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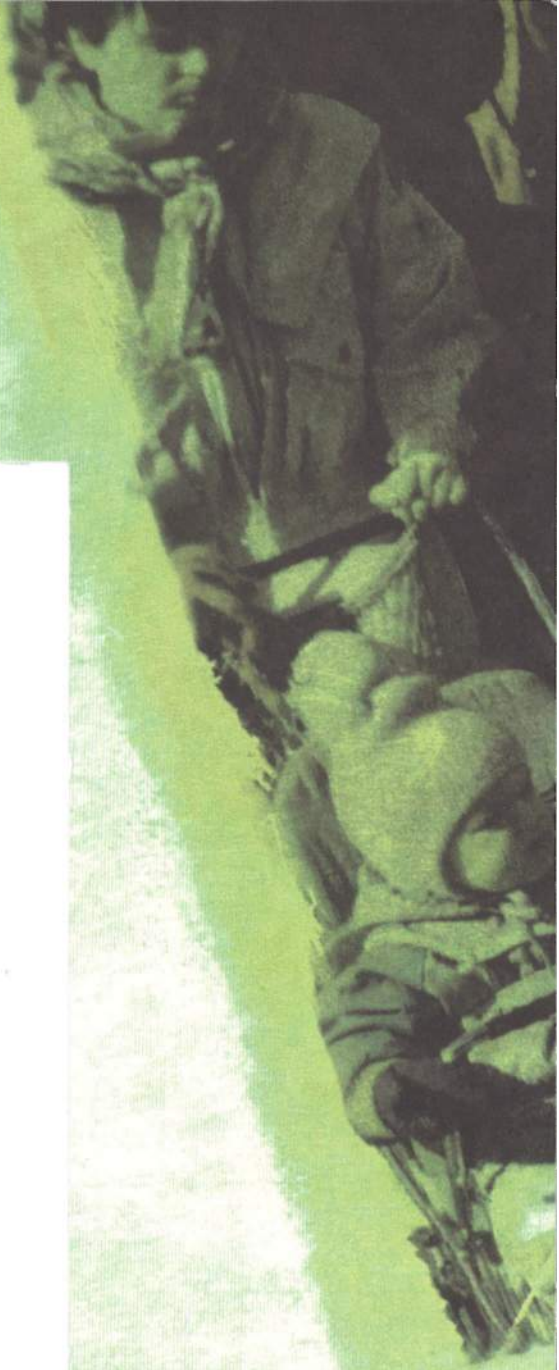

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Income mobility, persistent inequality and age, recent experiences from Finland

Ilpo Suoniemi
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PALKANSAAJIEN TUTKIMUSLAITOS LABOUR INSTITUTE FOR ECONOMIC RESEARCH

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ABSTRACT

We use a very large register based Finnish income panel data with detailed information on the composition of income over a ten year time period, 1995–2004 to examine Finnish income mobility. We use measures of income mobility which are based on the degree of income reduction over time (Shorrocks 1978). There is significant income mobility in the Finnish income distribution and mobility is decreasing with age and with a further drop near retirement age. We find a decrease in income mobility if the late 1990's are compared with early 2000's. The drop in mobility is largest among the youngest age groups and the probability of staying in the lowest income decile has also increased. Permanent income inequality has increased in five year cumulated incomes. The results suggest that distribution of lifetime income has widened. Since there has a general downward trend in mobility affecting the working age groups the income mobility in the groups 50–54 and 55–59 years old are currently at the same level as in the age group 60–64 old. Decompositions of cumulated incomes by income components reveal that the increase in annual values of income inequality has been transformed almost one-to-one into an increase in permanent inequality. Capital income although it represents in our data less than 5 percent of the total equivalised disposable income has increased its contribution to overall inequality equally to that of labour income which represents for about 95 percent of disposable income. Similar analysis of gross income reveals that the recent decline in the progressivity of taxation seems to be permanent and not due to temporal year to year variation.

Keywords: income mobility, persistent inequality, taxes and transfers.

JEL classification: D31, H24

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ABSTRAKTI

Tutkimuksessa tarkastellaan laajan rekisteriaineiston avulla Suomen tuloliikkuvuutta vuosina 1995–2004. Aineisto sisältää tietoja tulojen rakenteesta, omaisuus- ja palkkatuloista ja muista tulonlähteistä, erityisesti julkista tulonsiirroista ja maksetuista veroista. Tuloliikkuvuuden mittaaminen perustuu siihen, missä määrin väestön tuloerot pienenevät, kun mittaus perustuu pidemmän aikavälin keskituloihin eikä yksittäisen vuoden antamiin tuloksiin (Shorrocks 1978). Suomessa tulojakauman sisäinen tuloliikkuvuus on merkittävää. Tuloliikkuvuus vähenee iän myötä ja erityisesti eläkkeelle siirtymisen yhteydessä. Tuloliikkuvuus pienentyi 2000-luvulle siirryttäessä aiemmasta ja pysyvyys alimmassa tulokymmenyksessä lisääntyi. Suomen tuloerot ovat kasvaneet myös pidempiaikaisia viiden vuoden keskituloja tarkasteltaessa. Muutos oli merkittävä työikäisten ja erityisesti nuorten alle 30-vuotiaiden ryhmässä. Tuloliikkuvuus aleni viisivuotisikäryhmissä 50–54- ja 55–59-vuotiaat samalle tasolle kuin ikäryhmässä 60–64-vuotiaat. Tulokset viittaavat siihen, että elinkaarituloissa mitatut tuloerot ovat kasvaneet. Käytettävissä olevien tulojen dekomponointi paljastaa, että vuosittaisten tuloerojen muutokset näkyvät myös pidemmän ajan tuloeroissa. Pääomatulojen vaikutus pysyvien tuloerojen kasvuun oli samaa luokkaa kuin työtulojen vaikutus, vaikka niiden tulo-osuus oli huomattavasti pienempi. Bruttotulojen Gini-kertoimen dekomponointi paljastaa, että viimeaikainen välittömän verotuksen progressiivisuuden aleneminen vaikutti myös pysyviin tuloeroihin eikä ollut pelkästään vuosittaisten vaihtelujen seuraus.

Asiasanat: tuloliikkuvuus, pysyvät tuloerot, verotus ja tulonsiirrot.

Kiitämme Mikko Kauttoa, Jukka Pirttilää, Thor Thoreseniä ja Hannu Uusitaloa asiantuntevista ja arvokkaista kommenteista. Kiitämme Tilastokeskuksen Pihla Merimaata ja Pekka Ruotsalaista tutkimusaineiston ongelmakohtien selvitystyöstä. Tutkimuksen taitosta kiitokset Anja Kalliolle Eläketurvakeskuksesta.

CONTENTS

1 Introduction

Since early 1980s there has been widening income inequality in the United States and in the United Kingdom. In some other countries, such as Germany and Japan, the increase up to the early 1990s has been more modest, and Canada, France and Italy show no overall rise over the same period (Atkinson 2000). In addition, there has been surge in top incomes in some countries over the last 10–20 years. At the other end of the income distribution it has been documented that relative poverty rates have increased during the same time period as the top incomes have soared. In other words, the income distribution has been polarized.

Among the hypotheses about the causes of these changes are the shift from manufacturing to service production, technological change, expanding international trade and finance. Of these, the most frequently cited explanation is that skill biased technological change, particularly in the advent of computerised technologies, has shifted labour demand in favour of relatively high skilled and more educated workers and has driven up the wages (employment) of the higher skilled and driven down those of the lower skilled (see Atkinson 2000, for exposition and criticism of this explanation).

Piketty and Saez (2003) join with Atkinson in challenging the skill-biased technological change thesis on the grounds that the timing of the shifts in income differences does not support it in the US. Similarly they contend that widening income differences cannot be a simple response to technical change or to changes in the supply of educated workers, because the increase is highly concentrated among the very highest earners (Atkinson 2002, 2003; Atkinson and Piketty 2007). The theory is not able to explain the rise of working rich. Piketty and Saez (2003) instead argue that changing social norms and power are important factors in explaining the recent increase in income inequality and top income shares. These development have affected most Anglo-Saxon countries, including USA, UK and Canada (Atkinson 2002; Piketty and Saez 2003) while in Europe Netherlands, France and Switzerland display hardly any change in top income shares (Atkinson and Piketty 2007).

In Finland annual income inequality rose significantly during the latter part of the 1990s (Riihelä et al. 2001). The period of major income equalization from the early 1970s to the mid 1990s has been reversed, taking the values of the Gini coefficient to levels of inequality found 30 years ago. Widening differentials in earnings seem to play a minor role in these developments even though the Finnish economy has experienced mass unemployment and dramatic restructuring of the economy in the 1990's. As a general pattern, inequality rose with growing capital income shares. In particular, among the well-to-do the share of capital income grew most significantly during the late 1990s (Riihelä et al. 2001, 2005; Jäntti et al. 2009).

Observing the rise of mega-incomes for the very top earners in the US, Piketty and Saez (2003) conclude that "the coupon-clipping rentiers have been overtaken by the working rich".

In Finland the opposite seems true. The decline in income progressivity since the mid 1990s and the unprecedented increase in the share of capital income are important factors explaining both the increase in income inequality and top income shares in Finland (Riihelä et al. 2008). Piketty and Saez (2003) give a central role to taxation, executive compensation and shocks to capital returns. In Finland, the 1993 tax reform, introducing the Nordic dual income tax model, is one of the key factors responsible for this trend. Differential taxation of labour and capital income created strong incentives to shift labour income to capital income for those in the highest marginal tax brackets (Lindhe et al. 2004; Pirttilä and Selin 2006). The increase in relatives poverty rates has been associated with cuts in social transfers since the mid 1990s (Riihelä et al. 2004; Suoniemi 2006). The Finnish experience shows how changes in public policy instruments, taxation of capital, may have important effects on the income distributions which differ from those in other countries

It has long been recognized that income distributions with income cumulated over a longer time horizon give a better picture of inequality and economic welfare than distributions based on snapshot income. In a given year, people may have incomes which are transitorily high or low for reasons such as unemployment, illness, retirement, youth, good or bad luck, or exceptional economic events. Cross-sectional income distributions may give an incomplete and sometimes even distorted picture of longer-term economic well-being. Measuring economic mobility gives information about short term changes of people moving in the income distribution.

One of the primary motivations for economic mobility studies is to measure the extent to which longer-term incomes are distributed more or less equally than incomes in a single year. Shorrocks (1978) has emphasised: ”Mobility is regarded as the degree to which equalization occurs as the period is extended. This view captures the prime importance of mobility for economists.” If we observe high income mobility, the degree of inequality in any given year would be unimportant, because the distribution of lifetime income would be very even. In contrast, a society with a rigid income distribution where everybody stays in the same position year after year is commonly regarded as inferior to a more mobile society, see Friedman (1962). An increase in income mobility tends to reduce inequality in lifetime income relative to that in a single period and is an indication that the economy is performing better. Similarly, the recent rise in income inequality would be of no importance if it had been accompanied with a rise in mobility.

More generally, income mobility may be viewed as a coin with two sides. The beneficial effects of mobility on long term inequality are in considered in this paper. The opposite side concerns with the variability of individual incomes. Risk-averse economic agents view rise in income mobility as an increase in income risk which decreases economic well-being in comparison with a steady flow of income. In our opinion these considerations are of equal importance.[1]

1 There is no consensus on how income mobility should be measured. A great variety of aspects and different methods involved in mobility studies are considered in Fields and Ok (1999). We will consider some of these effects and the corresponding risk-adjusted measures of individual economic well-being in a follow-up paper.

The paper is organized as follows. Section 2 introduces the mobility index (Shorrocks 1978) and the underlying inequality measures that we apply, the Gini coefficient, (half) the coefficient of variation squared and the Theil entropy coefficient of inequality. The last two are members in the generalized entropy family of inequality measures. Our data is discussed in section 3. The empirical results are presented in section 4. Section 5 concludes.

