

07:2008 WORKING PAPER

Mohammad Azhar Hussain,
Martin D. Munk
Jens Bonke

HOW SENSITIVE IS INTERGENERATIONAL EARNINGS MOBILITY TO DIFFERENT MEASURES?

RESEARCH DEPARTMENT OF CHILDREN AND FAMILY

How Sensitive is Intergenerational Earnings Mobility to Different Measures?

Mohammad Azhar Hussain
Martin D. Munk
Jens Bonke

Working Paper 07:2008

The Working Paper Series of The Danish National Centre for Social Research contain interim results of research and preparatory studies. The Working Paper Series provide a basis for professional discussion as part of the research process. Readers should note that results and interpretations in the final report or article may differ from the present Working Paper. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including ©-notice, is given to the source.

HOW SENSITIVE IS INTERGENERATIONAL EARNINGS MOBILITY TO DIFFERENT MEASURES?

BY MOHAMMAD AZHAR HUSSAIN

The Danish National Centre for Social Research

AND

MARTIN D. MUNK

The Danish National Centre for Social Research

AND

JENS BONKE*

The Rockwool Foundation's Research Unit

The article provides various estimates of intergenerational earnings mobility based on Danish administrative register information. The aim is to calculate how sensitive the results are to different earning periods, age brackets, and earning components enabling the most accurate cross country comparison of intergenerational earnings mobility. Thus, intergenerational earnings mobility is found quite lower when applying hourly wage rates rather than annual earnings inclusive or exclusive of public transfers. Moreover, when applying the same specifications for Denmark as used for other countries, we find that intergenerational earnings mobility from father to son in Denmark is on the same level as in Sweden, Norway, and Finland, whereas the intergenerational earnings mobility in all the Nordic countries is found higher than in the UK and USA.

Keywords: Intergenerational mobility, sensitivity analyses, inequality, international comparison

JEL classification: J62; D63; C23

* Correspondence to: Jens Bonke, The Rockwool Foundation's Research Unit, DK-2100 Copenhagen, Denmark (jb@rff.dk)

1. INTRODUCTION

In order to improve the comparability of intergenerational earnings mobility, we apply the same earnings specifications for Denmark as used in other countries. Thus, for some countries the wage rates, indicating a measurement of individual productivity, have been applied, whereas in other countries the applied earnings measure is annual earnings inclusive or exclusive of sickness benefits and unemployment payment. Moreover, we use the same earnings periods for fathers and sons, and the same age-group specifications for sons. This is possible when applying information from Danish administrative registers, implying that the intergenerational earnings mobility comparisons in this article are on more equal terms than in other studies within this field of research, see e.g. Solon (2002).

The definition of intergenerational earnings mobility or social inheritance¹ applied in this article follows the usual understanding: the position of one generation in a rank order relative to the position of a second generation in its rank order. Thus, if a randomly sampled individual achieves a position in the earnings distribution independently of the position his or her parent achieved, the intergenerational earnings mobility is perfect or complete. In contrast, if the individual's position in the earnings distribution positively correlates with that of the parent in the earnings distribution, the intergenerational earnings mobility is incomplete.

A relatively high degree of intergenerational earnings mobility in a country might be caused by a condensed income distribution, an active labour market policy, free access to the educational system, and an equal opportunity-oriented educational policy. Therefore, high intergenerational earnings mobility is found within the Nordic countries, while low mobility is found in countries belonging to other welfare regimes.

¹ The concepts are used interchangeably in this article.

Section 2 reviews the literature of replicable studies. Section 3 discusses the definition of mobility, while the applied data are described in Section 4. Section 5 presents the findings for Denmark relatively to those of other countries, and the last Section concludes.

