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Permanent income, redistribution and income risk: Empirical analysis on the role of age and social protection benefits (ESSPROS) using Finnish Panel data in 1995–2008*

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ABSTRACT

A large register based Finnish income panel data set with detailed information on the composition of income over a 14 year time period, in 1995–2008 is used to examine income risk and redistribution in the working age population, aged 20–59 years. In estimating relative risk premia in factor and disposable income, the level of education, socio-economic status and age are controlled for. The paper considers the extent of risk reduction due to the tax-benefit system which is measured by differences between risk premia of equivalised factor and disposable household income. The extent of risk reduction has decreased over the sample period. In the working-age population, social protection benefits have a positive role in reducing the difference in risk premia between factor income and disposable income while taxes have lost significance during the observation period. In addition, certainty equivalent income concepts are utilised to get some information on inequality in certainty equivalent income concepts and on redistribution of risk. Young adults, 20–29 years old and elderly, near retirement age 55–59 years old, seem to benefit most from social insurance. But all working age groups gain from redistribution in certainty equivalent income relative to unadjusted redistribution of cash. Redistribution of income risk has been reduced over the sample period. The findings are robust to a particular value of the degree of risk aversion assumed.

Key words: risk-premium, inequality, redistribution, age
JEL classification: D31, D63, H24, H55, I31, J14

1. INTRODUCTION

Annual income distributions may give an incomplete and sometimes even distorted picture of longer-term economic well-being. In a given year, people may have incomes which are transitorily high or low for reasons such as unemployment, illness, good or bad luck, or exceptional economic events. 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.” According to the above view, the recent rise in income inequality would be of less importance if it

had been accompanied with a rise in mobility.[1] This suggests that one should not measure annual, possibly transitory, change in inequality but the change measured over a longer (possibly life long) time span.

Neoclassical welfare analysis which underlies most income distribution studies and public economics is firmly anchored to static models under certainty. The analysis is somewhat lacking in established views how to incorporate dynamics and evolving uncertainty into inequality studies and models of optimal tax theory. How to introduce income mobility as an equalizer of longer term income into the social objective function (Fields 2010)? Have prospects of mobility some special merit over and above a mere comparison of static longer term (life cycle) income distributions?

More generally, income mobility may be viewed as a coin with two sides (Fields & Ok 1999). On one hand, mobility may reduce long term inequality. On the other hand, mobility means fluctuations in individual incomes. The shift in assessment from annual to multi-period inequality means that future uncertainty about incomes must be accounted for in the evaluation (Creedy & Wilhelm 2002). Faced with less than perfect capital markets, forward-looking, risk-averse economic agents view rise in income fluctuations as an increase in income risk which lowers economic well-being in comparison with a steady flow of income. Therefore, interest in mobility also raises the issue of predictability, or uncertainty. Uncertainty related to income fluctuations is a key dimension of income mobility. A completely mobile society would mean complete economic insecurity. How to combine income mobility both as an equalizer of longer term income and as an income risk modifier into a well-defined social objective function (Creedy & Wilhelm 2002 and Fields 2010)?

Economic welfare and inequality have many dimensions, wages, earnings, income and final consumption. Variability in, say, wages, is mediated by implicit social insurance and multiple mechanisms of self-insurance. First, the household can adjust supply of working hours. Second, joint earnings of the household are affected by public policies, progressive taxation, social insurance and transfers. Third, informal contracts and voluntary gifts between households lend added insurance. Fourth, the household can draw on their accumulated assets to temporarily finance consumption. Furthest in line are partial adjustments in replacements of durable goods and semi-

[1] In Finland annual income inequality rose significantly during the latter part of the 1990s (Riihelä, Sullström & Tuomala 2007, 2010). The period of major income equalization from mid 1960s to the mid 1990s has been reversed, taking the annual values of the Gini coefficient back to the levels of inequality found 40 years ago. In the Finnish case the phase of increasing income inequality has occurred much later than in the United States and in the United Kingdom, where annual income inequality has widened since early 1980s. 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).

durables. The last mechanism is particularly relevant for poor households often in the absence of simple credit market.

The present paper looks at the income risk and inequality of longer term certainty equivalent incomes which have been controlled for the undesirable effects of income fluctuations over time. What is the pattern of Finnish income risk? Has there been a change in permanent income inequality as annual income inequality has increased, and has the income risk been affected? How much income insurance does government provide? Are individuals of different age in the same situation? The paper illustrates how income panel data can be used to shed light on these and similar questions. In particular, the paper highlights that part of income smoothing which is provided by implicit social insurance rather than that affected by self-insurance (see also Carroll 1994, Carroll & Samwick 1998, and Hoynes & Luttner 2011).

The paper examines the dynamic income process of three different time periods in Finland, 1995–1999, 2000–2004 and 2004–2008 with large panel data sets of Finnish working age population, 20–59 years old. Relative risk premia of factor and disposable household income are estimated in a collection of population sub-groups defined by education level and socio-economic status, obtained in the first year of the panel. An effort has been made in separating income risk from the life-cycle effects on the income process by conditioning the estimators of relative risk premium on age.

The method used is a simple and straight-forward one, and should be considered as a first step in the analysis. One can have several choices for the reference (status quo) point for risk measurement. In this paper the average over a time span is used as a reference point, but it has alternatives. One may be based on the current income vs. future incomes, another reference may be based on a more sophisticated prediction of future incomes (possibly with a deterministic or stochastic trend) than the simple average, which is used in this paper. No effort is made to distinguish between idiosyncratic and predictable income risk which play an important role in precautionary saving motives. [2] Deaton (1992) provides for an analysis that the ability of individuals to self-insure is sensitive to the properties of labour income process and income uncertainty.

Creedy & Wilhelm (2002) and Creedy, Halvorsen & Thoresen (2011) come closest to the current paper in their method of taking (ex-ante) income uncertainty into account. In Creedy, Halvorsen &

[2] In the literature income risk (conditional variance) is divided into two components: risk to permanent income and risk to transitory income, see e.g. Blundell & Etheridge (2010). The permanent component of income is the persistent, stochastic trend of innovative income, while transitory innovation is defined as the deviation of income from the common trend. Income risk is here defined as unpredictability of income, not simply variability, and an income stream with high variance that is perfectly predictable would not be defined as risky. Therefore one needs to make assumptions about the information set on which individuals form predictions of their future income stream.

Thoresen (2011) the identification of the contribution of uncertainty is based on comparing actual incomes with estimates for predicted income of each individual, assigning their difference as a measure of uncertainty. Their estimations are based on an autoregressive model of log-income which allows, under log-normality, for closed form expressions for predicted income and use of the Atkinson index for a measure of inequality.[3]

First, the paper tests for the role of various categories of social benefits (ESSPROS 2012) in risk reduction where risk reduction is measured as the difference of the premia in factor and disposable income. Second, the role of income risk, is examined by comparing the age profiles of average income with the corresponding estimate of certainty equivalent income. Similarly, income inequality of the working age population in the three panels is evaluated by using the age profiles of the Gini-coefficient in certainty equivalent mean income.

Finally, this paper presents measures of redistribution of income by public tax-and-benefit programs, using the difference between the Gini coefficients of factor and disposable household income. Corresponding differences using between certainty equivalent income concepts give some useful information on redistribution of risk (an additional indicator of income insurance), and may be considered as adding to the literature.

The paper is organized as follows. Section 2 introduces the indicator of risk-aversion, the relative risk premium. The data are discussed in Section 3. The empirical results are presented in Section 4. Section 5 discusses and concludes.

2. METHODS

The paper gives estimates of average, longer term real income and observed risk premium in household income. Controlling the average income for the risk premium due to income fluctuations allows comparisons of average income with the risk-adjusted, certainty equivalent income concept and corresponding measures of inequality. [4]

[3] Atkinson index is of the same functional form as the constant relative risk-averse utility function which is used to calculate relative risk premia in the current paper. One could have followed their approach in choosing the measure of inequality to be of the same functional form and proceeding to consider income inequality along the lines in their paper. Instead one chooses the Gini-coefficient (and the underlying implicit social objective function), a robust measure of inequality.

[4] Neoclassical economic theory assumes that household utility is based on a flow of consumption not income. Therefore the risk premium should preferably be calculated in terms of consumption. Since there is available no data on

Assume that households have risk-averse preferences. They will prefer a certain income to a random income flow having the same average income over the period. Let the utility function for income y_t, be of the constant relative risk aversion (CRRA) form,

$$u(y) = y^{1-\rho}/(1-\rho), \qquad \text{if } \rho \neq 1, \text{ and}$$

$$u(y) = \log y, \qquad \text{if } \rho = 1. \tag{1}$$

Above ρ, $\rho > 0$, is the coefficient of relative risk aversion. Suppose that income is distributed randomly with a multiplicative shock X around a level $\bar{y}$, $y = \bar{y}X$. The equivalent risk premium (ERP) is defined by the amount ψ such that

$$u(\bar{y} - \psi) = \mathrm{E}[u(y)]. \tag{2}$$

The equivalent risk premium is the monetary value which household would be willing to forgo from the certain level $\bar{y}$ and still be as well off as with the random income flow, $y = \bar{y}X$.

For empirical studies a scale-less measure of relative risk premium is more useful, such as given by the relative equivalent risk premium (RERP),

$$\psi / \bar{y} = 1 - \frac{\left[\mathrm{E}X^{1-\rho}\right]^{1/(1-\rho)}}{\bar{y}}, \quad \text{if } \rho \neq 1, \text{ and}$$

$$\psi / \bar{y} = 1 - \frac{\exp(E \log X)}{\bar{y}}, \text{ if } \rho = 1. \tag{3}$$

Relative risk premium ψ shows the proportion of mean income that is "wasted" in utility terms because of risk aversion and income variation.

Utility over the time period considered is a sum, $\sum_t u(y_t)$, (with discount factor β, $\beta = 1$). This is an ex-post version of risk-averse preferences, suppressing income discounting.