2 Methods

Shorrocks (1978) considers income mobility as a source of equalisation of longer term income inequality as the observation period is lengthened. For Shorrocks, mobility is the opposite of rigidity (stability), defined as follows. For the case of *T* annual observations on income, the rigidity index compares the inequality of the mean income with the inequality of single-period incomes. Let y_{it} denote the income of individual *i* at time *t* and $\mathbf{y}_t$, $t = 1,\ldots, T$, be the vector of annual incomes in the population. Similarly, let $y_i = (1/T) \sum_t y_{it}$, be the mean income received by individual *i* over *T* periods, and $\mathbf{y}$ the corresponding vector. Let *I(.)* be an inequality measure which is a convex function of relative incomes, i.e. scale invariant. Shorrocks's rigidity index has in the numerator the inequality of *T*-period cumulated mean income, and in the denominator a weighted average of the inequality in each year, with the weights being the ratio of the mean income in that year to the mean income over *T* years, $w_t = \mu_t / \mu$:

$$R_T = \frac{I(y)}{\sum_t w_t I(y_t)}. \qquad (1)$$

Shorrocks's mobility index is then $M_T \equiv 1 - R_T$. Both R_T and M_T are bounded in the zero-one interval, since by convexity $I(y) \leq \sum w_t I(y_t)$. Mobility index which is dependent on the length of the time horizon, *T*, gives the degree of income equalization as measured by mean income relative to annual income. Accordingly, R_5 equals 0.80 (M_5 = 0.20) indicates that 80 percent of the average annual level of inequality persists over a five year observation period, or alternatively income inequality decreases by 20 percent when cumulated over five years.

The mobility index is dependent on which underlying measure of income inequality is used. Different measures of income inequality weight the underlying income distributions differently. Corresponding mobility indices summarize the contributions of individual income movements differently according to their position in the distribution. We apply three measures of inequality in the paper.

The Gini coefficient is the most extensively used summary measure of inequality. Commonly, the Gini coefficient is defined as twice the area bounded by the Lorenz curve and the unit diagonal. But it can be written in the following alternative form showing that the Gini coefficient is less sensitive than other indices to observations in the tails of the distribution:

$$\mathbf{G(y) = 1 - (2/\mu)\, E\, y\, (1\text{-}F) = (1/2\mu)\, E\, |\, y_1 - y_2\, |}, \qquad (2)$$

where *E* refers to the expectation (mean) operator, *F* is the cumulative distribution function of the income distribution considered, μ denotes the mean income, and in the last equality y_i, i = 1,2 refer to two independent copies of a random variable with distribution *F*.

The last mean-difference representation of the Gini is a most useful one. It gives the Gini coefficient as the mean of relative income differences in the population, if one introduces a conditional expectation

$$G(y) = (1/\mu)\, E\,(y_1 - y_2 \mid y_1 \geq y_2). \qquad (3)$$

Our second measure, $I_2(.)$, which is (half) of the coefficient of variation squared can be written in a similar form showing that it is sensitive to changes at the top end of the distribution[2]

$$I_2(y) = (1/2)Var(y)/\mu^2 = (1/2)E((y - \mu)/\mu)^2 = (1/2\mu^2)\, E((y_1 - y_2)^2 \mid y_1 \geq y_2), \qquad (4)$$

where y_i, $i = 1,2$ refer to two independent copies of a random variable with distribution F.

The third measure, $I_1(.)$, is the Theil entropy measure, which gives more weight to changes at the bottom of the income distribution

$$I_1(y) = E(y/\mu)\log(y/\mu). \qquad (5)$$

The Gini coefficient is decomposable by income sources (Lerman and Yitzhaki 1985). Let $y = \sum x_k$ then

$$G(y) = (1/\mu)E\,(\sum x_k(y_1) - \sum x_k(y_2) \mid y_1 \geq y_2) = \sum (\mu_k/\mu)E(x_k(y_1)/\mu_k - x_k(y_2)/\mu_k \mid$$

$$y_1 \geq y_2) = \sum (\mu_k/\mu)\, C(x_k, y), \qquad (6)$$

where $C(x_k, y)$ is the concentration coefficient of the variable, x_k w.r.t. the income variable, y.

2 Frequently it is found out that if the measures give same results qualitatively then the change in the value the Gini coefficient and the individual elements in the decompositions of the Gini coefficient are estimated more accurately if the comparison is based on the variation coefficients of the sample estimators.

A canonical decomposition of I_2 in terms of correlations and variances is obtained by writing

$$Var(\sum x_k) = \sum Cov(x_k, y) = \sum \rho_k \sigma_k \sigma, \quad (7)$$

where ρ and σ refer to the correlation coefficient and standard deviation, respectively. One gets,

$$I_2(y) = \sum (\rho_k \sigma_k/\sigma) I_2 = \sum \beta_k I_2 = \sum \rho_k (\mu_k/\mu) \sqrt{I_{2k}} I_2. \quad (8)$$

The coefficients β_k can be easily calculated by regressing each income source y_k by total income y. For the Theil entropy measure there is no canonical decomposition by income sources which can be expressed by using entropy measures of the income sources.

The above equations (6) and (8) can be used to interpret how inequality is affected by a *proportional* change in the income source x_k where all individuals are treated (proportionally) equally. The Gini elasticity formula introduced by Lerman and Yitzhaki (1985) needs a supplementary condition: The change is marginal in the sense that the original rank of observations w.r.t. the values of y are left unchanged. In particular, no ties in the values of y are allowed. Thereby, the initial ranking can be maintained.

$$\frac{dG(y)/G(y)}{d\mu_k/\mu_k} = (\mu_k/\mu)(C_k/G(y) - 1). \quad (9)$$

$$\frac{dI_2(y)/I_2(y)}{d\mu_k/\mu_k} = 2(\beta_k - \mu_k/\mu) \quad (10)$$

The elasticity formula shows that a marginal proportional change in the income source x_k has a tendency to increase inequality if the corresponding concentration coefficient is larger than the Gini coefficient for total income. Looking at the above implicit definition of the concentration coefficient (6), one notices that in this case the corresponding relative differences are generally larger in x_k than in terms of y. Similarly, in the case of I_2 a marginal proportional change in the income source x_k has a tendency to increase inequality if the corresponding β-coefficient is larger than the share of the income source in total income.

An alternative way to study income mobility examines transition (probability) matrices where the observations are grouped by income classes. The income classes are commonly defined by the values of the cumulative distribution function, for example, income quintile or decile groups. Many consider this as a natural starting point for studies of income mobility.

Transition matrices can be turned into indices of overall mobility. The mobility indices suggested by both Prais (1955) and Shorrocks (1978) *(PS)* and the one by Bartholomew (1982) *(B)*, are defined in terms of conditional transition probabilities, p_{jk}, the probability that an individual moves to class *k* conditional on initially belonging to the class *j*:

$$PS = \frac{m - \sum_j p_{jj}}{m-1}, \tag{11}$$

$$B = \frac{1}{m-1} \sum_j \pi_j \sum_k p_{jk} \mid j-k \mid, \tag{12}$$

where m is the number of income classes, and π refers to the initial income distribution. The index *PS* gives the average probability over all income classes of leaving the initial income class over the observation period, and *B* gives the mean number of income classes crossed by the individuals. In this paper we examine transitions across income decile groups. In this case with a relatively large number of income classes the Bartholomew index, *B* gives useful and somewhat more detailed information in comparison to the index *PS*.

Indices of overall mobility are naturally dependent on how we define the income classes among which the transitions are examined. In this study our emphasis is on equalisation of longer term income inequality and the transition matrices play a minor role. Although the matrices may reveal useful additional information on where in the distribution most mobility is occurring, we prefer using summary measures of income mobility which are based on underlying tried and well-behaving measures of income inequality.

3 Data

Our data which have been provided by Statistics Finland is built on a ten percent population sample covering the whole resident population in 2000. Extended sample for 1995–2004 is constructed by augmenting the base sample in 2000 both forward and backwards in time by ten percent samples from end of year target sub-populations which are composed of those responsible for changes in total population. For example, in 2001 the target population consists of those either born or immigrated to Finland in 2001. Similarly the target population in 1999 consists of those either died or emigrated from Finland in 2000.[3]

In the next stage Statistics Finland has collected for the sampled individuals register data on employment, income, and some demographics. All the data are collected from administrative registers covering the whole population in 1995–2004. Combinations of registers are made with the help of the personal identity code.[4] Register households are formed around each sampled individual with the help of combining individual register data with register data covering all housing units and their occupants in Finland.

Our income variables are obtained from the register data underlying the Finnish total statistics on income distribution (Statistics Finland 2006). They include the annual income of both the register households and the sampled individuals. The variables include the amount of annual income and its composition from different income sources, e.g. labour and capital income and also taking account of taxation and income transfers.[5] Using the sample we can form complete and incomplete panel data sets of non-institutional population for the time period 1995–2004 allowing dynamic income distribution analyses for population sub-groups with a reasonably large number of observations.

The variables in our data include household income with components describing gross income, wage income (employed), entrepreneurial income (self-employed) and capital income

3 Our total "target population" in 1995–2004 is 5 771 930 (with repeat-sampling included, see the next footnote) which corresponds to all who have been resident sometimes in Finland in 1995–2004. Note that it includes individuals living in institutions which we will subsequently drop.

4 Our sampling method should ensure representative samples of residents for each individual year, 1995–2004, as well as allowing formation of panel data sets over the whole time period covered. The nature of our sampling method leads to repeat–sampling of some individuals, e.g. for those persons who have, say first emigrated from and subsequently immigrated back to Finland. However, these individuals are identifiable by their personal identity codes.

5 In the absence of interview data, the concepts of our income data do not meet fully the national and international recommendations for income (Canberra Group 2001). For example we do not have access to some sources of capital income that are either tax-exempt (income from owner-occupied housing) or are currently taxed at the source, e.g. interests from bank deposits. The same applies to private transfers among households. Taxes paid and income transfers from the public sector are covered completely, transfers even in the case when they are tax-exempt.

of households, and the income transfers received and paid by households.[6] Factor income is composed of labour income, the sum of wage and entrepreneurial income, and capital income. Disposable income, which is the key concept in our analysis, is formed from these income components by summing factor income with transfers received and subtracting transfers paid by households. Economic conditions and inequality are examined using real disposable household income which has been equivalised accounting for differences in household size and composition. In calculating inequality each household member is assumed have access to an income level obtained by dividing total household income by an equivalence scale denoting the number of equivalent adults in the household. We use the OECD-equivalence scale which gives weight one to the first member in the household and gives weight 0.5 to each additional member in the household over 13, and 0.3 to those under 13 years of age.

The target population is private households. Institutional households and individuals with top-coded income data are excluded.[7] Top-coded income and deletion of these observations means that we cannot consider mobility in, out, or within the top income group. In light of Finnish experience with the dramatic increase in the top income shares, which do not show up in our data, and their influence on the increasing values of inequality indices, one would expect that observed increase in annual income inequality will be in our current data more moderate. Our total sample, excluding the top-coded observations, consists of 476 922 and 488 782 individuals in 1995 and 2004, respectively. For complete panels, covering years 1995–2004, 1995–1999 and 2000–2004, we have available 406 711, 441 224, and 421 437 observations, respectively.

6 The income sources that define disposable income are: capital income, labour (earned) income which includes both wage income (employed) and entrepreneurial (self-employed) income, income transfers received and income transfers paid. Capital income includes rents, dividends, taxable interest payments, private pensions and capital gains. Entrepreneurial income accrues to self-employed from agriculture, forestry and firms. Wage income consists of money wages, salaries, value of managerial stock options and compensations in kind, deducting work expenses related to these earnings. Income transfers received include, housing benefits and child benefits, unemployment and welfare assistance, unemployment and sick insurance and national and occupational old age, disability and unemployment pensions. Income transfers paid include direct taxes and social security contributions paid by the household members. The sum of capital and labour income corresponds to factor income. Adding income transfers received by the household gives gross income. Disposable income is obtained by deducting income transfers paid.

7 The basic population data are confidential. To guarantee the confidentiality of the individuals included in our sample Statistics Finland has top-coded all observations in the top one percent of the income distribution in each sample year. This has been done separately for labour and capital income. This operation renders these observations inoperable in the present analysis and we do not use them in our calculations. The effect due to their omission is to bias our measures of income inequality downwards.