2. PREVIOUS STUDIES

The research on intergenerational mobility comes mainly in the form of various empirical analyses (e.g. Corak, 2004; Grawe, 2006; Bonke & Munk, 2003; Solon, 1999, 2002, 2004; Munk, 2003a; Bratberg et al., 2005, 2007). Two different approaches are applied: (a) the co-variation between the parents' and their children's' economic positions, and (b) siblings' economic position relative to that of non-siblings given the same background characteristics: A relatively small variation in siblings' economic position compared with that of non-siblings indicates low intergenerational earnings mobility, see Feinstein & Symons (1999). Solon (1999, 2002) and Corak (2006) offer an overview of the children and parent relationship, and Björklund *et al.* (2002) compare the two approaches of intergenerational earnings mobility.

The child-parent relationship approach ideally requires information on the permanent incomes of both generations. However, as most longitudinal datasets cover short time periods only approximations to permanent incomes are possible. In particular, finding incomes for the younger generation is difficult, since this generation is either pursuing education, or just in the beginning of its labour market career. Therefore, most studies on intergenerational earnings mobility apply only one or a few cohorts with small generational age-differentials, with the exception of Bratberg *et al.* (2005), and Bratberg *et al.* 2007 who analyses data for several cohorts and show that earnings mobility between fathers and sons increases over

time. Another problem is that most datasets include too few cases to analyze variations over the whole income distribution. Again, Bratberg *et al.* (2005) have managed to overcome this data problem and find the greatest mobility – the least social inheritance – in the middle of the distribution and more persistence at the top and bottom ends, while Bratsberg *et al.* (2007) find the greatest mobility in the bottom end, i.e. applying different earnings periods for the two generations and different earnings components.

Yet another issue in the intergenerational mobility literature is the problem of life cycle bias (cf. Haider & Solon, 2006; Grawe, 2006; Böhlsmark & Lindquist, 2006). For instance, Böhlsmark and Lindquist 2006 shows that the widespread use of current income as a proxy for lifetime income leads to inconsistent parameter estimates even when the proxy is used as the dependent variable. In addition, Mazumder (2005) has recently shown that an intergenerational elasticity based on short-term averages of fathers' earnings produces too low estimates - for the US around 0.4. However, the elasticities are downward biased by 30 % or more due to persistent transitory fluctuations, and the true estimates should be around 0.6 indicating lower intergenerational earnings mobility.

Although most studies focus on the earnings mobility between father and son, an increasing number of studies now estimates the earnings mobility between father and daughter and between mother and daughter/son, see e.g. Corak (2001), Chadwick & Solon (2002), Deding & Hussain (2005) and McIntosh & Munk (2007). Also the earnings mobility between son and daughter's individual as well as family earnings, and their parents and grand parent's earnings has recently been investigated (Raaum *et al.*, 2007).

An important question is how much of the mobility is attributable to genes and to socio-economic or environmental conditions. From Swedish adoption data, which include information on background characteristics for the biological parents, the adoptive parents and

the adoptees themselves, Björklund *et al.* (2006) demonstrate that both pre- and post-birth factors, such as childhood environment, contribute to intergenerational transmissions of income and education (see also Plug & Vijverberg, 2003, 2005, and Björklund *et al.*, 2007 for similar findings). Björklund *et al.* (2006) in fact show that pre-birth factors are found to be more important for the transmission of the mother's education and less important for the transmission of the father's income, as the latter is primarily affected by post-birth environment. Also Plug (2002, 2004), Behrman & Rosenzweig (2002)², and McIntosh & Munk (2007) have shown that parents' education has a greater impact than income on children's position in their distributions. In addition, to show the importance of both pre- and post-birth factors, a recent paper by Björklund *et al.* (2007) shows striking high estimates for the relationship between biological parents and their children in intergenerational transmissions of education, and they are substantial even for biological parents who are partly or completely absent from the post-birth environment.