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consumption, the analysis follows most of the literature in substituting corresponding income variables for average and actual consumption, see Carroll (1994), Carroll & Samwick (1998), Creedy et al. (2013) and Hoynes & Luttner (2011). In effect one assumes that households consume exactly their disposable income, due to capital markets constraints or other constraints which rule out buffer-stock savings and prevent the household from "smoothing out" the consumption over time.

The empirical calculations are made separately for several values of $\rho, (\rho = 1,\ldots,5,)$ the coefficient of relative risk aversion.[5] The relative equivalent risk premium (3), the income risk arising from the annual variation of income around the (five year) average income is estimated as the mean of individual risk premia over a stratum of the sample population. The classification of households is based on factors likely to affect labour market risk, the education level (6 levels) and socio-economic status (18 classes) of the sampled individual, in total 6*18 = 108 classes. To be more exact, for an individual in an age group *j*, with education status *k* and socio-economical status *l*,

$$1-\psi_{j,k,l} = \frac{\sum_i 1(i \in A(j))1(i \in E(k))1(i \in S(l))\left((1/T)\sum_{t=1}^{T} y_{it}^{1-\rho}\right)^{1/(1-\rho)} \Big/ (1/T)\sum_{t=1}^{T} y_{it}}{\sum_i 1(i \in A(j))1(i \in E(k))1(i \in S(l))}, \text{ if } \rho \neq 1 \text{ and}$$

$$1-\psi_{j,k,l} = \frac{\sum_i 1(i \in A(j))1(i \in E(k))1(i \in S(l))\exp\left((1/T)\sum_{t=1}^{T} \log y_{it}\right) \Big/ (1/T)\sum_{t=1}^{T} y_{it}}{\sum_i 1(i \in A(j))1(i \in E(k))1(i \in S(l))}, \text{ if } \rho = 1 \quad (4)$$

where $1(i \in A(j))$, $1(i \in E(k))$ and $1(i \in S(l))$ are simple, indicator functions.

Estimations are done separately for each income panel data sets, 1995–1999, 2000–2004 and 2004–2008, and each age groups, 0–4,…, 75–79 years old. [6] In the following step, the average household income of each individual is adjusted with the value of corresponding risk premium applicable to the population sub-group (panel, age group, level of education and socio-economic status) which the individual belongs to.[7]

[5] A conservative choice of ρ, the coefficient of relative risk aversion, $\rho = 1,$ would correspond to the logarithmic utility function. In the paper we discuss mainly the results with $\rho = 3,$ the same (plausible) baseline value as in Hoynes & Luttner (2011).

[6] In calculating the risk-premium the income variables have to take positive values. Therefore they have been bottom-coded with 120 € in annual real equivalised income (1995 prices). This has little influence on the measurements which use disposable income. However factor income is frequently observed with zero values, which may have some influence on the specific values one observes. Therefore the analysis is confined to the working age population.

[7] Each age-group is treated differently in an effort to separate income fluctuations corresponding to income risk from the life-cycle pattern in income. This also motivates using a relatively short time-spans, 5 years.

3. DATA

The data provided by Statistics Finland are built on a ten percent population sample drawn from the resident population in 1995–2008.[8] In the next stage Statistics Finland has collected for the sampled individuals data on employment, income, and some demographics. All the data are collected from linked administrative registers covering the whole population in 1995–2008. (Register) households are formed around each sampled individual with the help of combining individual register data with register data covering housing units and their occupants in Finland.

The target population is individuals living in private households. Those living in institutions and individuals with top-coded income data (the one percent of those having the highest incomes) are excluded.[9] Top-coded income data and deletion of these observations mean that we cannot consider income risk within the top income group. In light of Finnish experience with a considerable 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 than in official statistics. Using the sample we can form complete and incomplete panel data sets of non-institutional population for the time period 1995–2008 allowing dynamic income distribution analyses for population sub-groups with a reasonably large number of observations. Our total sample size, including the top-coded observations, is 503 982 and 521 819 in 1995 and 2008, respectively. For five year complete panels, covering years 1995–1999, 2000–2004, and 2004–2008 we have available 463 488, 440 275, and 474 304 observations, respectively.

The income data are collected from administrative registers covering the whole population and are more accurate than, say, data based on interviews, imputations and estimations as is commonly done in countries without access to register data, e.g. Jenkins (2011). Register based panel data have an additional advantage, as sample attrition is relatively low in comparison to survey data (see, Jenkins, in Ch. 4 2011). In our case the 1995 cross-section has 499 072 observations and the 1995–1999 panel has 463 488 observations, a loss rate of 7.1 percent over a five year time period, counting also those lost by top-coding, i.e. those belonging to the top one percent in any of the panel years.

[8] Our total "target population" consists of 5 978 470 individuals which corresponds to all who have been resident sometimes in Finland in 1995–2008. Note that our population excludes individuals living in institutions.

[9] The underlying 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. These observations are left out of the analysis. Their omission may bias our measure of income risk downwards.

The 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 households and the sampled individuals. The variables include the amount of annual income and its composition from different income sources, e.g. labour and property income and also taking account of taxation and public income transfers.[10]

The variables in the data include household income with components describing gross income, labour income, including wage income (employed) and entrepreneurial income (self-employed), property income of households, and public cash transfers received and paid by households.[11] Factor income is composed of labour income, the sum of wage and entrepreneurial income, and property income. Disposable income, which is the key concept in the analysis, is formed from the income components by summing factor income with cash 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.[12] In calculating inequality each household member is assumed to have access to an income level which is obtained by dividing total household income by an equivalence scale denoting the number of equivalent adults in the household. The (modified) OECD-equivalence scale gives weight one to the first member in the household, weight 0.5 to each additional member in the household over 13 and 0.3 to those under 13 years of age.

[10] 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 property income that are either tax-exempt (imputed net rent 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 cash transfers from public sector are covered completely, transfers even in the case when they are tax-exempt.

[11] The income sources that define disposable income are: property income, labour (earned) income which includes both wage income (employed) and entrepreneurial (self-employed) income, cash transfers received and income transfers paid. Property 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. Cash 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 property and labour income corresponds to factor income. Adding cash transfers gives gross income. Disposable income is obtained by deducting income transfers paid.

[12] Cost-of-living-index data (Statistics Finland) have been used to transform nominal annual values to real values, in 2008 prices.

Table 1. ESSPROS classification of social transfers by function.

1. *Sickness/Health care* Income maintenance and support in cash in connection with physical or mental illness, excluding disability. Health care intended to maintain, restore or improve the health of the people protected irrespective of the origin of the disorder.
2. *Disability* Income maintenance and support in cash or kind (except health care) in connection with the inability of physically or mentally disabled people to engage in economic and social activities.
3. *Old age* Income maintenance and support in cash or kind (except health care) in connection with old age.
4. *Survivors* Income maintenance and support in cash or kind in connection with the death of a family member.
5. *Family/children* Support in cash or kind (except health care) in connection with the costs of pregnancy, childbirth and adoption, bringing up children and caring for other family members.
6. *Unemployment* Income maintenance and support in cash or kind in connection with unemployment.
7. *Housing* Help towards the cost of housing.
8. *Social exclusion not elsewhere classified* Benefits in cash or kind (except health care) specifically intended to combat social exclusion where they are not covered by one of the other functions.

Our data include a classification of public cash transfers by the European System of Integrated Social Protection Statistics (ESSPROS 2012) which is utilised in the analysis.[13] In the European System of Integrated Social Protection Statistics social benefits are classified by function and by type. The type of benefit refers to the form in which the protection is provided, benefits in cash or, benefits in kind i.e. public provision of goods and services. The function of a social benefit refers to the primary purpose for which social protection is provided. The classification by function provides a useful classification of public transfers according to both the income risks and social protection which Government is covering and providing for. Eight functions of social protection are distinguished in the ESSPROS (Table 1).

[13] Social protection encompasses all interventions from public or private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs, provided that there is neither a simultaneous reciprocal nor an individual arrangement involved. The European system of integrated social protection statistics (ESSPROS) is a common framework developed in the late 1970's by Eurostat and the European Union Member States providing a coherent comparison between European countries of social benefits to households. ESSPROS is built on the concept of social protection, or the coverage of precisely defined risks and needs; it records the receipts and the expenditure of the organizations or schemes involved in social protection interventions. Receipts of social protection schemes are classified by type or by origin: the *type* gives the nature of, or the reason for a payment, and the *origin* specifies the institutional sector from which the payment is received.

Finnish Study Grant and a Housing Supplement cover for student funding and are not included in the ESSPROS categories but form an integral part of Finnish cash benefit system. In the paper the student benefits and Sickness Allowance benefits are used as additional categories of social cash benefits.[14] They are both provided by Kela (Social Insurance Institution), and are funded by the State and statutory contributions from employers and employees and self-employed.

The classification of socio-economic groups and education level divides the population into groups according to their social and economic characteristics.[15] To guarantee the confidentiality of the individuals included in our sample Statistics Finland has provided us with a classification of socio-economic groups and education at the top level where some original classes have been pooled together. For details, see the Appendix.

4. RESULTS

Risk premium, social benefits and taxation

The relative risk premia are estimated for factor, gross and disposable household (equivalent) income in a collection of population sub-groups defined by education level and socio-economic status, obtained in the first year of the panel.[16] Estimations are done separately for each five year panel data set, 1995–1999, 2000–2004 and 2004–2008, and for each five year age group in the working-age population, 20–24, …, 55–59 years old.

In the following, we focus on the results with $\rho = 3,$ the same baseline value as in Hoynes & Luttner (2011).[17] The relative risk premia of yearly factor and disposable income in the 2000–2004 panel, with the risk aversion parameter $\rho = 3,$ are shown in the Appendix. Table 2 reports the sample statistics of mean risk premia in the observation cells which relate to the above population subgroups. The estimated mean risk premia are about 20 and 7 percent of factor and disposable income, respectively. Preliminary analysis of the data showed that relative risk premia in factor

[14] Sickness Allowance benefits, provided by National Health insurance compensate employees for part of their loss of income

[15] Finland's Classification of Socio-economic Groups 1989 is based on the statistical recommendations issued by the UN for the 1990 Population Censuses although it does not fully comply with them. Socio-economic status is formed of several different classification criteria because there is no single criterion that would embody all the factors influencing the status of the person.