The income data are collected from administrative registers covering the whole population and should be more accurate than, say data based on interviews, imputations and estimations as is commonly done in countries without access to register data, e.g. Chen (2009) and Gangl (2005). Panel data based on register data have an additional advantage the sample attrition is relatively low in comparison to survey data. Chen (2009) reports that the British Household and Panel Survey (BHPS) lost 54 percent of the sample from the first (1991) to the last (2002) wave. In our case the 1995 cross-section has 476 922 observations and the 1995–2004 panel has 406 711 observations, a loss rate of 15 percent over a ten year time period.

4 Results

Varying the time horizon for the 1995–2004 panel in calculating the rigidity index gives income stability profiles which show how the amount of observed stability depends on both the income structure and the length of time (Figure 1). Looking at the stability indices R_2 and R_1, based on (half) the coefficient of variation squared and Theil's entropy, the difference between R and one (mobility) is everywhere roughly double the corresponding difference (mobility) based on the Gini coefficient. Apart from the scale difference there is hardly any difference in the shape of the profiles. In addition we find little difference in the values of the indices R_2 and R_1. Using the Gini coefficient income inequality decreases by 11 percent when cumulated over five years and 16 percent when cumulated over 10 years. For the coefficient of variation squared and the Theil entropy index the corresponding figures are 24 and 32, and 23 and 31, respectively.

There is considerable income mobility in Finland, and the values of the mobility indices are in line with those reported in a recent study by Chen (2009) for the United States, Great Britain and Germany in the 1990's (see Table A2, p. 98). For example, the mobility values for the two years and five years time periods using Gini are 0.045 and 0.107 in the United States, 0.050 and 0.110 in Great Britain and 0.045 and 0.098 in Germany. In our panel the corresponding values are 0.052 and 0.110.[8] However, the usual caveats about comparability of income data remain.[9]

8 Gangl (2005) has utilized the European Community Household Panel (ECHP) data to study income mobility in 11 European Union countries during the second half of the 1990 over six annual survey interviews and to compare with the U.S. data. In four countries with low income inequality the mobility indices obtained the values, 0.150 and 0.34 for Denmark, 0.100 and 0.20 for Germany, 0.110 and 0.32 for Netherlands and 0.150 and 0.25 for Belgium using the Gini and Theil coefficients, respectively. In four countries with high income inequality the corresponding figures were, 0.07 and 0.16 for Ireland, 0.10 and 0.21 for Spain, 0.13 and 0.29 for Greece and 0.08 and 0.16 for Portugal, with countries ordered in ascending order with respect to annual income inequality. In addition, Gangl (2005) concludes that low inequality labour markets of Europe are no less dynamic than the high-inequality United States one, and cross-national differences in annual income inequality closely reflect cross-national inequality differences in permanent incomes measured over a longer period of time.

9 In the panel data used by Chen (2009) the sample attrition is higher, some income data are imputed or estimated, the data has been trimmed at both ends of the distribution (affecting 4.5 to 9 percent of data), and the adult equivalent scale used (square root of the total number of household members) is different from that in this study. In the ECHP data, used by Gangl (2005), the analysis is confined to population aged 25–55. The equivalence scale is comparable to that used in our study. However, Gangl (2005) reports that the results are not sensitive to the choice of the scale.

The Gini coefficient which is based on absolute income differences gives little weight to income changes in the tails of the distribution. Cumulating income over time will most effectively smooth incomes which are temporarily high or low and has less effect for relative incomes in the middle of the distribution. The robustness property of the Gini coefficient is often seen as a justification for preferring it to other income measures if only annual data is available since figures for the Gini coefficient will have less upward bias than the annual figures for other inequality measures (Shorrocks 1980). In the paper we will augment the analysis by considering inequality measures which give more weight to observations at the top end of the income distribution (I_2) and in the left tail of the distribution (I_1). Figure 1 suggests that mobility is higher at the tails of the distribution with no clear difference between the lower and high end.

Inequality and mobility in disposable and factor income

Movements in short-term income inequality and income mobility may reflect differences in macro-economic conditions. It is thus more appropriate to look at longer-term mobility. Figures 2–7 show values of inequality indices for individual years and cumulative incomes and values of the mobility indices for five year income panels starting in 1995–1999 using disposable income (Figures 2, 3 and 4) and factor income (Figures 5, 6 and 7). In the calculations we use the Gini coefficient (Figures 2 and 5), the entropy measure I_2, which is based on (half) the coefficient of variation squared (Figures 3 and 6) and the Theil entropy measure I_1, (Figures 4 and 7). In the Figures the top panel shows the values of the inequality measure for individual sample years for each income panel. The middle panel shows the corresponding values for cumulative income (time horizons from 2 to 5 years) in each income panel. Analogously, the bottom panel gives the values of the stability index.

Figure 2 shows that there is little to choose between the values of the Gini coefficient in different panels in overlapping sample year. There is a fast increase in the annual values of the Gini coefficient until 2000. After that the values seem to stabilise but we can see mild increase in 2003 and 2004. The observed time trend is in line with that observed in the Income Distribution Statistics reported by Statistics Finland, but the rise in inequality is here more moderate, because we had to delete those observations that were top-coded in our data. The middle panel shows that there has been a permanent rise in inequality. The values of the Gini coefficient for cumulated income have clearly risen. Income inequality is clearly not all transitory in nature, but the stability index will reveal if the observed rise in permanent inequality is a mere reflection of the time trend observed above. The bottom panel shows that the rigidity of incomes has been somewhat increased over our observation period. Using the Gini coefficient and weighting relatively more individuals in the middle of the income distribution, the rise in income inequality has not been due to transitory factors; rather, permanent income inequality has also increased and further, we find a moderate decrease in income mobility.

Figure 3 shows the results using the entropy measure I_2 which is based on (half) the coefficient of variation squared. The results stay qualitatively the same, but by weighting relatively more the high income individuals we see considerable year to year variation. For example in the 1995–2004 panel the value of I_2 is abnormally high in 1995. This is due to some outlying data and confirms the robustness property of the Gini coefficient.[10] The results using the Theil entropy measure I_1 are remarkably similar to those observed for I_2 (Figure 4).

Comparing the results for disposable income with those for factor income may give useful insight to the mechanism of public redistribution and changes in its operation. Figure 5 shows a tendency for relative inequality to increase as the individuals in a panel age. For example the panel starting in 1996 has a lower value of Gini in 1996 than the panel starting in 1995. In contrast to disposable income the annual values of the Gini coefficient do not show an increase in factor income inequality (Figure 5) in late 1990's. By definition cumulating incomes over time reduces inequality within an income panel.[11] If cumulative incomes are considered one can see a mild increase in equality but the rise is not very pronounced and anyway minor comparing to that observed in disposable incomes. Interestingly enough, there seems to be less mobility in factor income than in disposable income. The result runs counter to our intuition on the operation of income transfers and taxes as implicit insurance mechanism and automatic stabilisers in the economy (Figure 5). However, they are similar to the findings concerning market income in Denmark, Norway and Sweden by Aaberge et al. (2002).[12] Our data refer to the total population in Finnish households with a substantial portion of economically inactive households living on income transfers and by definition with a stable factor income. The results in the economically active subgroups of the population may be somewhat different. Finally, we find a mild decrease in the mobility of factor income over the sample period 1995–2004.

If the measure I_2 is used and higher incomes are weighted relatively more, we find a U-shaped pattern in factor income inequality in individual sample years (Figure 6). But there is more year to year and panel to panel variation than in the values of the Gini coefficient in Figure 5. Similarly, in cumulative incomes one observes a permanent rise in inequality over the sample period which is larger than that observed using the Gini coefficient. The Gini coefficient is more robust to high values of income and does not weight changes in the high end of the

10 Total statistics on income distribution was started in 1995, and income data in the first year are reported to be of worse quality than data in the subsequent years.

11 If the data were cumulated backwards from the last year both factors, age-effect and averaging, would operate in the same direction.

12 Note that Aaberge et al. (2002) define market (factor) income to include work-related transfers, such as unemployment insurance, sick pay and part-time pensions. In addition they assign income per adult member rather than conventional equivalised income. Aaberge et al. (2002) find substantial income mobility in Scandinavian countries which is comparable to or even above U.S. levels which has a high level of annual inequality.

income distribution as much as (half) the coefficient of variation squared. The difference may be due to some permanent change at the high end of our factor income distribution. However, these differences do not seem to affect our earlier conclusions on factor income mobility. In fact, the conclusions are strengthened, we see a clear decrease in factor income mobility if the high end of the income distribution is given relatively more weight.

If the measure I_1 is used and in turn the low end of the income distribution is given relatively more weight, we find a similar U-shaped pattern in factor income inequality in individual sample years (Figure 7). The above conclusions about increase in permanent inequality and decrease in factor income mobility hold. In our data weighting unequally the different parts of the income distribution does not seem to affect pictures of the evolution of permanent factor income inequality and income mobility.

Mobility and age

In the following we will compare the results of two five-year income panels covering years 1995–1999 and 2000–2004, respectively. The non-overlapping panels split the observation period in half and their comparison may reveal interesting temporal changes in inequality and mobility in 1995–2004. Table 1 presents the values of the mobility index based on the Gini coefficient for population subgroups consisting of individuals belonging to 5 year age intervals from 20 years of age to 74. Table 2 and Table 3 give the corresponding figures using the coefficient of variation squared and the Theil coefficient as the underlying inequality measure, respectively. In each column one can observe the results for two income panels starting in either 1995 or 2000. When the panels are started they are targeted to the same age groups. To observe temporal change in income mobility, keeping age constant one can compare the figures in the upper part of the table (income panel 1995–1999) with those in the lower part of the table (income panel 2000–2004). Note that though we follow individuals in our income panels the evaluation of their economic welfare is based on equivalised household income. Therefore evaluation is affected by changes in family size and its composition above the effects of unemployment, illness, retirement, good or bad luck, or macroeconomic events. Changes in family size and its composition are probably most important for both young and old, retired individuals.

It is frequently observed that income stability is increasing with age. Shorrocks (1980) examines mobility in labour incomes using Michigan panel data on income dynamics. For males reporting positive labour incomes in every year income stability increases with age, with the Gini mobility values are highest for the young, under the age 30 but are broadly similar for all groups above the age of 30.[13] For the young there is a dramatic decline in cumulated

13 On the whole the results for females with positive labour incomes are similar to those for men but increase in income stability with age more or less vanishes in the female sample. This suggests that transitory fluctuations are significant for female low earners well into middle age. Shorrocks suggests that this may be due to more frequent part-time or seasonal work among women. Interestingly enough, family income exhibits no more stability than male earnings.

income inequality after 5–6 years. In our 1995–1999 income panel, the stability in disposable income is lowest for the three youngest, 20–34 years old, age groups (Table 1 and 3). After that the values tend to stabilise and increase slowly until one gets to the retirement age when we see a further drop in income mobility (Table 1 and 3). In the 1995–1999 panel mobility is lowest in the three oldest age groups, those with individuals at least 60 years old in 1995, and, due to ageing, at least 64 years old in 1999.[14]

Income stability has increased in the 2000–2004 panel in all age groups and using all our three measures. The change from the 1995–1999 panel is largest in the two youngest age groups. In the two oldest age groups which are past the normal retirement age, there is hardly any change if the Gini coefficient is used. Because there has been a simultaneous decrease in mobility in the working age groups the values of the Gini mobility index are now in the age groups, 50–54 and 55–59 old at the same level as in the age group 60–64, using the Gini coefficient and giving relatively more weight to the observations in middle of the distribution. The results obtained by the Theil coefficient generally conform to those of the Gini coefficient (Table 3).

For the coefficient of variation squared which gives relatively more weight to the high end of the income distribution, we find a broadly similar pattern with highest mobility in the youngest age groups. However, there are some exceptions. In the 1995–1999 panel, the mobility is not uniformly decreasing with age. We observe a clear increase in income mobility in the age group 60–64 years old in 1995 and a decrease in mobility after that age (Table 2). Entering retirement seems to increase income mobility if we weight more observations at the high end of the income distributions. This may be due to the fact that high income individuals have low retirement income replacement ratios. Similarly as above, income mobility has decreased in the 2000–2004 panel in all age groups. But in comparison with the figures reported for the Gini coefficient we find that the coefficient of variation squared shows more mobility in the two oldest age groups, 65–74 years old in 2000, which are past the normal retirement age than in the age groups entering retirement age. Changes in family size and its composition are frequently responsible for relative rapid and large movements within the income distribution and may explain these differences.