However, the mechanisms leading to resource transmission from parents to children are still only vaguely identified (see Munk, 2003b; Björklund *et al.*, 2007; McIntosh & Munk, 2008). One explanation focuses on the transmission of economic capital from one generation to the next, while another focuses on the transfers of social and cultural capital. As proposed by Corak (2001) the transmission of social and cultural capital is probably best elucidated by comparing parents' earnings with their children's earnings, while the transmission of economic capital is best captured by comparing the incomes, i.e. wages, unearned income and private transfers, for the two generations. A clarification based on empirical evidence is

² Controlling for women's income and childrearing ability and the ability and schooling of their husband entail a marginally negative coefficient for mother's schooling and her child's schooling attainment, while the father's level of attainment remains significantly positive.

of importance for the development and implementation of policies within this field, e.g. “breaking the negative social inheritance”.

3. MEASUREMENT OF MOBILITY

In principle, two different measures are common within intergenerational mobility studies: the first estimates the destination of young people’s position in the earnings/income distribution, given their family background, while the second applies an aggregate measure derived from a statistical procedure.

The first measure ranks individuals in both generations – the 1st and the 2nd generation - into quantiles according to their income, which is illustrated by a mobility matrix. This matrix shows the correlations between the positions of the two generations at two points: one, when the 2nd generation is still living at home with their parents, and two when the 2nd generation has left home and established its own household.

The second measure of intergenerational mobility, which is applied in this paper, uses an aggregate measure from a regression equation:

$$(1) \quad \log E_i = \alpha + \beta \log y_{0i} + \varepsilon_i$$

where $\log E_i$ represents the logarithm of the permanent income for a child in family i , $\log y_{0i}$ represents the logarithm to the parent’s permanent income, ε_i is a random error term, and the slope β is the intergenerational elasticity-coefficient, i.e. changes in the child’s permanent income in relation to changes in the parent’s permanent income. The estimated elasticity measures the percentage change in the second generation’s income generated by a one percent change in the first generation’s income. If this coefficient is 0, intergenerational

mobility is complete, whereas a value above 0 indicates some intergenerational persistence, i.e. the origin of the parent in his/her earnings distribution predicts the destination of the child in his/her earnings distribution.

As earnings usually vary from year to year, average income for a longer period of time - the estimated permanent income - is a preferable measure (Haider & Solon, 2006). Also the age of the two generations is important, because it takes some time in life to obtain a more stable income. Choosing too young people increases the earnings variation, and thereby makes the measure of mobility more uncertain. Thus, applying both average incomes and correcting for the age of parents and children to avoid short-term variations in their incomes, is important.

Finally, as taxes and income transfers affect the distribution of income the applied earnings or income measure, i.e. gross earnings or net earnings, gross incomes or net incomes (Roemer *et al.*, 2003), is critical, and more so, the longer the time-span between the different generations. Moreover, unclear applied income concepts together with different tax and income transfer systems increase the uncertainty of international comparisons of intergenerational earnings mobility.

4. DATA

Different data sources are available for Danish intergenerational earnings mobility studies including information from longitudinal surveys (e.g. the Danish youth-cohort study) and from administrative registers at Statistics Denmark. Here, we apply the latter data, because they cover information on income components, family background, etc. for the whole

population for the period 1984-2002, and, therefore, offer greater opportunities for choosing the most appropriate cohorts and generations at different times.

The different earnings concepts in the analyses are annual earnings including or excluding sickness pay and unemployment insurance benefit, and hourly wage rates taken as a proxy for individual productivity.

We exclude incomes from self-employment, because these figures are not as reliable as earnings, due to a relatively large yearly variation influenced by specific tax-rules on this kind of income.

In the analyses, we included all sons aged 30-40 years in 2002 and their parents within the age interval of 30-66 years in 1984. Thus, the earnings we use for sons are from 2002, whereas we calculate the earnings for their fathers as averages for 1984-1988. The earnings are inflated with the consumer price index with 2002 as the baseline year.

Table 1 gives an overview of the statistical information in the applied Danish data.

