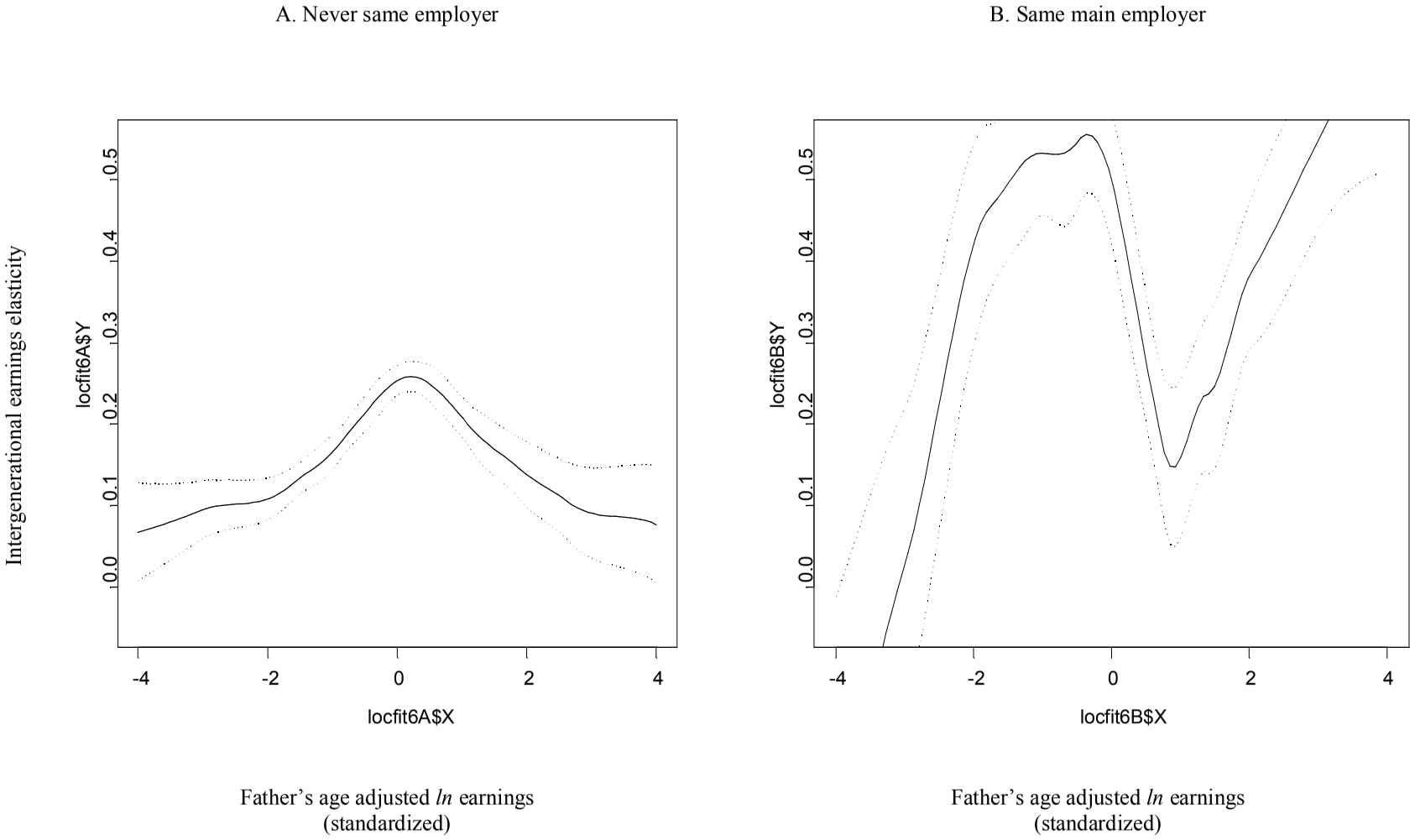


Figure 6
Intergenerational earnings elasticities estimated using nearest neighbourhood estimation: Oldest cohort, same main employer



Appendix Table A1
Sample sizes associated with the creation of the analytical files from the Intergenerational Income Data

	Sample size	Weighted sample size
Entire sample, all male cohorts	1,890,923	2,474,667
1963 to 1966 male cohorts	653,959	886,099
Fathers with positive earnings in each of five years when sons were 15 to 19 years of age	340,199	417,510
Sons with positive earnings in each of three years between 1994 and 1996	240,478	294,706
Bottom percentile fathers deleted	238,658	291,758
Bottom percentile sons deleted	236,490	288,964
Fathers born between 1908 and 1952	236,210	288,607
Only 1963 cohort, those 33 years of age in 1996	71,215	84,343
Analytical file for estimation containing only observations with non-missing information on all variables presented in Table 2	70,982	84,043