If factor income is considered the results are generally similar to those above if the Gini coefficient is used. We find that income stability is lowest for the three youngest, 20–34 years old, age groups and a clear increase in income stability in all age groups if the 1995–1999 and 2000–2004 income panels are compared (Table 4). If the coefficient of variation squared is used we find some differences in the oldest, past retirement age groups. These may be due to large changes in factor income with a natural drop to zero in retirement with persons with no

14 Income mobility studies are rare for those over the conventional retirement age. Bardasi et al. (2002) find increased risk of low income incidence and mobility into low income for retired people in the UK. Naturally, this line of research has important policy implications.

income from invested capital. The figures for the Theil coefficient generally conform to those given by the Gini coefficient (Table 6).[15]

Top-coding and transition matrices

The above mobility analysis has been confined to the income panels which delete the observations that have been top-coded in our data by Statistics Finland. Deletion of these observations means that we are not able to consider mobility in, out or within the top income group. In light of Finnish experience with a dramatic increase in the top income shares, which do not show up in our data, and their influence on the increasing values of inequality indices, one would expect that observed increase in income inequality will be in our current data more moderate.

There is an additional complication, because top-coding has been done separately with respect to both labour income and capital income data. Therefore, top-coding affects a variable proportion of the data in the sample years.[16] To examine this we have used income panel data where the top-coded observations have been included as a special income class, to calculate income transition matrices in two five-year income panels starting in 1995 and 2000, respectively (Table 7). The income classes are based on deciles defined on the basis of equivalised disposable income, here we have implicitly assumed that the class of top-coded observations is included in the top, tenth income decile group.

Using a more extensive income panel and including the top-coded observations does not seem to affect our earlier conclusions about a general decrease in disposable income mobility. In particular, we find that in the time period 2000–2004 a whole 46 percent of our panel observations stayed in the lowest income decile group, whereas in the 1995–1999 panel the corresponding figure was 42 percent. At the top end of the income distribution we find that 55.3 percent of the observations stayed in the top decile group (including the top-coded observations) in the 2000–2004 panel whereas in the 1995–1999 panel 52.5 percent stayed in these classes. Interestingly enough we find that the probability of staying top-coded is rather high in our data, 66 percent stayed in this income class and 55 percent in the earlier 2000–2004 panel.

15 In calculating the values of the Theil coefficient we chose to impute some values for those with null factor income rather than drop them from the data. We used here a small positive value which is equal to the value (subsistance level) we used to truncate the values of disposable income from below. The calculations of the mobility indices, however, do not overly depend on the actual value chosen. The reason for this may be that in most cases affected (households with all members outside the labour force and no capital income) we treat equally the annual values (nominator) and mean values (denominator) in calculating the index.

16 The basic population data are confidential. To guarantee the confidentiality of the individuals included in our sample Statistics Finland has top-coded all observations in the top one percent of the income distribution, separately for labour and capital income in each sample year. To complicate things further, the year 1995 is affected rather differently from other years in our data. In 1995 top-coding affects a smaller proportion of observations than in other years, 0.9 percent of the observations in the income panel are top-coded whereas the corresponding figures vary from 1.6 to 1.8 in the subsequent years. In addition we find some high income observations which should have been top-coded under the general coding rule. These discrepancies may have affected some of our results. This motivates including a brief look at mobility by using transition matrices.

The last column gives the values of the Bartholomew index *B*. We have given separately for each row the mean number of income classes crossed by the individuals that were initially in that income class. The total value of the Bartholomew index, obtained by weighting the row values with the initial distribution, is given in the bottom row, is 0.170 for the 1995–1999 panel, and 0.158 for the 2000–2004 panel.

The index *PS* which gives the average probability over all income classes of leaving the initial income class over the five year observation period, has values 0.757 and 0.731 for the 1995–1999 and 2000–2004 panel, respectively. If the observations in the top-coded group and the tenth income decile group are merged into one class the corresponding values are 0.793 and 0.754. With reservations about comparability of income data, these values can be compared with those given in a recent study by Chen (2009) for Canada, the United States, Great Britain and Germany, for five year income panels over the time period 1990–2002.[17] In these countries about 70 percent or more of the population moved away from their initial income decile group. In Great Britain the mobility was for highest with values hovering around 75 percent.

Persistent inequality, decomposition analysis

Table 8 presents decompositions for the Gini coefficient of (real equivalised) disposable income separately for two five-year income panels starting in 1995 and 2000. The first column gives the value of the Gini coefficient for disposable income and the other columns give the corresponding decomposition terms for the sources of income. The values indicate the combined effect of the income share of the source and its concentration coefficient, see (6). Disposable income is additively composed of factor income (labour and capital income), and income transfers whereas direct taxes are counted using negative values, the last two components being relevant to the redistribution and income smoothing policies. In the time period 1996–1999 Finland experienced rapid economic growth with relatively high unemployment levels left from the Economic Crisis of the early 1990's. Simultaneously annual income inequality in Finland rose significantly. This shows up in our figures for annual income but the magnitude of the change is dampened here by the deletion of observations in the very top end of the income distribution. Among the top incomes the change has been particularly dramatic (Riihelä et al. 2005; Jäntti et al. 2009). One observes an increasing contribution in the column of labour income. In the period of rapid economic recovery, the increase in capital income, particularly among the well-to-do, has been accompanied by reductions in real benefit levels, particularly in those social transfers which guarantee minimum levels of social protection,

17 In the panel data used by Chen (2009) the sample attrition is higher, some income data are imputed or estimated, the data has been trimmed at both ends of the distribution, and the adult equivalent scale is different from that in this study.

see Riihelä et al. (2004).[18]

Comparing the results for 1995–1999 and 2000–2004 panels, we find that capital income although it represents in our (top-coded) data less than 5 percent of the equivalised disposable income has increased its contribution to overall inequality equally to that of labour income which represents for about 95 percent of equivalised household income. The increase in the mean annual values of the decompositions of the 1995–1999 and 2000–2004 panels are of same size as those observed in the decompositions of the five year cumulative means. This shows that increase in annual values of income inequality are transformed almost one-to-one into an increase in permanent inequality. The decomposition of the coefficient of variation squared gives similar results, qualitatively (Table 9).

The above decomposition terms reflect Gini correlation between the income component under consideration and disposable income (together with a measure of dispersion in the source, see 6). In the case of the coefficient of variation squared the correlation is the standard Pearson correlation coefficient, see (7). The decomposition of the inequality measure in sources of disposable income reveals only a part of the picture relevant for the redistribution and income smoothing policies. To give an example, negative (Gini or Pearson) correlation between income transfers and disposable income tells that those with low disposable incomes receive relative more of income transfers. Similarly taxes paid (counted as a negative number) are negative correlated with disposable income. Therefore, one should not be surprised that it is difficult to see any clear effects of taxation in the decomposition of the Gini-coefficient of disposable income (Table 8).[19] Indeed, conventional methods which aim at assessing the progressivity of taxation and changes in it, relate taxes with before-tax (gross) income whereas the above decompositions relate taxes with after-tax (disposable) income.

To look at redistribution and in particular progressivity of taxation by decomposition analysis one has to take before-tax (gross) income as a starting point (Table 10). The last column gives the value of the Gini coefficient for gross income and the other columns give the corresponding decomposition terms for the sources of income relevant to the redistribution and income smoothing policies. The Tables 10 and 11 are built in analogy with Tables 8 and 9. For example, the upper part of the table shows the results for annual income whereas the lower part of the table gives the corresponding figures for cumulative income sums.

18 Widening educational wage or employment differentials play a minor role and found little support in the Finnish experience even though the economy has experienced mass unemployment and dramatic restructuring of the economy in the 1990's. The history of collective bargaining marks the development of Finnish social security system. After the Economic Crisis of the 1990s, collective bargaining and economic policy rather shifted their focus from nominal wage increases and expanding social security provisions to income taxes reductions.

19 Comparisons of correlations of paid taxes with disposable income, as these decompositions implicitly do, are not informative. It tells more on the fact that after tax incomes are correlated with taxes paid and the taxation does not discourage earners too much. Extreme equalisation of incomes by taxation would end up with disposable income, being the final target in redistribution, being uncorrelated with taxes paid.

The change from 1995 to 1999 seems to be driven mainly by the change in the distribution of factor income (Table 10). The effect of capital income is shown separately since it accounts for 40 percent of the change but with less than 5 percent share in factor income. We find relatively little change in the decomposition terms referring to income transfers received from the public sector or to the direct taxes and social security contributions. After 2000 the pattern has been changed. Now the annual change in the decomposition term due to factor income is smaller than before whereas there is a change in the term referring to direct taxation.

Using the figures in Table 10 one can calculate two related summary indices, the first one introduced by Reynolds and Smolensky (1977) measures how much disposable income has been redistributed through taxation and the second one by Kakwani (1977) tells how the total tax burden is distributed. These indices for progressivity of taxation have lower values in the 2000–2004 panel than in the 1995–1999 panel. For example, the Reynolds-Smolensky progressivity index has annual mean values 0.0517 and 0.0469 for the 1995–1999 and 2000–2004 panels, respectively. A strong correlation between before-tax (gross) income levels and share of capital income offers an explanation. The observation is in line with previous empirical findings reporting a decline in annual progressivity of taxation, the effect of which is most pronounced among the top income earners (Riihelä et al. 2008). The decline in progressivity of taxation and the unprecedented increase in the share of capital income are reportedly important factors explaining both the increase in annual income inequality and top income shares in Finland.[20]

Comparing the results for cumulative means of annual income between the income panels shows that the change in the Gini coefficient of gross income seems to be a permanent one and not due to temporal year to year variation. More importantly, the above observations on the change in the progressivity of taxation seem to hold also in the figures for cumulative income and carry over to the concentration of disposable income. In mean incomes cumulated over five years the Gini coefficient is naturally smaller than the average of annual Gini coefficients. But the changes are equal in absolute values. We see a decline in the progressivity of taxation with respect to permanent income. For example, the change for the Reynolds-Smolensky progressivity index from 0.0506 to 0.0459 is almost equal to that in the mean of annual values. The corresponding change in the effect of public income transfers is much smaller.

20 The 1993 Finnish tax reform, introducing the Nordic dual income tax model, is one of key factors responsible for this trend. Differential taxation of labour and capital income created strong incentives to shift labour income to capital income for those in the highest marginal tax brackets (Lindhe et al. 2004; Pirttilä and Selin 2006).

5 Conclusions

Cross-sectional annual income distributions may give an incomplete and sometimes even distorted picture of longer-term economic well-being. The paper has examined Finnish income mobility and permanent income inequality and their temporal evolution using a very large income panel data in 1995–2004. First, we could verify that income inequality has increased over this time period. The observed time trend in the Gini coefficient is found to be in line with that in the Income Distribution Statistics reported by Statistics Finland, but the rise in inequality is here more moderate, partly because of some differences in data but also because we have deleted those observations that were top-coded in the data.

There is significant income mobility in the Finnish income distribution. Using the Gini coefficient income inequality decreases by 11 percent when cumulated over five years and 16 percent when cumulated over 10 years. The values we observe in the late 1990's were similar to those reported in Scandinavian and those European countries with relatively low level of annual inequality and even above the mobility levels in countries with relatively high level of annual income inequality. More importantly, the results revealed that income mobility has decreased in Finland in the time period 1995–2004.[21] The rise in income inequality as measured for example by the Gini coefficient has not been due to transitory factors, permanent income inequality in disposable income has also increased. In our data weighting unequally the different parts of the income distribution does not seem to affect the general picture of the evolution of permanent factor income inequality and income mobility. For example, using (half) the coefficient of variation squared, the results stay qualitatively the same but the decrease in income mobility is more pronounced in quantitative terms. This is due to giving more weight to observations at the high end of the income distribution.