Table 1 here

5. METHODOLOGY

The calculation of intergenerational earnings mobility applies the elasticity coefficient method in (1), because this method allows comparisons between different countries, most of which are included in Solon (2002). However, some studies applying the same method are excluded from the comparison because they looked at very young sons as the second

generation (Couch & Dunn, 1997)³ or applied only one-year earnings for parents (Blanden *et al.*, 2005). The variation in age-brackets of the generations and the earning periods of the second generation between the remaining studies is controlled for by using the same delimitations in the Danish calculations as in the different comparative studies, which is possible due to the richness of the Danish dataset.

Besides the international comparison of intergenerational earnings mobility, the different calculations for Denmark also allow for studying, how sensitive the earnings elasticity is to the delimitation of age-groups and earnings periods.

6. FINDINGS

The different earnings concepts applied in this analysis allow for studying, how sensitive the results are to earnings definitions. This sensitivity is firstly illustrated by a significant difference between the father-son earnings elasticity based on wage rates which amounts to 0.224, and the corresponding estimated elasticity based on annual earnings exclusive of unemployment and sickness benefits which amount to 0.123 (cf. Table 2). The latter concept is applied in most other studies of intergenerational mobility. The elasticity increases to 0.136 when including sickness payment and unemployment benefits in annual earnings, as in the Norwegian case. This means that intergenerational earnings mobility is actually lower when different kinds of benefits are included, which indicates that social heritage is stronger in the lower end of the earnings distribution. This follows Bratberg *et al.* (2005), who find the

³ The estimated elasticities are smaller and the standard errors higher, i.e. 0.11 (0.06) for Germany and 0.13 (0.06) for the US, than in other studies for these two countries. The explanation might be that because of the sons' very young age, 23 and 25 years old, respectively, they have not yet a permanent position on the labour market, and, thereby, a permanent income.

greatest social inheritance in the bottom and the top end of the distribution, but is in contrast to Bratsberg *et al.* (2007), who find higher intergenerational mobility at the bottom end than in the middle and the top of the distribution. The relatively high elasticity coefficient found when applying wage rates shows that individual productivity is inherited from the parents to a larger degree than annual earnings (wage rates * hours of work) and receiving public income transfers.

Table 2 about here

Table 3 about here

Secondly, if intergenerational earnings mobility for Denmark is calculated using the same measures – income concepts, age-brackets and earning periods – as used for various other countries (β^{DK} in column 1) we find nearly the same level of intergenerational earnings mobility in Denmark as in Finland and Norway, but higher than for one of the calculations for Sweden (Björklund & Jäntti, 1997, and Jäntti *et al.*, 2006), see column 3 of Table 3. This demonstrates that there is only a small variation in intergenerational earnings mobility variation between the Nordic countries. However, relatively to Canada the intergenerational earnings mobility in the Nordic countries is found higher, and this is even more pronounced comparing with Germany, UK and the United States, where very low intergenerational

earnings mobility is found. The earnings elasticity in the US studies is between 0.24 and 0.49 higher than for Denmark when applying the same age and earnings periods.

The observed smaller social heritage in the Nordic countries is usually explained by the compressed earnings distributions found in these countries (Danish Economic Council, 2001; Bonke & Munk, 2002; Danish Economic Council, 2006).

How sensitive the calculations are according to the use of different age-groups and earnings periods is depicted in column 1 of Table 3 where we compare international findings. As an example, we find that calculations referring to very young second generation individuals as is the case for some Canadian, German and American studies (Corak & Heisz, 1999; Blanden, 2005; Solon, 1992; Zimmerman, 1992), give elasticities considerably smaller than within other studies for Canada and US., which include older second generation individuals (Corak, 2001; Björklund & Jäntti, 1997; Couch & Lillard, 1998). Another example is the effect of applying different earning periods, e.g. Blanden, 2005, Österbacka, 2001. This shows that earnings elasticities are very sensitive to the age-groups and the earning periods applied which has to be taken into consideration when comparing different mobility studies.