[16] Each age-group is treated differently in an effort to separate income fluctuations corresponding to income risk from the life-cycle pattern in income. This also motivates using a relatively short time-spans, 5 years.

[17] Results based on alternative values, $\rho = 1, \ldots, 5,$ are in a great majority of cases qualitatively similar to these and available on request.

income decrease as level of education increases and they are substantially lower for those whose socio-economic status is a worker or an employee than for those not working, in the first year of the panel, as expected.

The difference of risk premia in factor income and disposable income gives information on the extent of risk reduction produced by the public sector. The difference can further be partitioned into first, the difference between factor and gross incomes and second, the difference between gross and disposable incomes. The first one informs us about the risk reduction due to the (cash) benefit system and the second one relates to (direct) tax system.[18] The average amount of risk reduction seems to have decreased by two percentage points over the observation period, if panels 1995–1999 and 2004–2008 are compared. Further, the figures in Table 2 show that the observed decrease in the factor income risk has been more than countered with an increase in gross and disposable income risks. The decrease in factor income risk has been noticeable already in the panel 2000–2004. In contrast, the increase in gross and factor income risk is observable only if the last two panels are compared.

Next, one looks how the various categories of social benefits behave in risk reduction by examining their partial correlations with the extent of risk reduction, i.e. difference of risk premia of factor and disposable income. The observed variation in risk differences across population sub-groups is explained by adding to the regression model income shares of direct taxes paid and items in the basket of cash benefits, and testing for their inclusion in a simple descriptive model of risk reduction.

Typical results for the ESSPROS categories of social benefits are presented in Table 3.[19] The first thing to note is that in this regression, as in most others, all categories of social benefits enter the equation significantly and with a correct, positive sign; the exception is survivors' benefits, which are negatively related to income risk reduction. Therefore, it appears that at this level of aggregation the income shares of cash benefits (in the population sub-groups considered) are positively related to the general level of risk reduction achieved by the public sector. In addition, the results suggest that the different categories are by construction serving functions that do not overly overlap in the

[18] In Finland most social benefits are taxable. The notable exceptions to this rule are General Housing Allowance and Housing Allowance for Pensioners in the Housing benefits category) and Living allowance (in the Social exclusion category). Therefore ordering receipts of cash benefits before paying the taxes makes more sense here than in countries with tax benefit systems where most benefits are not taxable.

[19] Here a simple weighted regression is used with weights proportional to the number of individual observations in the population cell. The weighting reflects the fact that the precision in estimating risk premia in a cell as the mean over the cell observations is proportional to the number of observations in the cell. Furthermore, we drop those cells with less than 3 observations.

type of income risk, they cover for. If this would not be the case then some categories might well lose their significance.

It may be somewhat surprising to find out that the category, survivors' benefits, enters the equation with a negative, but significant sign. One plausible explanation is that those in the working-age are not the primary group targeted by these benefits and the positive effects of risk reduction are missed here, after controlling for all other benefits. However, survivors' benefits are not among major benefits; their share in disposable income is only under one percent. In addition, they are received by a small part of the population and it could well be that more generous survivors benefits are received by those population groups with less risk in factor income.

Our simple regression includes as additional terms Student benefits and Health insurance. Interestingly enough, the category, Student benefits enters with a correct sign. One would have expected similar problems than with survivors' benefits, since both categories have small average shares in disposable income and accrue to somewhat special population groups with presumably little factor income.

The variable, Taxes merits some further comments. It has the correct, risk reducing sign that one would expect from a progressive tax system that operates as an economy-wide automatic stabilizer. Interestingly, the significance of this variable has been lost in the period 2004–2008, simultaneously as its share in disposable income has been radically reduced. A concurrent decrease in the Reynolds-Smolensky progressivity of taxation measure has been found by decomposing the change in measure by the after-tax and before-tax income ratios and concentration coefficients in all income deciles in Finland (Riihelä, Sullström & Suoniemi 2008). The decrease has been affected most by changes at the high end of the income distribution.[20] Unfortunately a more detailed breakdown of the variable Taxes into capital, municipal and state (the progressive component of the tax system) taxes is not available in the data and the issue cannot be pursued further.

Table 3 shows the results where the variables controlling for level of education have been included to show that the results are robust to their inclusion and results do not change, qualitatively.

[20] The main factor that has driven up the top income shares in Finland since the mid 1990s is in an unprecedented increase in the share of capital income, and the 1993 tax reform is seen as one of the key factors responsible for this trend as top incomes have become more and more composed of dividend income (Riihelä et al. 2008). The 1993 Finnish tax reform, introducing the Nordic dual income tax model, created strong incentives to shift earned income to capital income for those in the highest marginal tax brackets (Pirttilä and Selin 2006). The dual income tax treats capital and earned income differently. In those income groups facing high marginal tax rates in earned income, capital income is taxed using much lower rate. A strong correlation between the level of before-tax income and share of capital income offers an explanation for the decrease in progressivity of taxation, if shifting from earned income to dividend income becomes more popular with higher income.

Controlling for socio-economic status does not affect the qualitative results regarding the significant variables, either. However, if the controls for the age-groups are entered, some coefficients become unstable. It may well be that some ESSPROS categories of social benefit functions are covering such special income risks which are more closely related to person's age rather than his socio-economic status or education level.

The above analysis ignores the redistributive components of social insurance. Next one looks into those and the redistribution of income risk within age-cohorts that is provided by public tax-and-benefit system.

Risk adjusted measure of permanent income and age

It has long been argued that distributions with income cumulated over a longer time horizon give a better picture of economic welfare and income inequality than distributions based on snapshot income. The age profiles of five year averages in factor and disposable income are shown among the working-age population in Figures 1 and 2, respectively. Generally, the age profiles stay relative flat from the early-thirties until the age group 40–44 years of age. After that the age profile rises more steeply in factor income until there is a decline in mid-fifties as people start to retire. Gradual, voluntary postponement of retirement age is likely to lay behind the temporal narrowing of the income gap between those in the age group, 50–54, and those in the group, 55–59 years old. As expected, the age profiles in average disposable income are substantially flatter than the corresponding profile of factor income.

Above the undesirable effects of income fluctuations over time have been neglected. [21] The shift of assessment to multi-period inequality and economic welfare would mean that uncertainty about incomes must be accounted for in the evaluation procedure. Faced with less than perfect capital markets, risk-averse economic agents view rise in income fluctuations as an increase in income risk which lowers economic well-being in comparison with a steady flow of income. The uncertainty aspect of income mobility is a key dimension of economic welfare. A completely mobile society would mean complete economic insecurity.

Therefore, emphasis is now shifted to examining incomes which will be controlled for the risk premium due to income fluctuations. In the calculations, the average equivalent income of each individual is adjusted with the value of corresponding risk premium applicable to the population

[21] Previously, we have examined Finnish income mobility from a positive point of view by considering the potentially beneficial effects of mobility on equalization of longer term income inequality (Suoniemi & Rantala 2010).

sub-group (defined by age group, education level and socio-economic status) which the individual belongs to.[22] Figure 3 compares the age-profiles of five year average real disposable income with the corresponding risk-adjusted, certainty equivalent income concept in panel 2000–2004. The difference between age-profiles reflects the value of risk aversion parameter chosen, $\rho = 3,$ and the difference is in the average equal to 1,580 € (7.7 percent relative risk premium) in equivalised household disposable income (in 2008 prices). This corresponds to the monetary value which the average working age households would be willing to forgo from a certain income level, and still be as well off as with the random income flow, they face. In these terms and with our assumptions in Finland the average risk in disposable income is of a reasonable size, if one considers the precautionary saving motives.

Next we compare the distributions of mean real income and with the corresponding risk-adjusted, certainty equivalent income. One may expect that the values of the Gini coefficient are somewhat higher in the case of risk-adjusted income variables, since they incorporate some of the original variation in income, though most of the individual variation has been smoothed out in the estimation of the risk premia over population sub-groups. But mathematically this does need not hold, since the reference point of the Gini coefficient, the mean is also changed, as one may observe in Figure 4. The values of the Gini coefficient of risk-adjusted, certainty equivalent disposable household income do not change noticeably in the working-age population; they are only 0.2–0.3 percentage points (about 1 percent) higher than those of average equivalised disposable household income. The difference is largest in the youngest and smallest in the oldest age-group.

As noted above, the risk premia in household factor income are considerably higher than in disposable income (Figure 5). In the 2000–2004 income panel data, estimations gave an average relative risk premium of 23.9 percent, equivalent to 5,580 € in equivalised household factor income, with $\rho = 3.$[23] In the working-age population, especially young adults and older age cohorts face more risk relative to others, and the mean values of risk premia in factor income range from 2,970 € (40–44) to 6,450 € (20–24 years old). There is substantial labour market risk in Finland, even after allowing for self-insurance by adjusting individual supply of working hours and family labour supply. The comparison of results for factor and disposable income clearly shows the (utility) scale

[22] Each age-group is treated differently in an effort to separate income fluctuations corresponding to income risk from the life-cycle pattern in income. This also motivates using a relatively short time-spans, 5 years.

[23] Results based on alternative values, $\rho = 1,\ldots,5,$ are in a great majority of cases qualitatively similar to these and the reader should consult Tables 4–5, in the Appendix. The figures for value $\rho = 0$ correspond to risk neutral preferences and no adjustment for risk and a conservative choice of $\rho,$ the coefficient of relative risk aversion, $\rho = 1,$ would correspond to the logarithmic utility function.

of income insurance by the redistribution programs consisting of social benefits and progressive taxation, and factor income risk of this magnitude is beyond those households' means which occupy the most risk-prone and low-income groups.[24]

In the case of disposable income the Gini coefficients of risk-adjusted, certainty equivalent household income were a little higher than those of mean disposable household income. In the case of factor income their roles are reversed. In the Finnish working-age population the values of the Gini coefficient of risk-adjusted, certainty equivalent factor income are 2–3.5 percentage points (almost 10 percent) higher than those of mean factor income (Figure 6). This means that those with lower factor income are at the same time exposed to more risk in factor income.