Comparing the results for disposable income with those for factor income gave useful insight to the mechanism of on public redistribution and the use of transfers and taxes as implicit insurance mechanism and automatic stabilisers in the economy and changes in its operation. In contrast to disposable income, we found no increase in the annual values of the Gini coefficient for factor income in late 1990's. Interestingly enough, we found less mobility in factor income than in disposable income if the whole Finnish household population is considered. The results run counter to our intuition on the operation of transfers and taxes as implicit insurance mechanism and automatic stabilisers in the economy but are somewhat similar to those for Denmark, Norway and Sweden by Aaberge et al. (2002). In addition, we found some decrease in the mobility of factor income over the sample period 1995–2004.

21 Riihelä and Sullström (2002) is the only comparable study in Finnish income mobility. Using representative sample data which are based on (two year) rotating samples, they have concluded that with a two year time horizon, they could rule out an increase in disposable income mobility in the time period 1990–1999.

We found some variation in the results depending on the underlying measure of inequality. If the coefficient of variation squared is used and higher incomes are weighted relatively more, we find a U-shaped pattern in annual values of factor income inequality. In cumulative incomes one observes a permanent rise in inequality over the sample period which was more marked than that observed using the Gini coefficient. The reason for this is that Gini coefficient is more robust and does not weight changes at the top of the income distribution as much as the coefficient of variation squared. Most likely the differences are due to some permanent changes at the top end of our factor income distribution which were not revealed by the Gini coefficient. However, the differences do not seem to affect the conclusions on the decrease in factor income mobility over the sample period 1995–2004. In fact quantitatively, the conclusion is strengthened.

In our data income mobility is decreasing with age. Income mobility is highest in the three youngest, five year age groups, 20–34 years old. After that the mobility values stabilise and stay remarkably constant until one gets to the retirement age when we see a further drop in mobility. In all groups below normal retirement age we found a clear decrease in income mobility in the five year panel 2000–2004 in comparison with the panel 1995–1999. The change in mobility has been largest in the two youngest age groups. In the two oldest age groups which are past the normal retirement age, there has been hardly any change in mobility. Since there has been a general decrease in mobility affecting the working age groups, the mobility in disposable income in age groups, 50–54 and 55–59 old are currently at the same level as in the age group 60–64 old.

The data have been top-coded by Statistics Finland and our analysis of mobility based on inequality measures has been confined to income panels which delete these observations. Therefore, we have not been able to consider mobility in, out, or within the top income group. In light of Finnish experience with the dramatic increase in the top income shares, which do not show up in our data, and their influence on the values of inequality indices, one would expect that observed increase in income inequality will be in our current data more moderate. Because top-coding may have affected some of our results, we took a brief look at mobility by using transition matrices which do not require information on the exact income level.

Including the top-coded observations in matrix of income transitions does not affect our earlier conclusions about a general decrease in disposable income mobility. In particular, we find that in the time period 2000–2004 a whole 46 percent of our observations stayed in the lowest income decile group, in the 1995–1999 panel the corresponding figure was 42 percent. At the top end of the income distribution we find that 55.3 percent of the observations stayed in the highest decile group (including the top-coded observations) in the 2000–2004 panel whereas in the 1995–1999 panel the corresponding figure was 52.5 percent.

We used decompositions of the Gini coefficient and (half) the coefficient of variation squared by income sources to assess the effects of public redistribution on permanent income inequality. The decompositions of disposable income done separately for two five-year income panels in 1995–1999 and 2000–2004 show that capital income although it represents in our top-coded

data less than 5 percent of the total equivalised disposable income has increased its contribution to overall inequality equally to that of labour income which represents for about 95 percent of disposable income. Furthermore, the increase we observe in the mean annual values of the decompositions of the 1995–1999 and 2000–2004 panels are of same size as those observed in the decompositions of five year cumulative means. The increase in annual values of income inequality has been transformed almost one-to-one into an increase in permanent inequality.

Decomposition analysis of gross income, reveals that the decline in the progressivity of taxation between the income panels of 1995–1999 and 2000–2004 seems to be permanent and not due to temporal year to year variation. The change in the Gini coefficient of cumulated income over five years is equal to the average of annual coefficients. Similar observations hold for the effect of public income transfers. This may indicate that taxation and public income transfers have lost some of their effect as automatic stabilisers of the economy. However, the business cycle in the early 2000's may not be the severest test for the automatic stabilisers.

Our findings have some importance as income inequality in Finland rose significantly during the latter half of the 1990s. The period of major income equalization from the early 1970s to the mid 1990s has been reversed, taking the values of the Gini coefficient back to levels of inequality found 30 years ago. The recent rise in annual income inequality would be of no importance if it has been accompanied with a rise in mobility. In contrast, we found a decrease in mobility which has been largest among the youngest age groups.

Finland has been a prime example of interaction of political and labour market power (see e.g. Pekkarinen et al. 1992). The history of collective bargaining marks the development of Finnish social security system. After the Economic Crisis of the 1990s, collective bargaining and political exchange in formulating economic policy shifted their focus from expanding social security provisions to income taxes reductions and erosion in tax progressivity. The social norms and power have changed in the Finnish society. We have experienced an increase in permanent income inequality and a decrease in income mobility. The change is largest in the two youngest age groups, 20–29 old. Our results suggest that distribution of lifetime income has widened. A society with a rigid income distribution where everybody stays in the same position year after year is commonly regarded as inferior than a more mobile society.

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Tables and figures

Figure 1. *Income stability profiles for equivalent disposable real income by time horizon.*

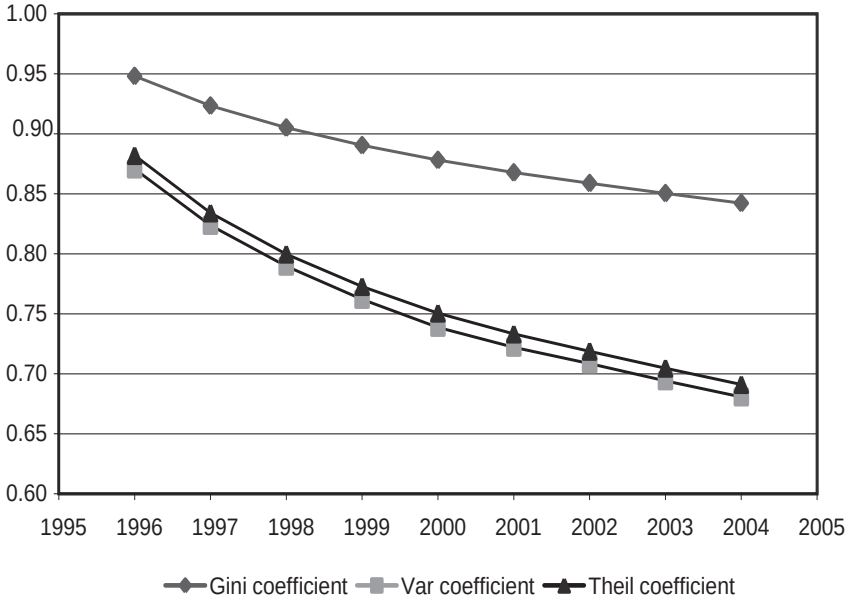


Figure 2. *Disposable income, Gini in 5-year income panels, cumulated income and stability.*

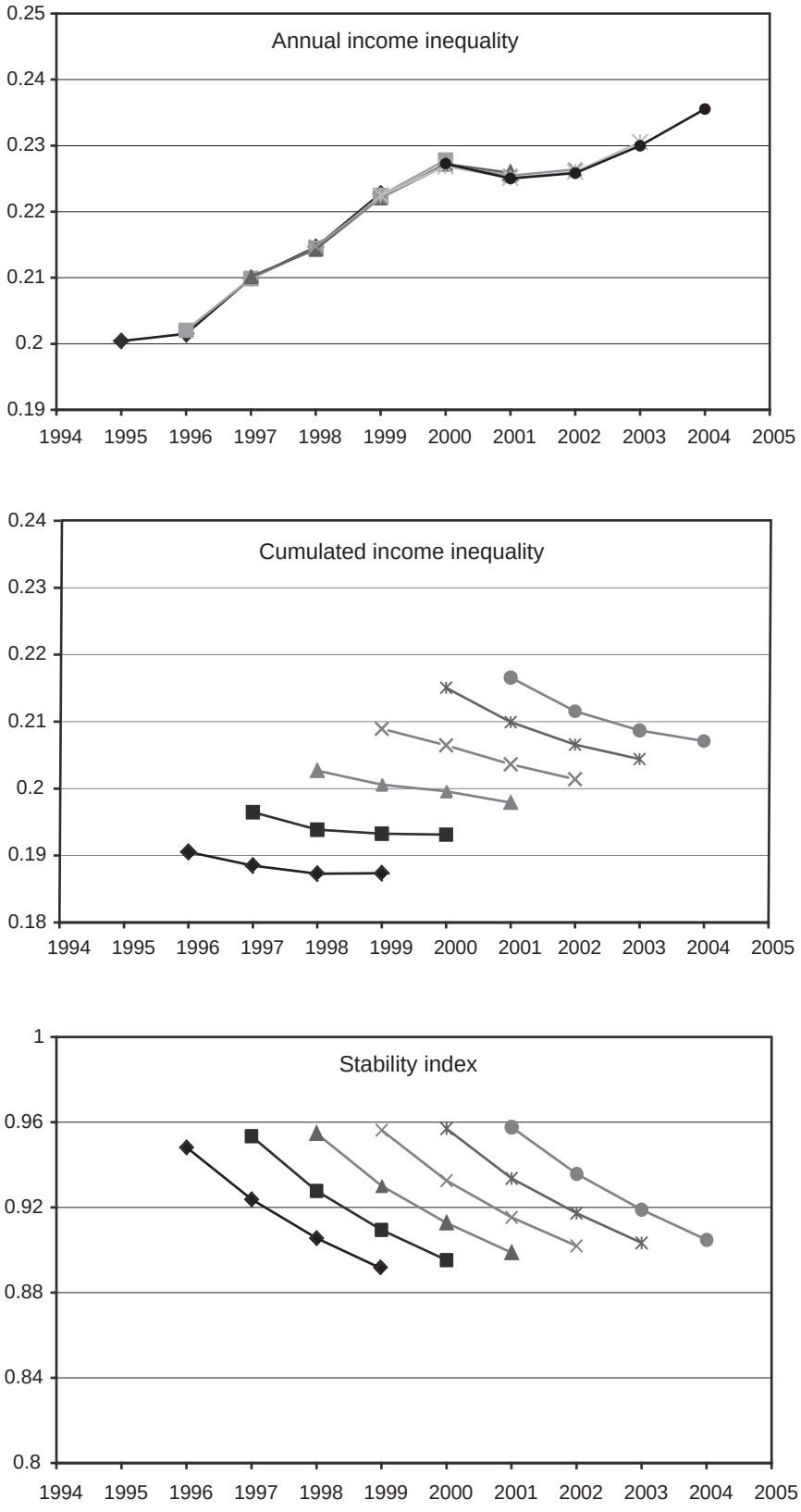
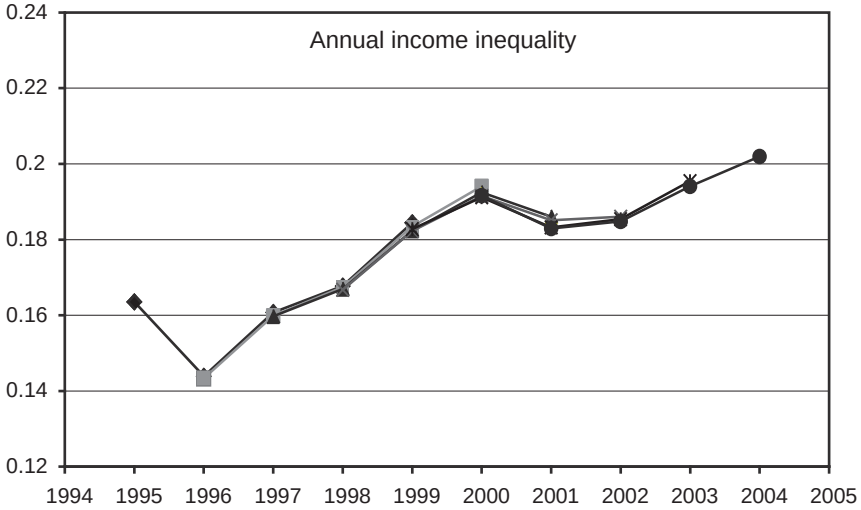
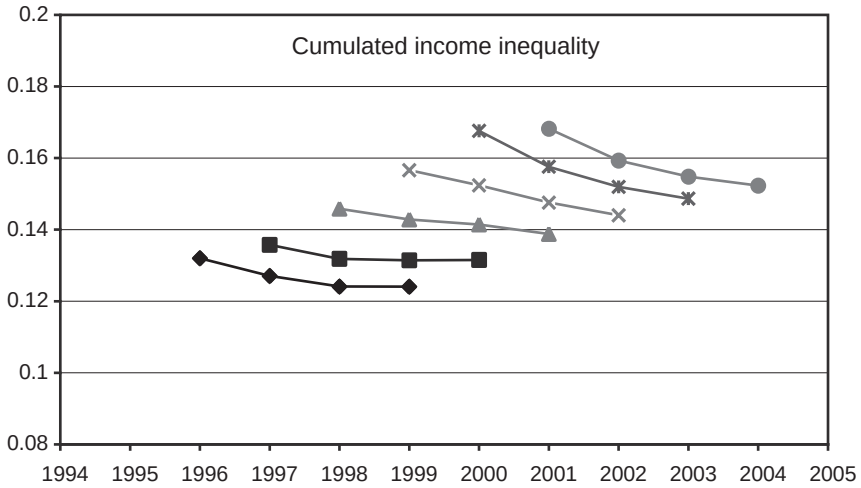