7. CONCLUSIONS

In this study we estimated intergenerational earnings mobility for Denmark applying different specifications with the aim of presenting the most appropriate comparison with studies for other countries.

As the earnings elasticity was expected to be sensitive to the applied measure, different measures were introduced, including hourly wage rates, annual earnings inclusive or

exclusive of unemployment and sickness benefits. We show that the wage rate taken as a productivity proxy implies less intergenerational earnings mobility than the yearly earnings measures, which also depends on the number of hours spent on the labour market. Moreover, we find that the Danish intergenerational earnings elasticity is relatively small indicating high mobility between Danish generations. This is the case when exercising yearly earnings as well as hourly earnings based on information from administrative registers for the period 1984-2002.

As the different international estimations apply different delimitation criteria concerning sons' age and different earnings periods, corrections were made to take this into consideration, which is not the case in most other comparative studies. We found that the Danish intergenerational earnings mobility is at nearly the same level as in Sweden, Norway, and Finland, while comparable mobility estimates for Canada are smaller than for Denmark. For all these countries, however, the level was considerably lower than for Germany and especially for UK and the United States.

These findings indicate that the Nordic welfare model, and probably also the Canadian, ensures relatively more equitable opportunities compared to other welfare models, no matter whether one comes from privileged or less privileged backgrounds. This confirms the findings by Mayer & Lopoo (2008) showing greater intergenerational mobility in states spending more on children than in states spending less on children, e.g. within the US. This conclusion, however, only makes sense if mobility studies are based on the same earnings concepts, age-group and earning periods.

REFERENCES

- Behrman, J. R. and Rosenqweig, M. R., "Does Increasing Women's Schooling Raise the Schooling of the Next Generation?". *American Economic Review* 92 (1), 323-334, 2002.
- Björklund, A. and Jäntti, M., "Intergenerational Income Mobility in Sweden Compared to the United States". *American Economic Review*, 87, (5), 1009-18, 1997.
- Björklund, A., Eriksson, T., Jäntti, M., Raaum, O., and Österbacka, E., "Brother Correlations in Earnings in Denmark, Finland, Norway, and Sweden compared to the United States", *Journal of Population Economics* 15, 757-772, 2002.
- Björklund, A., Lindahl, M., and Plug, E., "The Origins of Intergenerational Associations: Lessons from Swedish Adoption Data", *Quarterly Journal of Economics* 121, 999-1028, 2006.
- Björklund, A, Jäntti, M., and Solon, G., "Nature and Nurture in the Intergenerational Transmission of Socioeconomic Status: Evidence from Swedish Children and Their Biological and Rearing Parents, *The B.E. Journal of Economic Analysis & Policy* 7(2) (advances), article 4, 2007
- Blanden, J., "International Evidence on Intergenerational Mobility". Centre for Economic Performance, London School of Economics and Department of Economics, University College London, 2005.
- Blanden, J., Gregg, P. and Machin, S., "Intergenerational Mobility in Europe and North America". A Report Supported by the Sutton Trust. April 2005. London, 2005.
- Bonke, J. and Munk, M. D., "Fordelingen af velfærd i Danmark", report 02:27, The Danish National Institute of Social Research, 2002.
- Bonke, J. and Munk, M. D., "Hvad skyldes social mobilitet i Danmark?" *Nordisk Sosialt Arbeid* 23 (4), 224-231, 2003.