There has been no marked change in the shape of age-income profiles of the Gini coefficient, though the profiles show a steady income growth in the observation period 1995–2008 (Figure 7). The values of the Gini coefficient are generally highest in the income panel 1995–1999 (Figure 8). Subsequently, there has been a (within age-group) decrease in factor income inequality during the observation period. But in the 2000's, there has been hardly any change, with the exception of those in the group, 55–59 years old which is due to gradual postponement of retirement age. The observed temporal change in income inequality is in line with the corresponding change in unadjusted factor income. If the whole population is considered, the Gini coefficients of household equivalised factor income are 43.2, 43.4 and 43.6 percent, in the 1995–1999, 2000–2004 and 2004–2008 panel data, respectively, and stay remarkably constant in the sample period.

In contrast, there has been a substantial increase in the Gini coefficients of certainty equivalent household disposable income over the sample period with most of the change taking place between the 1995–1999 and 2000–2004 panels. The change has been more marked in the distributions of the youngest (20–24) and oldest (55–59) age cohorts (Figure 9).

Redistribution of income risk and income

Figure 10 shows, how the mean burden of the public net transfers underlying the redistribution programs is shared in the working age population. On the average, all age groups seem to be net payers until the mid-fifties, and the burden in €'s paid has been increasing (Figure 10). Note, that

[24] An early study by Shorrocks (1980) reported that comparison of family income with male earnings showed limited opportunities to self-insurance by family labour supply.

pensioners, which are not shown here, are the biggest gainers. This may explain, why net payments made by the working-age groups have increased on the average during the observation period. [25]

Figure 11 gives the corresponding risk-adjusted, $\rho = 3,$ figures for public net transfers. Comparison with the previous figure reveals, how both young adults, 20–24 years old and those near retirement age, 55–59 years old, seem to benefit most from implicit income insurance by public sector. However, all age groups which are shown here, show a larger gain from redistribution in certainty equivalent income in comparison to unadjusted redistribution in cash.

An established measure indicating how much redistribution does government achieve by public programs, cash benefits paid to households and household direct taxes (income taxes and employee social security contributions), can be calculated as the difference between the Gini coefficients of equivalised factor income (before taxes and transfers) and disposable income. Figure 12 shows this difference in risk-adjusted, $\rho = 3,$ certainty equivalent mean household income by five year age groups. Figure 13 reports the corresponding redistribution measure in unadjusted (five year) average equivalised income.[26]

Observed "redistribution within age groups" is considerably larger in risk-adjusted units of income.[27] The public sector operates a considerable income insurance mechanism, over and above the redistribution of average (five year) income. Surprisingly, the age profiles of (within group) income redistribution are quite flat over a large part of the working life. However, income redistribution effect jumps up at the near-retirement age group. The jump is no surprise since some persons in this age group have retired early and most pensioners receive almost all of their income from public transfers, and their factor incomes may be distributed quite unequally.[28] The remarkable temporal change affecting redistribution within the age group, 55–59 years old, is again due to the (voluntary) postponement of retirement age during the observation period.

[25] Since the different age groups are not of same size, the age profiles of mean net transfers do not reveal the total scale of net transfers paid by the working age population, and for example the relative size of the baby-boom generation is not displayed here.

[26] Figures 12 and 13 show redistribution within age groups whereas the Figures 10 and 11 show mean net payments and refer to redistribution between age groups (which is in part affected by group size).

[27] The Gini coefficients are calculated separately for each five year age groups. Therefore they miss redistribution between age groups. Thereby they provide a simple but crude method to control for trends that affect the size of birth year cohorts. On the other hand, this ignores the question, how redistribution is financed. Above Figures 10 and 11 show net transfers by other age groups, but cash transfers are also financed with other than household taxes, such as indirect taxes and corporate taxes, and there is a sizeable element of in-kind transfers in publicly-provided services, to be accounted for before the whole picture of redistribution is complete.

[28] In the age groups over 60 years old, the differences between the Gini-coefficients would get so large that the specific numbers are no longer informative. However, the observed temporal change is in line with the rest of the population.

More importantly, the data in average incomes point out that there has been a substantial cut-back in public redistribution from the late 1990's. For example, in the group, 35–39 old redistribution effects, as measured by the difference of Gini coefficients, of risk-adjusted equivalised household income were 16.9, 13,8 and 12,7 percentage points, in the 1995–1999, 2000–2004 and 2004–2008 income panel data, respectively (Table 6). In unadjusted equivalised household income the corresponding figures were 14.1, 11.8 and 10.6. Differences of these numbers, taken here as indicating redistribution of income risk, implicit income insurance by public sector, corresponds to 2–3 percentage points, or about 15–30 per cent of total amount of redistribution of equivalised household income, using relative risk aversion coefficient, $\rho = 3$. In the sample period redistribution of both (five year) average unadjusted and risk-adjusted household income has decreased by 3.5–4.0 percentage points (20–30 percent) if the 1995–1999 and 2004–2008 income panel data are compared (Table 6).

Above we have shown results for a baseline choice of the relative risk aversion coefficient, $\rho = 3$, as in Hoynes & Luttner (2011). Tables 4-6 give the results from calculations which vary the values of ρ, the coefficient of relative risk aversion. If a larger value is chosen, by definition the larger risk premium one gets. In the 2000–2004 income panel data, with $\rho = 1$ the average relative risk premium is about 8.9 percent (2,860 €) in equivalised household factor income, with $\rho = 5$ the risk premium rises to 20.9 percent (6,750 €, Table 5). In terms of equivalised disposable income the corresponding figures are 2.1 percent (600 €), $\rho = 1$, and 8.0 percent (2,250 €), $\rho = 5$ (Table 4).

Similarly the extent of implicit public income insurance is increased with the value of ρ. For example, in the 2000–2004 income panel data implicit income insurance, i.e. the difference between the redistribution of risk-adjusted ($\rho = 1$) and unadjusted income ($\rho = 0$) is in the mean 1.8 percentage points, and it rises to 2.3 with $\rho = 5$ (Table 6). If the change in the income redistribution from the 1995–1999 income panel data to the 2004–2008 income panel data is considered, the corresponding change increases slightly, with $\rho = 1$, the change (decrease) is 6.7 percentage points with values gradually increasing up to 7.3, with $\rho = 5$. If redistribution in mean income is considered, figures with $\rho = 0$ no risk, the average shows a 6.3 percentage points decrease.

In conclusion, income redistribution has been reduced in the sample period, and the result is not dependent on whether one considers risk-adjusted income measures or cash measure. Above one has found a decrease in factor income risk in the sample period. Although this may have reduced

the risk component in individual incomes the effect has not off-set the decrease in redistribution in cash.

The changes observable in Figures 12 & 13 hold for redistribution effects within tightly defined age groups (birth year cohorts), and do not tell the whole story about redistribution over the life-cycle. This may explain, why net payments made by the working-age groups have increased on the average during the observation period, although one found a decreased redistribution effect within the age groups. The paper has considered changes in risk reduction and redistribution of risk in five year age groups in the working age population. However, comparison of the adjacent age groups across panels reveals changes in a five birth year cohorts over a 10 year time span, since, for example those of 25–29 years old in the 1995–1999 income panel data will be 34–38 years old in the 2004–2009 panel data.

5. DISCUSSION

Neoclassical welfare analysis which underlies most income distribution studies and public economics is firmly anchored to static models under certainty. Income mobility is frequently seen to represent a positive element in society whereas income risk imposes costs to risk-averse households without access to perfect capital markets. How to introduce income mobility as an equalizer of longer term income into the social objective function, while simultaneously recognising the role of risk, is a demanding task (Fields 2010). The shift in assessment from annual to multi-period inequality entails that future uncertainty about incomes must be accounted for in the evaluation. This paper examined to what extent one can equate income mobility with income risk. Creedy et al. (2011) present a framework which comes nearest to the one used in the current paper. Here relative risk premia are estimated to adjust individual average incomes for risk aversion.

The paper looked at the inequality of longer term certainty equivalent (mean) incomes which have been controlled for the undesirable effects of income fluctuations over time. In income mobility studies the emphasis has been on the equalization of longer term inequality of mean income. To obtain reasonable estimates of risk premia, level of education, socio-economic status and age, factors likely to affect variability of income, are controlled for. A large number of observations available in the data facilitates this rather detailed procedure based on weak distributional assumptions. Naturally the results depend on the conditioning factors. Including more conditioning factors one tends to get more variation in the estimators of income risk. In the extreme case one

would equate all income variation at the individual level with income risk. But all income variation at the individual level is not to be equated with unpredictable income risk.[29] The method used is a simple and straight-forward one, and next step in the analysis would be to consider robustness of results to the chosen set of conditioning factors used to estimate income risk.

In the current paper an effort has been made in separating income risk from the life-cycle effects on the income process by conditioning the estimators of relative risk premium on age. This is an important aspect and life-cycle effects should be given a more thoughtful treatment in studies of income risk. In the future greater reliance on potentially volatile income sources in old age and increasing longevity makes it more likely that older people may observe substantial changes in their income.

The results look reasonable. The observed risk premia in household factor income were found to be considerably higher than in disposable income. One found a decrease in factor income risk together with an increase in gross and disposable income risks over the observation period 1995—2008. The income shares of ESSPROS categories of social protection benefits in cash and direct taxes paid entered the risk reduction (difference of risk premia of factor and disposable income) regression equations with significant and correct, positive signs with the exception of survivors' benefits.

Interestingly enough, additional terms, Student benefits and Health insurance also enter with a correct sign. The results are robust to the inclusion of controls for education levels and for socio-economic status. However, if the controls for the age-groups are entered, some coefficients become unstable. It may well be that the ESSPROS categories of social benefit functions are covering such income risks which are more closely related to person's age.

The variable, direct taxes (income taxes and social security contributions) has the correct, risk reducing sign that one would expect from a progressive tax system but the significance of this variable has been lost in the period 2004–2008, simultaneously as its share in disposable income has been radically reduced. This is in line with a previously found decrease in the Reynolds-Smolensky progressivity of taxation measure (Riihelä, Sullström & Suoniemi 2008).