Figure 3. *Disposable income, index I_2 in 5-year income panels, cumulated income and stability.*





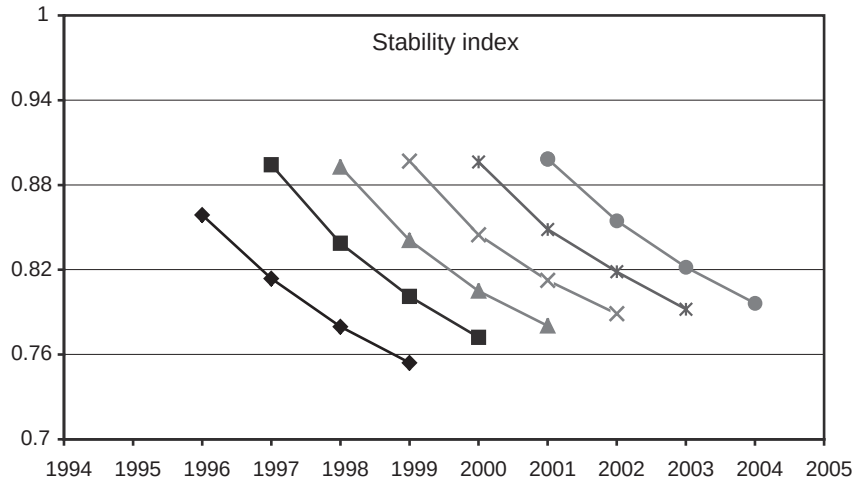


Figure 4. *Disposable income, index I_1 in 5-year income panels, cumulated income and stability.*

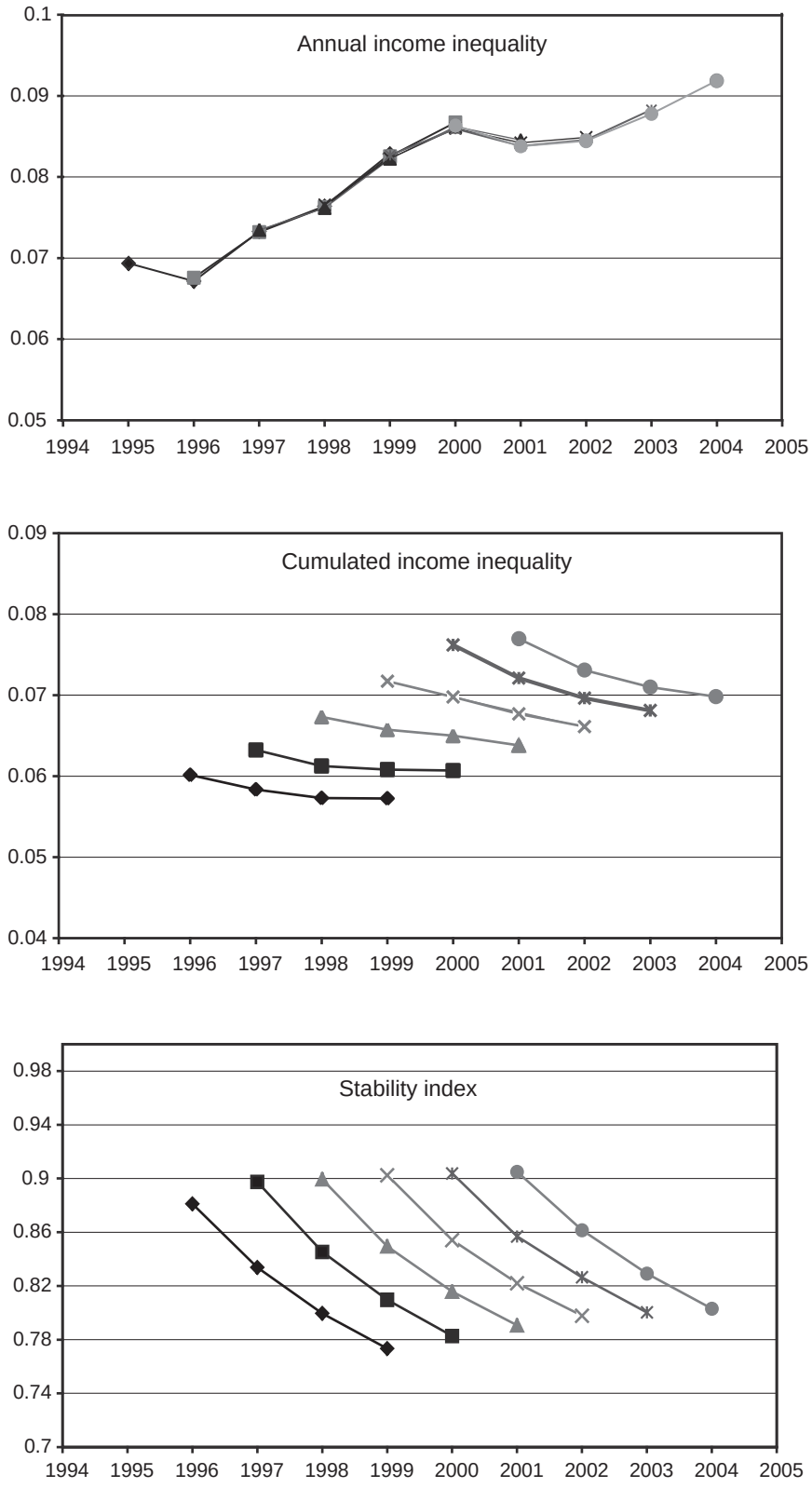


Figure 5. *Factor income, Gini in 5-year income panels, cumulated income and stability.*

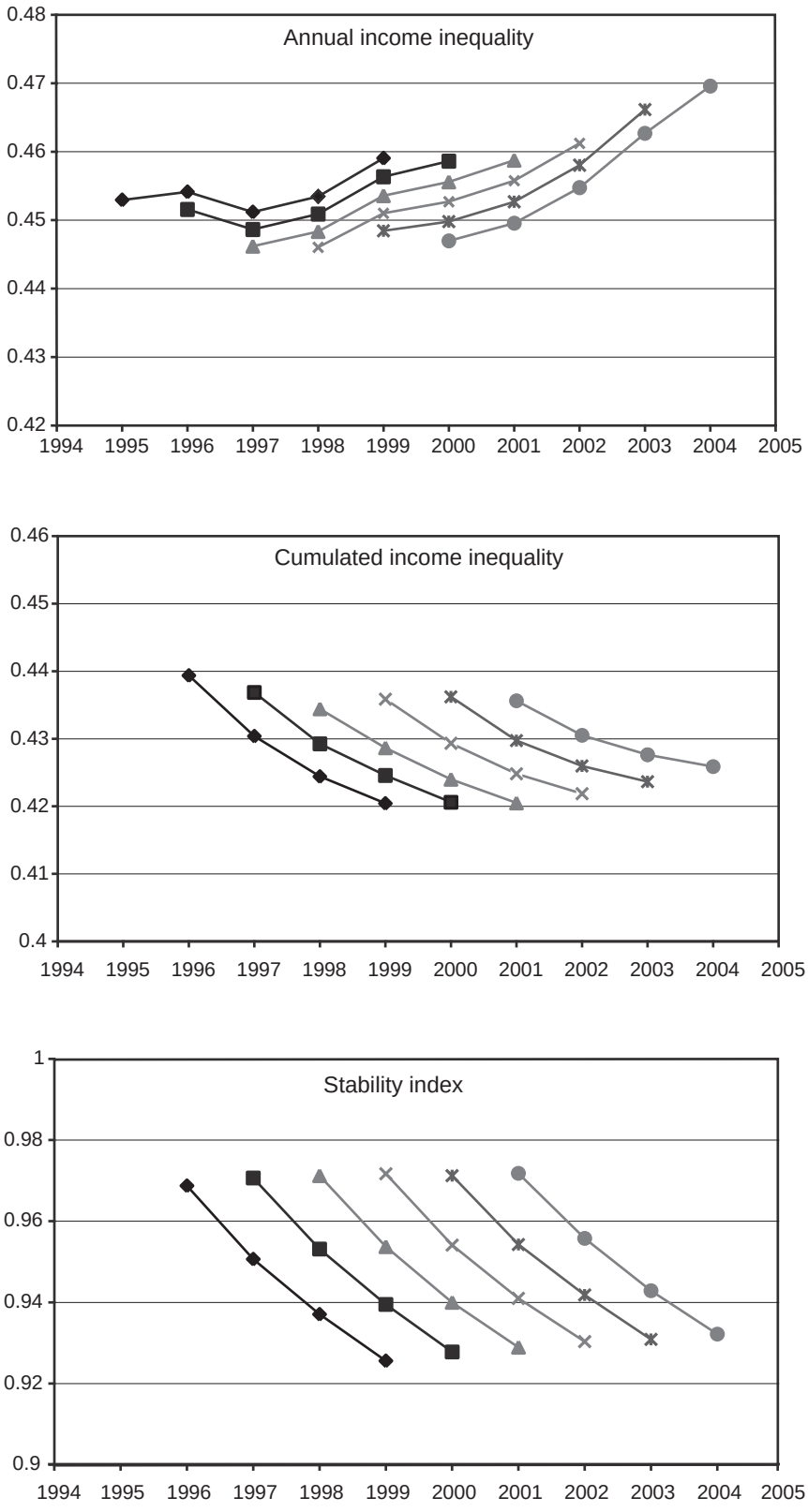
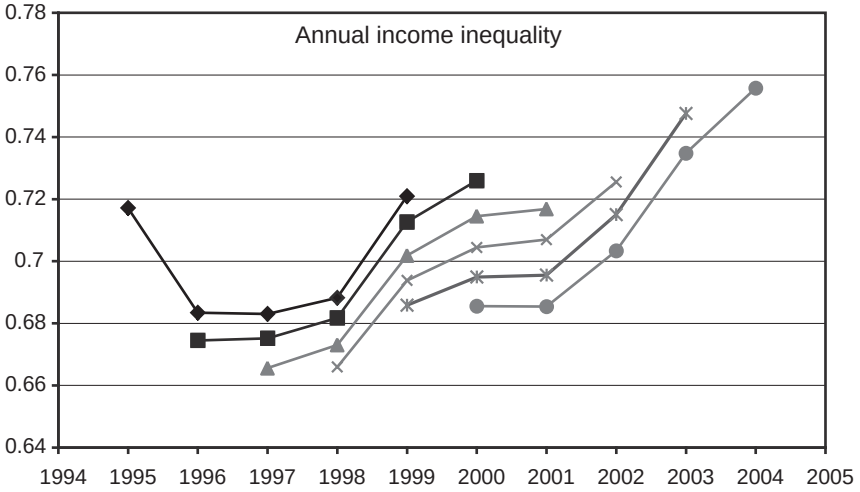
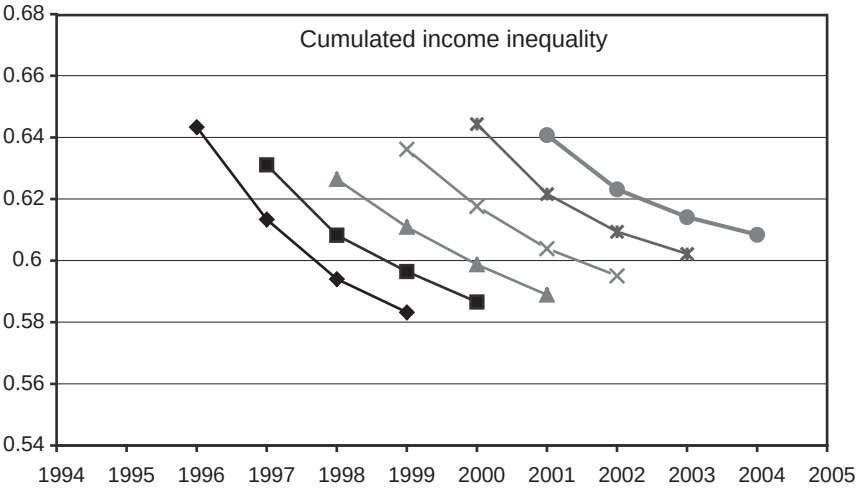