- Bratberg, E., Nilsen, Ø. A. and Vaage, K., “Intergenerational Earnings Mobility in Norway: Levels and Trends”. *Scandinavian Journal of Economics* 107(3), 419-435, 2005.
- Bratberg, E., Nilsen, Ø. A. and Vaage, K.,”Trends in Intergenerational Mobility across Offspring’s Earnings Distribution in Norway”. *Industrial Relations* 46(1), 112-129, 2007
- Bratsberg, B., Røed, K., Raaum, O., Naylor, R., Jäntti, M., Eriksson, T. and Österbacka, E.,”Nonlinearities in Intergenerational Earnings Mobility: Consequences for Cross-Country Comparison. *The Economic Journal* 117, (March), C72-C92, 2007.
- Böhlsmark, A. and Lindquist, M.J., “Life-cycle Variations in the Association between Current and Lifetime”, *Journal of Labor Economics* 24(4), 879-896, 2006
- Chadwick, L. and Solon, G. “Intergenerational Income Mobility among Daughters”. *American Economic Review* 92 (1), 2002.
- Corak, M., “Are the Kids All Right? Intergenerational Mobility and Child Well-Being in Canada”, *The Review of Economic Performance and Social Progress 2001: The Longest Decade: Canada in the 1990s*, volume 1, 2001.
- Corak, M., “*Dynamics of Generational Income Mobility in North America and Europe*”. Cambridge University Press, Cambridge, 2004..
- Corak, M., “Do Poor Children Become Poor Adults? Lessons from a Cross Country Comparison of Generational Earnings Mobility”, IZA DP no. 1993, 2006.
- Corak, M. and Heisz, A., “The Intergenerational Income and Income Mobility of Canadian Men: Evidence from Longitudinal Income Tax Data”, *Journal of Human Resources* 34 (3), 504-33, 1999.
- Couch, K. A. and Dunn, T. A., “Intergenerational Correlations in Labor Market Status: A Comparison of the United States and Germany”, *Journal of Human Resources*, 32 (1), 210-32, 1997.

- Couch, K. A. and Lillard, D. A., "Sample selection and the intergenerational correlation in earnings". *Labour Economics* 5, 313-329, 1998.
- Danish Economic Council, DØR, "*Vismandsrapporten Efterår 2001*". Det Økonomiske Råds Sekretariat, 2001.
- Danish Economic Council, DØR, "*Vismandsrapporten Efterår 2006*". Det Økonomiske Råds Sekretariat, 2006.
- Deding, M. C. and Hussain, M. A., "Educational Attainment in Denmark - Effects of parents' education and living conditions". *Journal of Applied Social Science Studies* 125 (3), 347-368, 2005.
- Ermisch, J., Francesconi, M. and Siedler, T. "Intergenerational Economic Mobility and Assortative Mating". IZA Discussion Papers 1847, Institute for the Study of Labor (IZA), Bonn, 2005.
- Feinstein, L. and Symons, J., "Attainment in secondary school". *Oxford Economic Papers* 51 (2), 300-321, 1999.
- Haider, S. and Solon, G., "Life-Cycle Variation in the Association between Current and Lifetime earnings", *American Economic Review* 96 (4), 1308-1320, 2006.
- Grawe, N., "Life cycle bias in estimates of intergenerational earnings persistence". *Labour Economics* 13 (5), 551-570, 2006.
- Jäntti, M., Røed, K., Naylor, R., Björklund, A., Bratsberg, B., Raaum, O., Österbacka, E., Eriksson, T., "American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in Nordic Countries, the United Kingdom and the United States". IZA DP no. 1938. 2006.