Therefore, it appears that at this level of aggregation the income shares of social benefits (in the population sub-groups considered) are positively related to the general level of risk reduction produced by the public sector. In addition, the results strongly suggest that the different categories

[29] Creedy et al. (2011) estimate relative risk premia using three underlying parameters and relatively strong distributional assumptions, together with income in the initial period. The current paper utilises substantially more parameters (about 1000) to control for age, education level and socio-economic status in the initial period, together with mean income, and relatively weak distributional assumptions.

are by construction serving functions that do not overly overlap in the type of income risk, they cover for. If this would not be the case then some categories might well lose their significance. Remember that income risk reduction, i.e. reducing the variation of income, is considered here. A positive function of social benefits in maintaining income would presumably be more straightforward to find out.

Stiglitz and Youn (2005) have studied an 'integrated lifetime insurance pension program'. Under the integrated lifetime insurance pension an individual can use savings to provide cover for all income risks, e.g. unemployment, health and disability. They show that so long as the risks are not perfectly correlated then it pays to integrate all social insurance programs rather than to have separate insurance programs covering each risk. The gain of joint integration-having a common pool from which to draw upon—gets larger as the correlation gets smaller. The paper has presented strong indirect evidence that the ESSPROSS system of social benefits cover for specific, separate needs.

But note that the result holds for self-insurance. The possibility of pension-funded self-insurance does not eliminate the desirability of some tax-funded insurance, except under extreme circumstances (Stiglitz & Yun 2005). Additionally, I would like to remind that the Government provides a common pool of resources and is the borrower/lender of last resort which offers huge economies of scale and scope for any specific social benefit compared to what a pooling of separate insurance accounts would provide at an individual level.

In the paper one compared the distributions of mean real income and with the corresponding risk-adjusted, certainty equivalent income using the Gini coefficient. In the working-age population, especially young adults and older age cohorts face more risk relative to others. There is substantial labour market risk in Finland, even after allowing for self-insurance by adjusting individual supply of working hours and family labour supply, and the results indicate the (utility) scale of income insurance by the redistribution programs. In the case of disposable income the Gini coefficients of certainty equivalent household income were little lower than those of mean disposable household income. In the case of factor income their roles were reversed. In the Finnish working-age population the values of the Gini coefficient of risk-adjusted, certainty equivalent factor income are substantially higher than those of mean factor income which means that those with lower factor income are at the same time exposed to more risk in factor income.

There has been hardly any change in risk-adjusted factor income inequality and the result holds also for unadjusted factor income. In contrast, there has been a substantial increase in the Gini

coefficients of certainty equivalent household disposable income over the sample period with most of the change taking place between the 1995–1999 and 2000–2004 panels. The change has been more marked in the distributions of the youngest and oldest age cohorts.

Finally, the paper presented estimates on the redistribution effect using differences between Gini coefficients of factor and disposable household income. Risk-adjusted¸ certainty equivalent income concepts were used to get useful information on redistribution of risk, an additional indicator of income insurance, and may be considered as adding to the literature. All age groups, including old age people gain from redistribution in certainty equivalent income relative to unadjusted redistribution of cash.

The corresponding Gini coefficients of certainty equivalent factor and disposable household income depend on the degree of risk aversion assumed. However, the difference between these, an indicator of redistribution of income risk, is influenced less by the degree of risk aversion assumed. In addition, there has been a substantial cut-back in public redistribution in certainty equivalent income and the finding is robust to a particular value of risk aversion parameter assumed. Therefore, it is safe to conclude that the decrease in the mobility of disposable household income observed in Rantala & Suoniemi (2010) which could have shown as lowered income risk has not been large enough to off-set the effects of reduced redistribution in cash.

The paper considered certainty equivalent incomes which have been controlled for the undesirable effects of income fluctuations over time. The reference point in risk premium calculations was (observed) mean real income over the observation period. One can have several alternative choices for the reference (status quo) point for risk measurement. The reference point may be based on income in the first period, another reference may be based on a more sophisticated prediction of future incomes (possibly with a deterministic or stochastic trend) than the simple average, which is used in this paper. In a follow-up paper the present results are compared with those obtained by substituting in the calculations for the forward looking estimators of the dynamic income process (see, Creedy, Halvorsen & Thoresen 2013). In addition, income changes could be treated asymmetrically, and one may give relatively more weight to losses than gains (see, prospect theory by Kahneman & Tversky 1979). Furthermore, there is special merit in giving the risk of low-income spells and poverty a special status in a thorough dynamic analysis.

In neoclassical theory the effects of public policies are taken into account by forward-looking, rational economic agents while economic decisions on labour supply and savings are made. In measuring the extent of risk reduction by the public tax-and-benefit system the paper has used

actual values observed during a particular episode in Finnish economy. Construction of the counterfactual case of no public policies is a difficult problem, and the problem is frequently ignored in analysing income distribution and income inequality. The current paper is no exception to the rule. However, Hoynes & Luttner (2011) utilize matching across states to control for differences in state tax-and-transfer policies and decompose the total value of state tax-and-transfer programs into predictable changes in income and unexpected changes in income. The last effect is used to obtain an estimate of the insurance value of state tax-and-transfer programs in the United States. They find the total across person value of state tax-and-transfer programs as approximately 1,000 $ in 2005 dollars at the median real income, with $\rho = 3$. In the Finnish working age population the risk-adjusted monetary equivalent of total redistribution is in the mean (controlling for level of education, socio-economic status and age group) about 4,000 € larger in 2008 euros than the corresponding redistribution in cash. In Finland the in-cash tax-and-transfer programs are more extensive than the corresponding state programs in the United States (OECD, Social expenditure database, SOCX). Furthermore, the methodology differs significantly.

Accounting for saving and borrowing decisions is outside the available data. To uncover joint dynamics of income and consumption processes and to obtain more accurate measure of risk premium would be desirable. However, such panel data sets are mostly unavailable and most of the literature has resorted to using income data instead (Blundell & Etheridge 2010 is a notable exception to the rule).

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Table 2. Descriptive statistics.

	1995-99		2000-04		2004-08	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Risk premium in Factor income	0.2211	0.1453	0.2069	0.1369	0.2098	0.1514
Risk premium in Gross income	0.0779	0.0557	0.0785	0.0491	0.0832	0.0624
Risk premium in Disposable income	0.0660	0.0487	0.0687	0.0433	0.0727	0.0574
Difference in risk premium Factor-Dispos.	0.1551	0.1260	0.1382	0.1208	0.1371	0.1287
Difference in risk premium Factor-Gross	0.1431	0.1228	0.1284	0.1185	0.1267	0.1266
Difference in risk premium Gross-Dispos.	0.0120	0.0101	0.0098	0.0084	0.0104	0.0077
Sickness/Health care	0.0059	0.0054	0.0062	0.0057	0.0068	0.0061
Disability	0.0571	0.1160	0.0487	0.1058	0.0473	0.1090
Old age	0.0480	0.0748	0.0402	0.0619	0.0338	0.0477
Survivors	0.0086	0.0141	0.0070	0.0128	0.0053	0.0084
Family/children	0.0517	0.0423	0.0392	0.0303	0.0373	0.0284
Unemployment	0.0659	0.0737	0.0495	0.0676	0.0456	0.0632
Housing	0.0103	0.0136	0.0106	0.0155	0.0109	0.0175
Social exclusion	0.0069	0.0118	0.0061	0.0120	0.0060	0.0137
Student	0.0080	0.0091	0.0056	0.0078	0.0045	0.0071
Health insurance	0.0159	0.0127	0.0148	0.0108	0.0162	0.0116
Taxes	0.4292	0.0883	0.3838	0.0773	0.3518	0.0748
Obs. in cells	303.557	544.378	350.853	588.781	357.897	587.628
Number of cells	862		754		745	
Number of observations	261 666		264 543		266 633	

Notes: Risk premia are calculated with the coefficient of relative risk aversion, $\rho = 3$. Benefits measured as share in mean disposable equivalent income.

Table 3. Estimation results from a weighted regression for difference in risk premium.

Premium difference	1995-1999		2004-2008	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Sickness/Health care	1.3357***	0.4135	1.9010***	0.3714
Disability	0.3176***	0.0164	0.3708***	0.0206
Old age	0.8348***	0.0384	0.8623***	0.0428
Survivors	-0.5151**	0.2497	-0.9372***	0.2626
Family/children	0.2798***	0.0713	0.6708***	0.0918
Unemployment	0.6489***	0.0164	0.8465***	0.0193
Housing	1.3025***	0.2620	0.8677***	0.2103
Social exclusion	2.5615***	0.2121	1.7808***	0.1937
Student	2.3641***	0.1604	2.8422***	0.1748
Health insurance	1.5635***	0.1952	0.5645***	0.1839
Taxes	0.0791**	0.0368	0.0307	0.0419
Upper secondary level	0.0075	0.0032	0.0023	0.0030
Post-secondary before 2000	0.0091	0.0041		
Lowest level tertiary	0.0030	0.0058	0.0022	0.0041
Lower-degree level tertiary	0.0053	0.0079	0.0069	0.0052
Higher-degree level tertiary	-0.0026	0.0072	0.0018	0.0063
Doctorate level tertiary	-0.0081	0.0179	0.0015	0.0139
constant	-0.07594	0.02034	-0.04177	0.01815
R-squared	0.9475		0.9581	
root MSE	0.0336		0.0276	
Cells	862		745	
Sum of weights (Obs.)	261 666		266 630	

Notes: Dependent variable: Difference between risk premium in factor and disposable income, calculated with the coefficient of relative risk aversion, $\rho = 3$, weighted regression with (cell) weights equal to the number of observations in the cell. *** p<0.001, ** p<0.01, * p<0.05. * denotes significance at the 5 per cent level.

Figure 1. Average (five year) equivalised household factor income and age in 1995–1999, 2000–2004 and 2004–2008.