Figure 6. *Factor income, index I_2 in 5-year income panels, cumulated income and stability.*





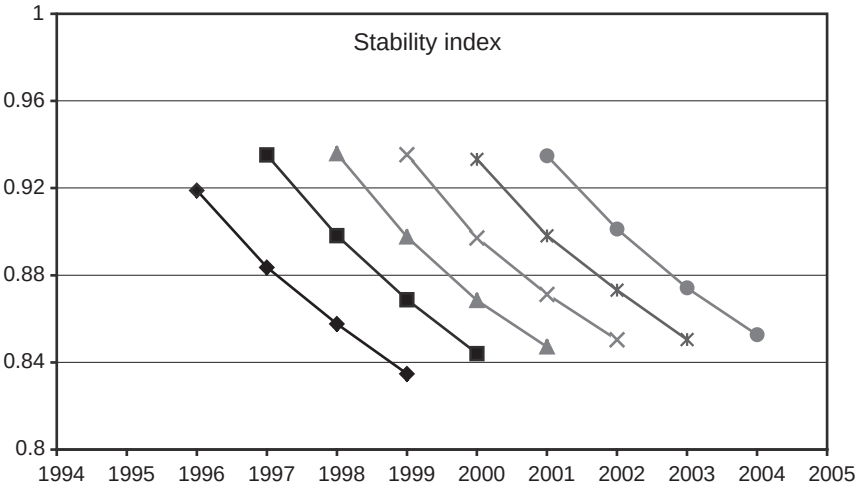


Figure 7. *Factor income, index I_1 in 5-year income panels, cumulated income and stability.*

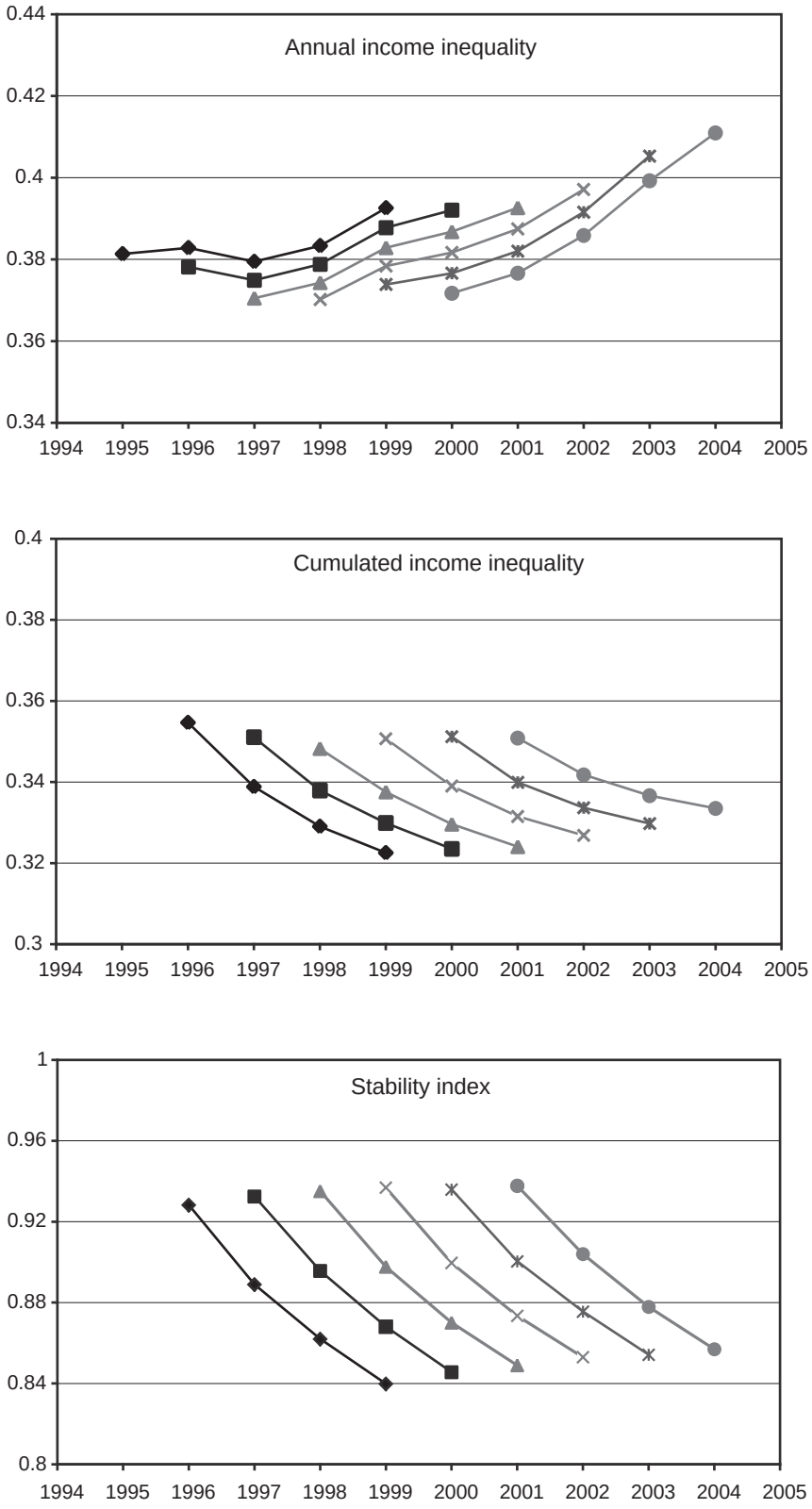


Table 1. *Income stability (Gini coefficient) in equivalent disposable income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.894	0.925	0.945	0.954	0.955	0.956	0.959	0.959	0.962	0.964	0.967
1997	0.842	0.890	0.920	0.932	0.934	0.937	0.941	0.939	0.943	0.946	0.953
1998	0.805	0.866	0.902	0.915	0.919	0.923	0.927	0.926	0.928	0.933	0.941
1999	0.777	0.849	0.888	0.903	0.907	0.912	0.917	0.915	0.917	0.923	0.932
2000											
2001	0.902	0.935	0.955	0.962	0.964	0.966	0.967	0.968	0.966	0.967	0.970
2002	0.854	0.904	0.932	0.942	0.945	0.949	0.952	0.953	0.949	0.951	0.954
2003	0.820	0.884	0.916	0.926	0.930	0.936	0.939	0.941	0.938	0.941	0.945
2004	0.795	0.868	0.903	0.913	0.917	0.924	0.928	0.930	0.927	0.934	0.936

Table 2. *Income stability (coefficient of variation, I_2) in equivalent disposable income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.791	0.828	0.864	0.868	0.879	0.886	0.877	0.892	0.804	0.881	0.839
1997	0.701	0.763	0.816	0.829	0.839	0.848	0.846	0.846	0.767	0.842	0.804
1998	0.640	0.722	0.780	0.801	0.811	0.820	0.817	0.819	0.749	0.785	0.786
1999	0.593	0.690	0.753	0.776	0.786	0.799	0.796	0.799	0.729	0.758	0.774
2000											
2001	0.806	0.859	0.886	0.906	0.915	0.914	0.913	0.918	0.901	0.893	0.890
2002	0.721	0.799	0.841	0.865	0.878	0.879	0.882	0.883	0.865	0.843	0.847
2003	0.663	0.760	0.809	0.832	0.849	0.852	0.854	0.858	0.844	0.824	0.823
2004	0.620	0.731	0.786	0.809	0.823	0.827	0.836	0.839	0.821	0.809	0.808

Table 3. *Income stability (Theil's coefficient, I_1) in equivalent disposable income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.792	0.840	0.876	0.892	0.895	0.898	0.902	0.906	0.904	0.910	0.910
1997	0.702	0.774	0.826	0.849	0.855	0.860	0.867	0.867	0.863	0.872	0.879
1998	0.640	0.732	0.792	0.818	0.825	0.833	0.840	0.840	0.834	0.841	0.856
1999	0.595	0.701	0.766	0.794	0.801	0.812	0.821	0.821	0.810	0.823	0.840
2000											
2001	0.804	0.864	0.899	0.913	0.919	0.921	0.926	0.929	0.921	0.918	0.919
2002	0.720	0.804	0.853	0.873	0.882	0.888	0.895	0.897	0.886	0.882	0.884
2003	0.663	0.766	0.821	0.841	0.854	0.862	0.871	0.874	0.865	0.863	0.863
2004	0.621	0.737	0.797	0.818	0.829	0.839	0.851	0.853	0.844	0.848	0.848

Table 4. *Income stability (Gini coefficient) in equivalent factor income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.918	0.942	0.957	0.966	0.970	0.972	0.973	0.972	0.972	0.974	0.979
1997	0.869	0.908	0.933	0.948	0.955	0.957	0.956	0.952	0.950	0.954	0.964
1998	0.832	0.884	0.916	0.935	0.943	0.945	0.944	0.938	0.935	0.942	0.955
1999	0.804	0.867	0.904	0.924	0.933	0.936	0.933	0.925	0.920	0.932	0.945
2000											
2001	0.916	0.943	0.960	0.968	0.972	0.974	0.975	0.976	0.973	0.971	0.975
2002	0.871	0.913	0.937	0.951	0.957	0.960	0.962	0.960	0.955	0.954	0.961
2003	0.838	0.892	0.921	0.937	0.945	0.949	0.949	0.946	0.939	0.942	0.950
2004	0.812	0.876	0.910	0.927	0.935	0.939	0.938	0.934	0.925	0.932	0.942

Table 5. *Income stability (coefficient of variation, I_2) in equivalent factor income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.837	0.875	0.900	0.916	0.928	0.933	0.926	0.932	0.857	0.859	0.815
1997	0.750	0.812	0.856	0.882	0.897	0.903	0.895	0.884	0.806	0.799	0.761
1998	0.685	0.770	0.825	0.857	0.875	0.881	0.874	0.852	0.772	0.746	0.737
1999	0.634	0.738	0.801	0.835	0.855	0.862	0.852	0.820	0.723	0.711	0.716
2000											
2001	0.835	0.883	0.909	0.930	0.940	0.941	0.943	0.941	0.919	0.868	0.862
2002	0.754	0.828	0.865	0.895	0.910	0.914	0.916	0.905	0.867	0.796	0.791
2003	0.696	0.788	0.836	0.868	0.888	0.892	0.885	0.875	0.823	0.760	0.758
2004	0.652	0.759	0.815	0.848	0.867	0.872	0.866	0.848	0.781	0.732	0.723

Table 6. *Income stability (Theil's coefficient, I_1) in equivalent factor income by age in five year income panels starting in 1995 and 2000.*