- Mazumder, B., “Fortunate sons: New estimates of intergenerational mobility in the U.S. using social security earnings data”. *Review of Economics and Statistics* 87(2), 235-255. 2005
- Mayer, S.E. and Lopoo, L.M., “Government spending and intergenerational mobility”. *Journal of Public Economics* 92, 139-158, 2008.
- McIntosh, J. and Munk, M. D., “Scholastic Ability vs. Family Background in Educational Success in Denmark”, *Journal of Population Economics* 20 (1), 2007.
- McIntosh, J. and Munk, M. D., “Social Class, Family Background, and Intergenerational Mobility”, *European Economic Review* forthcoming 2008
- Munk, M. D., “*Social mobilitet. Social mobilitet i Danmark – set i et internationalt perspektiv*”, *Arbejdsrapport 9: 2003*, the Danish National Institute of Social Research, 2003a.
- Munk, M. D., ”Uddannelsesmobilitet – betydningen af kognitive strukturer og kulturel kapital”, *Uddannelse* 36 (8), 14-20, 2003b.
- Österbacka, E., “Family Background and Economic Status in Finland”. *Scandinavian Journal of Economics* 103 (3), 467-84, 2001.
- Österberg, T., “Intergenerational Income Mobility in Sweden: What Do Tax-Data Show?” *Review of Income and Wealth* 46 (4), 421-36, 2000.
- Plug, E., “*How Do Parents Raise the Educational Attainment of Future Generations?*” Discussion Paper n. 652, The Institute for The Study of Labor (IZA), Bonn, 2002.
- Plug, E., “Estimating the Effect of Mother’s Schooling on Children’s Schooling Using a Sample of Adoptees”. *American Economic Review* 94(1), 358-368, 2004.
- Plug, E. and Vijverberg, W., ”Schooling, Family Background and Adoption: Is it Nature or is it Nature?” *Journal of Political Economy* 111, 611-641, 2003.

- Plug, Erik and Vijverberg, W., “Does Family Income Matter for Schooling Outcomes? Using Adoptees as a Natural Experiment”. *Economic Journal* 115, 879-906, 2005.
- Raaum, O., Bratberg, B., Røed, K., Österbacka, E., Eriksson, T., Jäntti, M. and Naylor, R., ”Marital Sorting, Household Labor Supply, and Intergenerational Earnings Mobility across Countries”. IZA DP No. 3037. September 2007.
- Roemer, J. E., Aaberge, R., Colombino, U., Fritzell, J., Jenkins, S. P., Lefranc, A., Marx, I., Page, M., Pommer, E., Ruiz-Castillo, J., San Segundo, M. J., Tranæs, T., Trannoy, A., Wagner, G. G. and Zubiri, I., “To What Extent Are We Equalizing Opportunities for Income Acquisition Among Citizens”. *Journal of Public Economics* 87 (3/4), 539-565, 2003.
- Solon, G., “Intergenerational income mobility in the United States”. *American Economic Review* 82, 393-408, 1992.
- Solon, G., “Intergenerational Mobility in the Labour Market”. *Handbook of Labor Economics*, Volume 3. Ed. by O. Ashenfelter and D. Card. New York: North Holland, 1999..
- Solon, G., “Cross-Country Differences in Intergenerational Income Mobility”. *Journal of Economic Perspectives* 16 (3), 59-66, 2002.
- Solon, G., “A Model of Intergenerational Mobility Variation over Time and Place”. In: Corak, M., *Generational Income Mobility in North America and Europe*, Cambridge: Cambridge University Press, 2004.
- Zimmerman, D., “Regression Toward Mediocrity in Economic Stature”. *American Economic Review* 82, 409-429, 1992.

TABLES

TABLE 1
DESCRIPTIVE STATISTICS FOR DENMARK
(ANNUAL WAGES)

| | Means | Standard Deviation |
|-------------------------------|---------|-----------------------|
| <i>Son</i> | | |
| Age in 2002 | 34.84 | 3.13 |
| Annual earnings 2002 | 317,793 | 172,656 |
| Log annual earnings 2002 | 12.48 | 0.83 |
| <i>Father</i> | | |
| Age in 1984 | 45.34 | 6.28 |
| Annual earnings 1984-1988 | 381,067 | 187,365 |
| Log annual earnings 1984-1988 | 12.73 | 0.59 |
| Number of observations | 165,774 | |

TABLE 2
 INTERGENERATIONAL FATHER-SON EARNINGS ELASTICITY IN
 DENMARK APPLYING DIFFERENT EARNINGS CONCEPTS
 (STANDARD ERRORS IN PARENTHESIS)

| | Hourly wage | Annual wage | Annual wage, UI, and sickness benefit |
|-----|-------------|-------------|--|
| | Father | Father | Father |
| Son | 0.224 | 0.123 | 0.136 |
| | (0.004) | (0.004) | (0.004) |

Note: Sons are aged 30-40 years in 2002 and their log earnings are from 2002. Fathers' log 5-years' average earnings are from 1984-88.