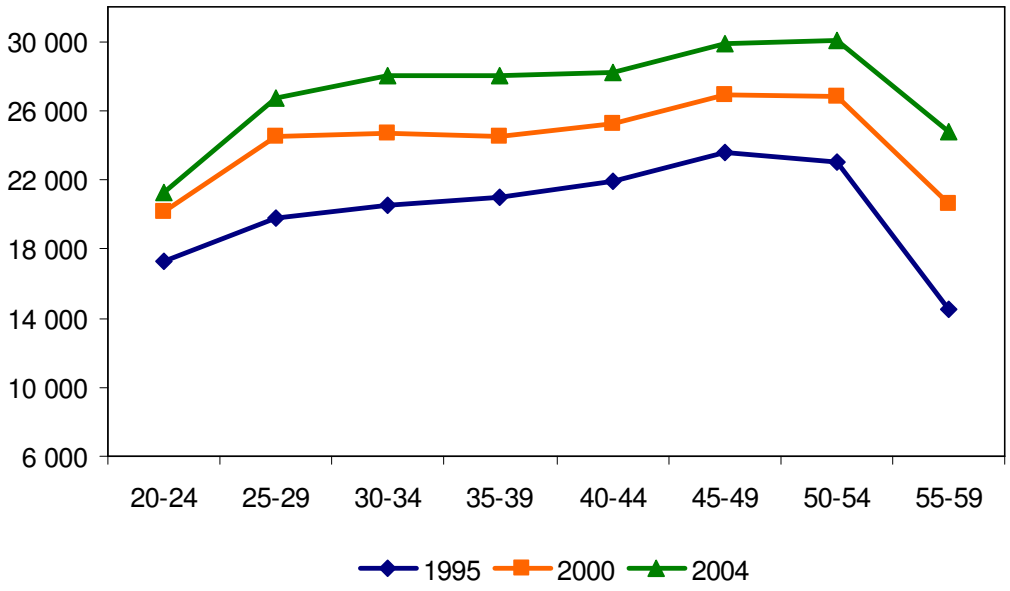


Figure 2. Average (five year) equivalised household disposable income and age in 1995–1999, 2000–2004 and 2004–2008.

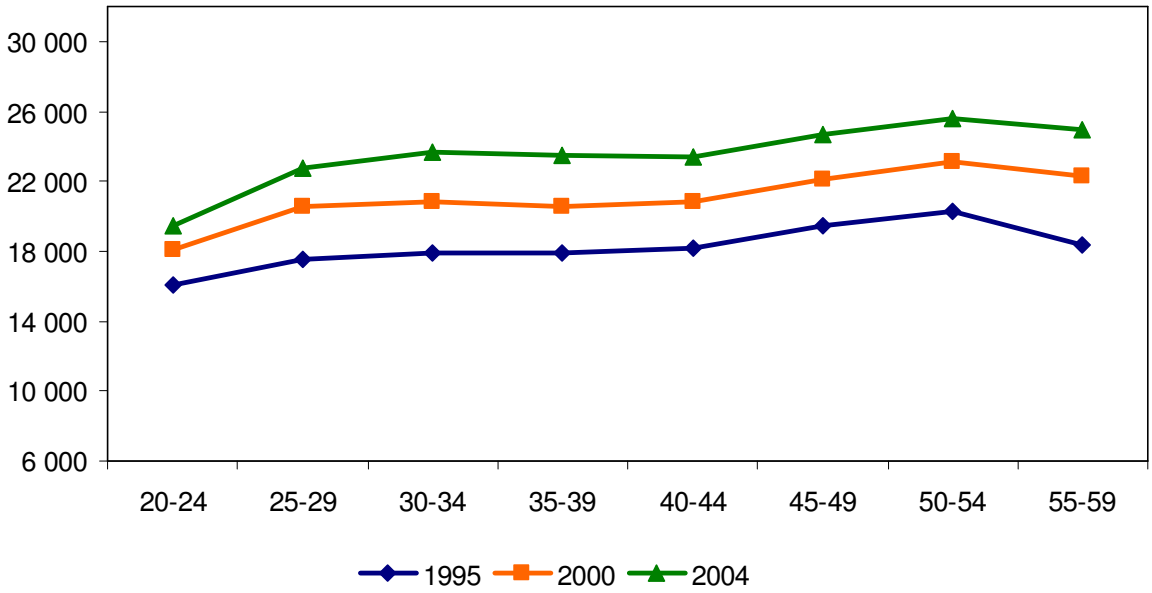


Figure 3. Average (five year) equivalised household disposable income and risk-adjusted disposable income, $\rho = 3$, and age in 2000–2004.

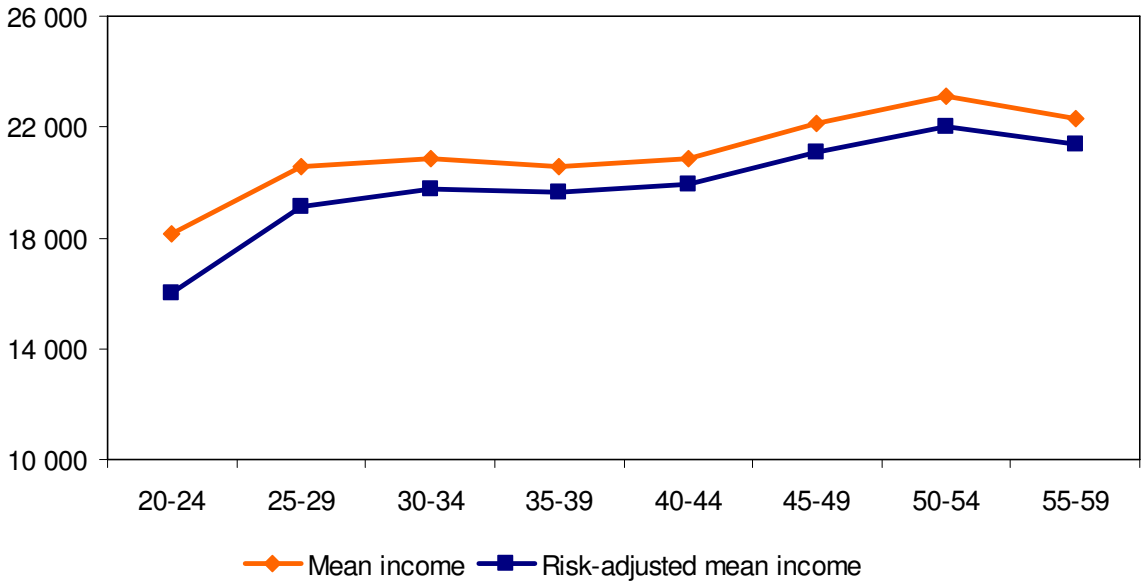


Figure 4. The Gini coefficients of average equivalised household disposable income and risk-adjusted income $\rho = 3$, and age in 2000–2004.

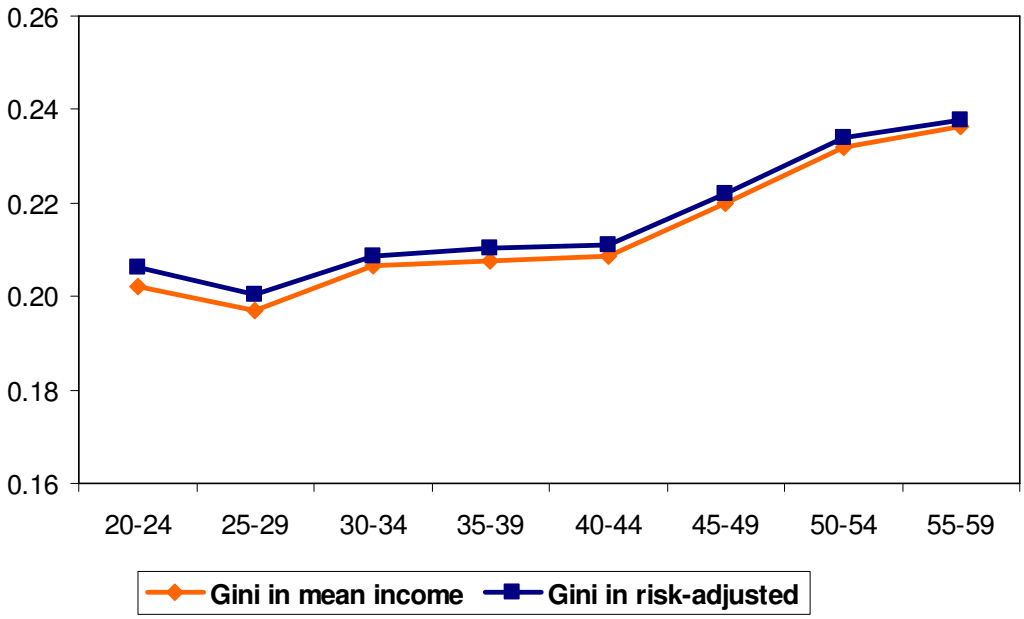


Figure 5. Average (five year) equivalised household factor income and risk-adjusted factor income, $\rho = 3,$ and age in 2000–2004.