	Age in 1995/2000										
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
1995											
1996	0.825	0.870	0.898	0.919	0.927	0.932	0.932	0.930	0.925	0.919	0.927
1997	0.732	0.803	0.848	0.879	0.891	0.897	0.893	0.881	0.870	0.866	0.881
1998	0.668	0.758	0.816	0.851	0.867	0.873	0.867	0.847	0.833	0.834	0.853
1999	0.622	0.727	0.792	0.830	0.847	0.854	0.844	0.817	0.798	0.807	0.828
2000											
2001	0.826	0.878	0.910	0.927	0.935	0.940	0.944	0.942	0.931	0.917	0.920
2002	0.742	0.818	0.863	0.889	0.903	0.910	0.913	0.904	0.886	0.872	0.878
2003	0.684	0.778	0.831	0.861	0.879	0.887	0.884	0.872	0.848	0.841	0.849
2004	0.640	0.748	0.807	0.841	0.859	0.868	0.861	0.843	0.816	0.817	0.827

Table 7. *Transition probability matrices for equivalent disposable income in five year income panels starting in 1995 and 2000.*

	Top-coded	10. decile	9. decile	8. decile	7. decile	6. decile	5. decile	4. decile	3. decile	2. decile	1. decile	B-index
1995-1999												
Top-coded	0.661	0.195	0.068	0.033	0.016	0.011	0.007	0.003	0.002	0.003	0.002	0.006
10. decile	0.056	0.437	0.215	0.089	0.054	0.037	0.027	0.024	0.018	0.016	0.026	0.140
9. decile	0.018	0.158	0.289	0.206	0.111	0.069	0.046	0.035	0.024	0.019	0.024	0.166
8. decile	0.011	0.076	0.169	0.224	0.194	0.112	0.073	0.052	0.036	0.025	0.030	0.173
7. decile	0.007	0.046	0.106	0.151	0.199	0.186	0.110	0.075	0.050	0.035	0.035	0.175
6. decile	0.005	0.033	0.071	0.110	0.141	0.188	0.185	0.106	0.071	0.049	0.042	0.174
5. decile	0.005	0.024	0.050	0.073	0.106	0.141	0.196	0.184	0.102	0.065	0.055	0.172
4. decile	0.004	0.019	0.036	0.053	0.073	0.104	0.140	0.212	0.189	0.099	0.073	0.170
3. decile	0.004	0.015	0.027	0.039	0.051	0.071	0.101	0.143	0.260	0.184	0.106	0.165
2. decile	0.003	0.014	0.020	0.029	0.038	0.048	0.066	0.100	0.148	0.344	0.190	0.157
1. decile	0.005	0.029	0.030	0.033	0.038	0.046	0.056	0.073	0.103	0.165	0.421	0.206
2000-2004												0.170
Top-coded	0.549	0.186	0.083	0.047	0.032	0.024	0.019	0.019	0.014	0.011	0.016	0.021
10. decile	0.040	0.479	0.195	0.083	0.050	0.035	0.025	0.023	0.019	0.018	0.032	0.128
9. decile	0.015	0.181	0.318	0.180	0.100	0.064	0.044	0.032	0.022	0.017	0.026	0.158
8. decile	0.008	0.076	0.190	0.252	0.170	0.104	0.067	0.047	0.033	0.022	0.029	0.164
7. decile	0.006	0.045	0.111	0.172	0.225	0.164	0.101	0.067	0.045	0.031	0.033	0.165
6. decile	0.005	0.028	0.069	0.112	0.162	0.221	0.160	0.099	0.066	0.041	0.039	0.164
5. decile	0.003	0.020	0.045	0.076	0.112	0.155	0.232	0.157	0.091	0.058	0.051	0.162
4. decile	0.003	0.015	0.031	0.050	0.075	0.106	0.155	0.261	0.154	0.086	0.065	0.157
3. decile	0.002	0.012	0.024	0.033	0.047	0.071	0.103	0.149	0.306	0.160	0.093	0.152
2. decile	0.002	0.010	0.016	0.023	0.031	0.045	0.062	0.097	0.163	0.381	0.170	0.140
1. decile	0.002	0.014	0.019	0.024	0.031	0.036	0.050	0.068	0.103	0.188	0.464	0.163
												0.158

Table 8. *Decomposition of the Gini-coefficient for equivalent disposable income by income sources in five year income panels starting in 1995 and 2000.*

	Disposable income	Labour income	Capital income	Transfers	Taxes	Net transfers
1995-panel			Annual income			
1995	0.2004	0.3485	0.0155	-0.0268	-0.1368	-0.1635
1996	0.2015	0.3585	0.0093	-0.0236	-0.1427	-0.1663
1997	0.2099	0.3634	0.0144	-0.0309	-0.1370	-0.1679
1998	0.2147	0.3695	0.0183	-0.0314	-0.1417	-0.1732
1999	0.2228	0.3705	0.0267	-0.0320	-0.1425	-0.1745
Mean	0.2099	0.3622	0.0183	-0.0288	-0.1402	-0.1689
2000-panel						
2000	0.2273	0.3720	0.0302	-0.0306	-0.1443	-0.1750
2001	0.2250	0.3738	0.0209	-0.0311	-0.1385	-0.1696
2002	0.2259	0.3668	0.0218	-0.0288	-0.1339	-0.1627
2003	0.2300	0.3657	0.0241	-0.0286	-0.1313	-0.1599
2004	0.2356	0.3676	0.0285	-0.0309	-0.1297	-0.1606
Mean	0.2287	0.3692	0.0255	-0.0300	-0.1358	-0.1658
1995-panel			Cumulative sum of real income			
1996	0.1905	0.3432	0.0114	-0.0266	-0.1375	-0.1641
1997	0.1885	0.3404	0.0116	-0.0286	-0.1349	-0.1635
1998	0.1873	0.3387	0.0125	-0.0298	-0.1342	-0.1639
1999	0.1873	0.3366	0.0147	-0.0305	-0.1335	-0.1640
2000-panel						
2001	0.2166	0.3625	0.0240	-0.0313	-0.1387	-0.1700
2002	0.2115	0.3545	0.0221	-0.0305	-0.1346	-0.1651
2003	0.2087	0.3484	0.0217	-0.0299	-0.1316	-0.1614
2004	0.2071	0.3441	0.0222	-0.0301	-0.1291	-0.1592

Table 9. *Decomposition of the coefficient of variation (I_2) for equivalent disposable income by income sources in five year income panels starting in 1995 and 2000.*

	Disposable income	Labour income	Capital income	Transfers	Taxes	Net transfers
1995-panel			Annual income			
1995	0.1636	0.2385	0.0394	-0.0117	-0.1026	-0.1143
1996	0.1439	0.2469	0.0079	-0.0101	-0.1008	-0.1109
1997	0.1608	0.2649	0.0139	-0.0160	-0.1020	-0.1180
1998	0.1677	0.2731	0.0188	-0.0169	-0.1072	-0.1241
1999	0.1845	0.2866	0.0318	-0.0180	-0.1159	-0.1339
Mean	0.1641	0.2621	0.0237	-0.0144	-0.1056	-0.1200
2000-panel						
2000	0.1916	0.2909	0.0373	-0.0157	-0.1209	-0.1366
2001	0.1829	0.2908	0.0227	-0.0169	-0.1136	-0.1305
2002	0.1848	0.2872	0.0241	-0.0153	-0.1111	-0.1264
2003	0.1941	0.2946	0.0277	-0.0157	-0.1125	-0.1282
2004	0.2020	0.2992	0.0341	-0.0181	-0.1133	-0.1314
Mean	0.1911	0.2925	0.0298	-0.0163	-0.1144	-0.1308
1995-panel			Cumulative sum of real income			
1996	0.1320	0.2216	0.0149	-0.0113	-0.0933	-0.1046
1997	0.1271	0.2181	0.0116	-0.0125	-0.0901	-0.1026
1998	0.1241	0.2149	0.0113	-0.0131	-0.0889	-0.1020
1999	0.1241	0.2136	0.0128	-0.0135	-0.0888	-0.1023
2000-panel						
2001	0.1682	0.2692	0.0247	-0.0161	-0.1096	-0.1257
2002	0.1593	0.2569	0.0216	-0.0152	-0.1039	-0.1191
2003	0.1548	0.2490	0.0208	-0.0145	-0.1004	-0.1150
2004	0.1523	0.2436	0.0211	-0.0145	-0.0979	-0.1124

Table 10. *Decomposition of the Gini-coefficient for equivalent gross income by income sources in five year income panels starting in 1995 and 2000.*

	Capital income	Factor income	Transfers	Disposable income	Taxes	Gross income
1995-panel			Annual income			
1995	0.0108	0.2766	-0.0277	0.1414	-0.1075	0.2489
1996	0.0064	0.2779	-0.0257	0.1410	-0.1112	0.2522
1997	0.0101	0.2856	-0.0290	0.1497	-0.1068	0.2566
1998	0.0128	0.2919	-0.0298	0.1527	-0.1093	0.2620
1999	0.0191	0.2988	-0.0294	0.1597	-0.1097	0.2694
Mean	0.0129	0.2863	-0.0283	0.1489	-0.1089	0.2578
2000-panel						
2000	0.0214	0.3005	-0.0278	0.1627	-0.1100	0.2727
2001	0.0149	0.2998	-0.0290	0.1635	-0.1073	0.2708
2002	0.0157	0.2983	-0.0279	0.1654	-0.1049	0.2704
2003	0.0176	0.3009	-0.0276	0.1690	-0.1042	0.2733
2004	0.0211	0.3055	-0.0279	0.1741	-0.1035	0.2775
Mean	0.0184	0.3010	-0.0281	0.1670	-0.1061	0.2729
1995-panel			Cumulative sum of real income			
1996	0.0079	0.2681	-0.0273	0.1343	-0.1065	0.2407
1997	0.0081	0.2654	-0.0278	0.1336	-0.1040	0.2376
1998	0.0087	0.2642	-0.0283	0.1331	-0.1028	0.2358
1999	0.0102	0.2637	-0.0284	0.1335	-0.1018	0.2353
2000-panel						
2001	0.0170	0.2909	-0.0287	0.1564	-0.1058	0.2622
2002	0.0157	0.2850	-0.0283	0.1536	-0.1031	0.2567
2003	0.0155	0.2811	-0.0279	0.1522	-0.1011	0.2532
2004	0.0159	0.2788	-0.0277	0.1516	-0.0994	0.2510

Table 11. *Decomposition of the coefficient of variation (I_2) for equivalent gross income by income sources in five year income panels starting in 1995 and 2000.*

	Capital income	Factor income	Transfers	Disposable income	Taxes	Gross income
1995-panel			Annual income			
1995	0.0300	0.2572	-0.0158	0.1389	-0.1024	0.2414
1996	0.0068	0.2419	-0.0146	0.1254	-0.1019	0.2273
1997	0.0116	0.2579	-0.0185	0.1384	-0.1010	0.2394
1998	0.0155	0.2683	-0.0199	0.1436	-0.1048	0.2484
1999	0.0265	0.2914	-0.0204	0.1585	-0.1124	0.2710
Mean	0.0193	0.2636	-0.0178	0.1410	-0.1045	0.2455
2000-panel						
2000	0.0308	0.2975	-0.0177	0.1639	-0.1159	0.2798
2001	0.0193	0.2906	-0.0195	0.1603	-0.1109	0.2711
2002	0.0206	0.2899	-0.0186	0.1626	-0.1087	0.2714
2003	0.0238	0.2992	-0.0187	0.1701	-0.1103	0.2804
2004	0.0297	0.3073	-0.0200	0.1767	-0.1106	0.2873
Mean	0.0253	0.2969	-0.0189	0.1668	-0.1113	0.2780
1995-panel			Cumulative sum of real income			
1996	0.0122	0.2258	-0.0150	0.1165	-0.0942	0.2108
1997	0.0099	0.2189	-0.0154	0.1130	-0.0905	0.2036
1998	0.0098	0.2153	-0.0157	0.1110	-0.0886	0.1996
1999	0.0112	0.2148	-0.0158	0.1112	-0.0879	0.1990
2000-panel						
2001	0.0212	0.2719	-0.0181	0.1479	-0.1059	0.2538
2002	0.0188	0.2599	-0.0174	0.1417	-0.1008	0.2424
2003	0.0182	0.2528	-0.0168	0.1385	-0.0976	0.2360
2004	0.0185	0.2483	-0.0165	0.1367	-0.0951	0.2318