TABLE 3
INTERGENERATIONAL FATHER-SON EARNINGS ELASTICITY IN DENMARK RELATIVELY
TO OTHER COUNTRIES CONTROLLING FOR DIFFERENT AGE-BRACKETS AND EARNING-
PERIODS

| | Elasticity for DK applying the same characteristics as in the comparative source β^{DK} | Elasticity applying national data β | Elasticity differentials between DK and the country under comparison $\beta^{DK} - \beta$ | Son | Father | Source |
|---------|--|---|--|---|---|----------------------------------|
| Norway | 0.09 | 0.13 | -0.04 | Log 5-yrs. annual earnings in 1991-95, ages 31-35 yrs. | Log 5-yrs. mean annual earnings | Bratberg <i>et al.</i> (2005) |
| Norway | 0.08 | 0.16 | -0.08 | Log 2-yrs. annual earnings in 1992 and 1999, ages 34 and 41 yrs. | Log 2-yrs. mean annual earnings | Bratberg <i>et al.</i> (2007) |
| Sweden | 0.07 | 0.13 | -0.06 | Log 3-yrs. annual earnings; ages 25-51 yrs. | Log 3-yrs. annual earnings | Österberg (2000) |
| Sweden | 0.12 | 0.28 | -0.16 | Log annual earnings in 1990; ages 29-38 yrs. | Log annual earnings: Estimated from education and occupation | Björklund & Jäntti (1997) |
| Finland | 0.06 | 0.13 | -0.07 | Log 3-yrs. mean annual earnings; ages 30-40 yrs. | Log 2-yrs. mean annual earnings | Österbacka (2001) |
| Canada | 0.09 | 0.23 | -0.14 | Log annual earnings in 1995; ages 29-32 yrs. | Log 5-yrs. mean earnings | Corak & Heisz (1999) |
| Canada | 0.13 | 0.26 | -0.13 | Log annual earnings in 1998; ages 32-35 yrs. | Log 5-yrs. mean annual earnings | Corak (2001) |
| Canada | 0.09 | 0.19 | -0.10 | Log annual earnings in 1998; age 30 yrs. | Log 5-yrs. mean annual earnings | Blanden (2005) |
| Germany | 0.09 | 0.30 | -0.21 | Log monthly earning in 2000; age 30 yrs. | Log 5-yrs. average monthly earnings | Blanden (2005) |
| UK | 0.05 | 0.45 | -0.40 | Log 2-yrs. annual earnings in 1991 and 1991, ages 33 and 41 yrs. | Log annual earnings | Bratberg <i>et al.</i> (2007) |
| USA | 0.09 | 0.33 | -0.24 | Log annual earnings in 2000; age 30 yrs. | Log 5-years average monthly earnings | Blanden (2005) |
| USA | 0.11 | 0.39 | -0.28 | Log annual earnings in 1987; ages 28-36 yrs. | Log 5-years mean annual earnings | Björklund & Jäntti (1997) |
| USA | 0.05 | 0.41 | -0.36 | Log annual earnings in 1984; age 25-33 yrs. | Log 5-years mean annual earnings | Solon (1992) |
| USA | 0.11 | 0.37 | -0.26 | Log annual earnings in 1980; ages 28-38 yrs. | Log 4-years mean annual earnings | Couch & Lillard (1998) |
| USA | 0.05 | 0.54 | -0.49 | Log annual earnings in 1981; ages 25-33 yrs. | Log 5-years mean earnings | Zimmerman (1992) |

β^{DK} : Own calculations based on Danish data, but with son's age and son/father incomes defined as in the studies mentioned in the 'Source' column.

Note: Some newer estimates in Bratsberg et al. (2007) for Finland and the USA were not included because they were based on too old sons (Finland) and applied family income (USA).