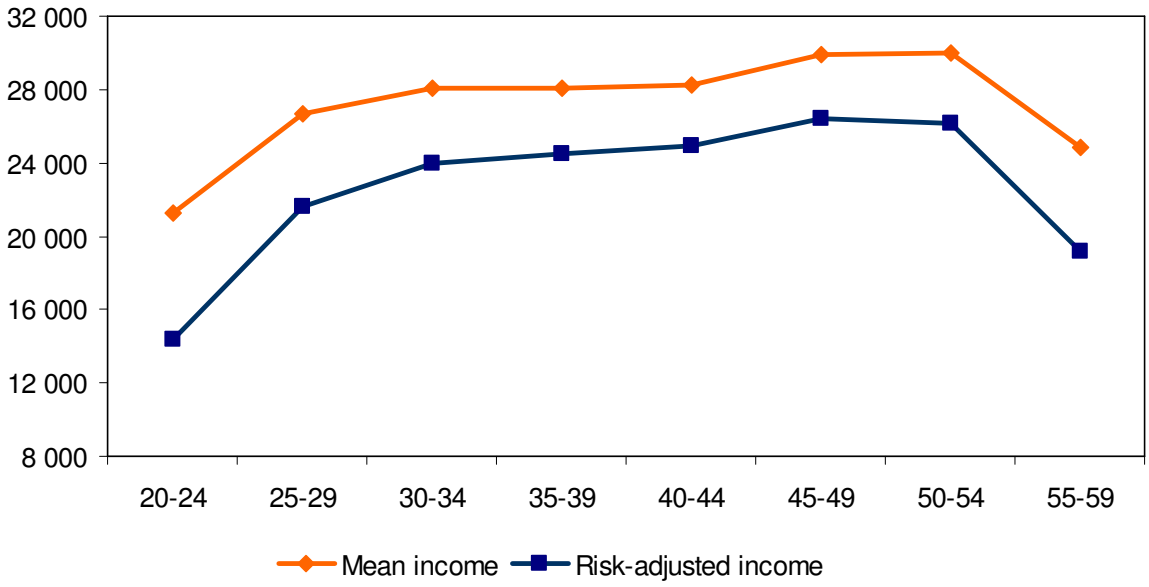


Figure 6. The Gini coefficients of average equivalised household factor income and risk-adjusted income $\rho = 3,$ and age in 2000–2004.

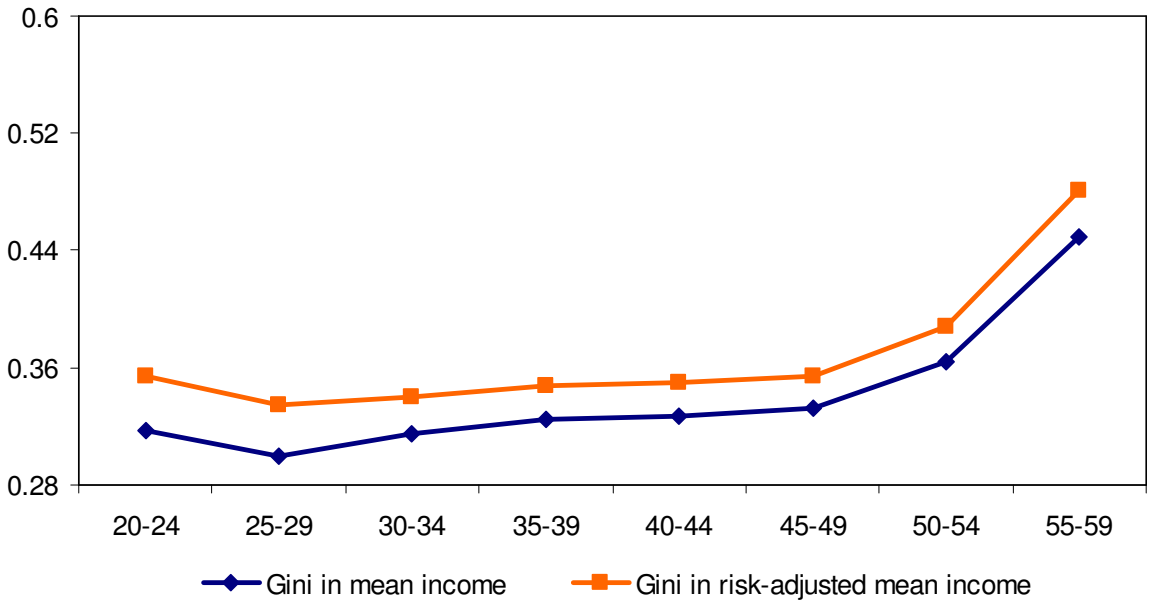


Figure 7. Average (five year) risk-adjusted $\rho = 3$, equivalised household factor income and age in 1995–1999, 2000–2004 and 2004–2008.

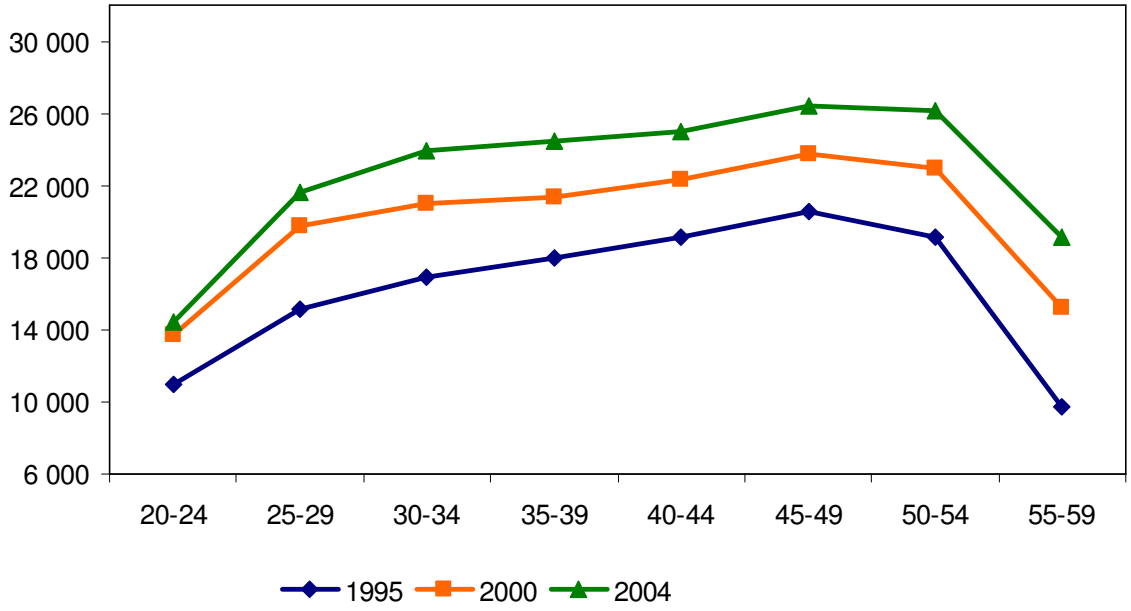


Figure 8. The Gini coefficient of average, risk-adjusted $\rho = 3$, equivalised household factor income and age in 1995–1999, 2000–2004 and 2004–2008.

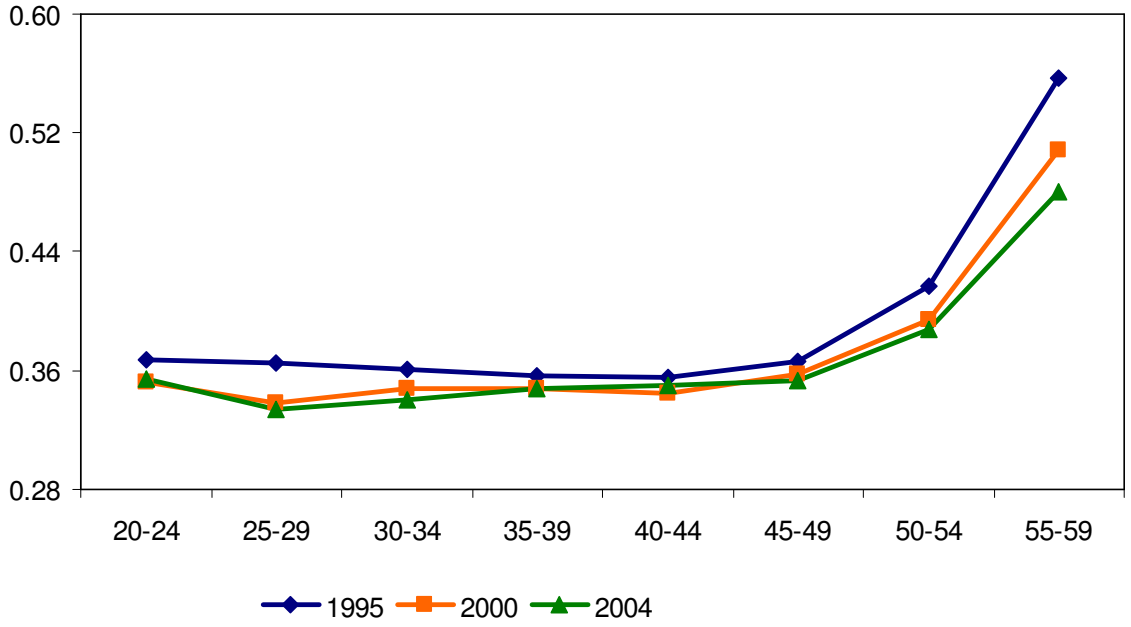


Figure 9. The Gini coefficient of average, risk-adjusted $\rho = 3$, equivalised household disposable income and age in 1995–1999, 2000–2004 and 2004–2008.

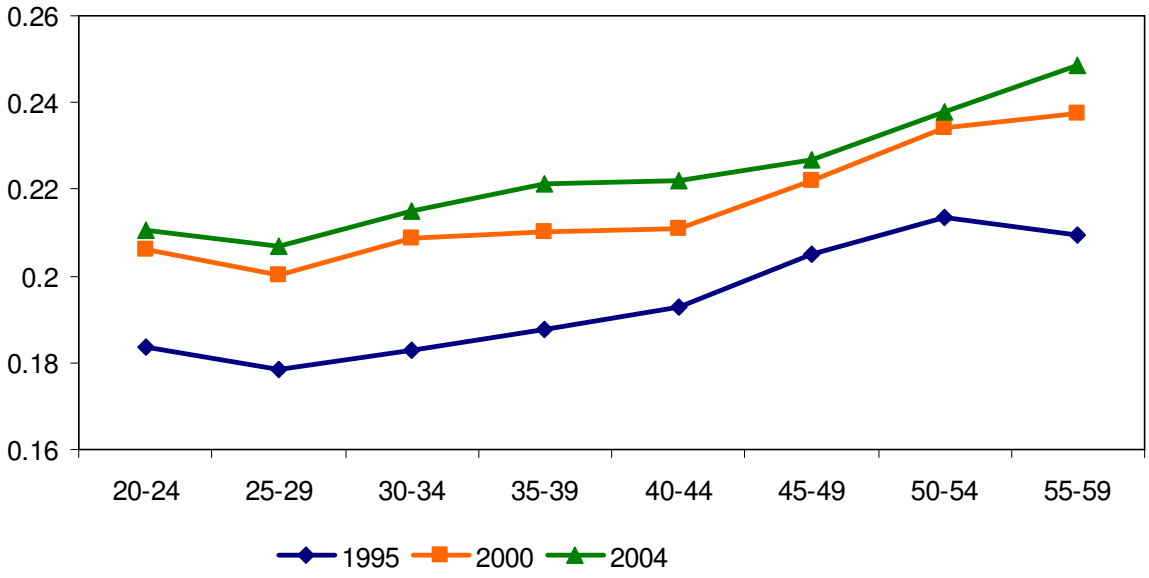


Figure 10. Mean net transfers in average, equivalised household income and age in 1995–1999, 2000–2004 and 2004–2008.

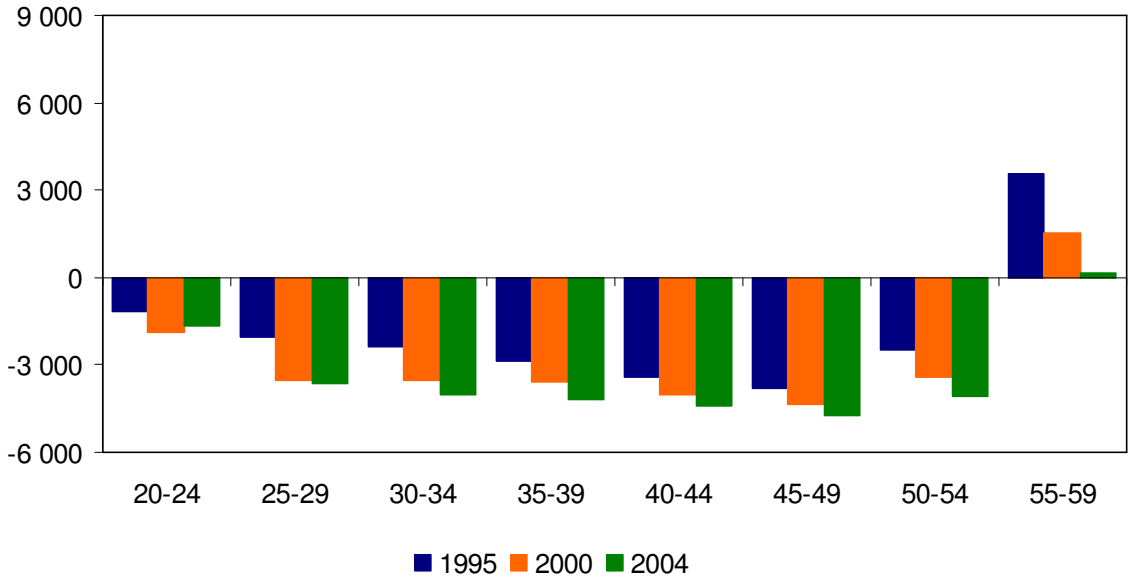


Figure 11. Mean net transfers in average, risk-adjusted $\rho = 3$, equivalised household income and age in 1995–1999, 2000–2004 and 2004–2008.

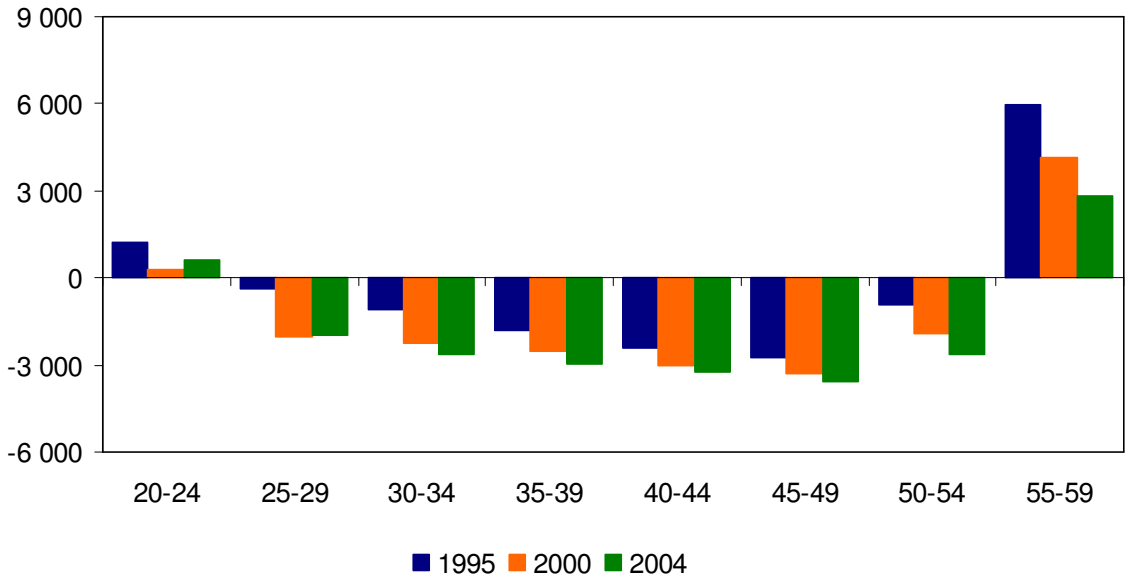


Figure 12. Public sector redistribution of average, equivalised household income and age in 1995–1999, 2000–2004 and 2004–2008.

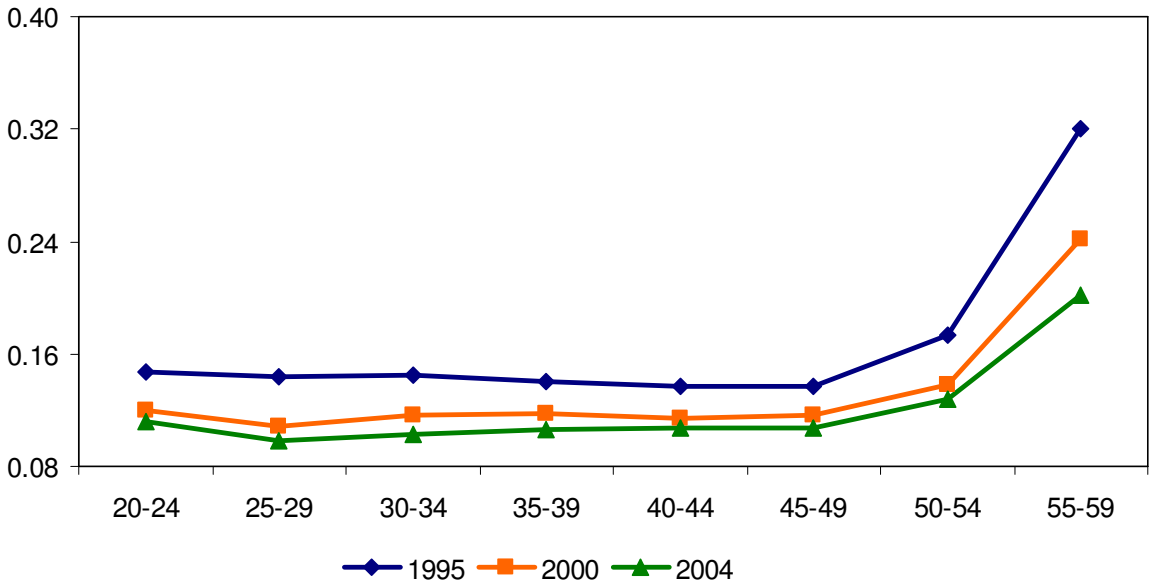
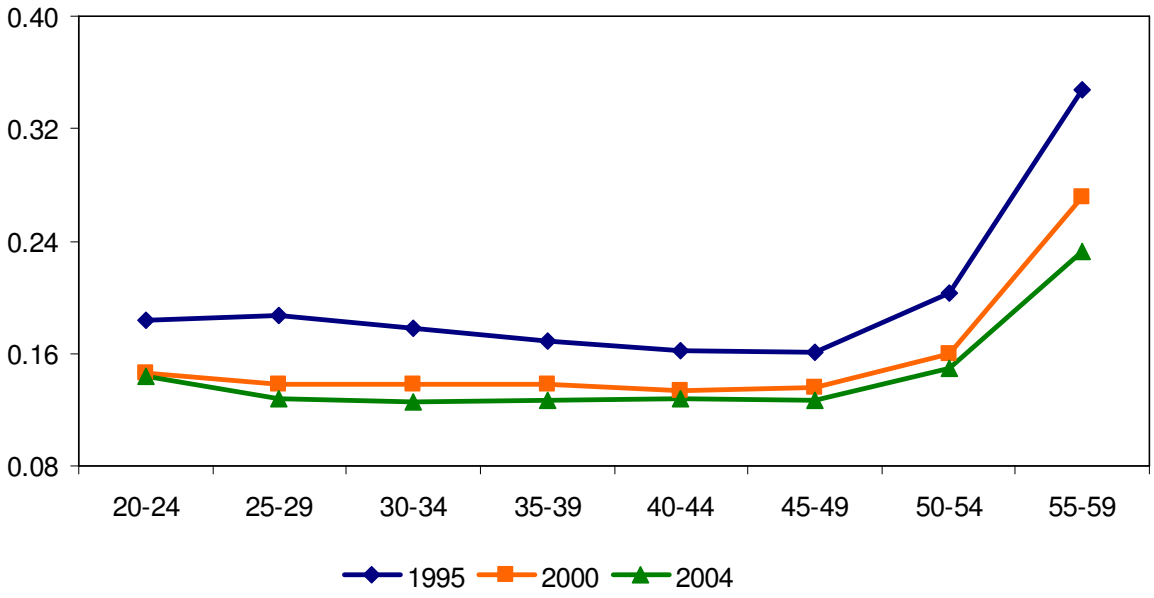


Figure 13. Public sector redistribution of average, risk-adjusted $\rho = 3$, equivalised household income and age in 1995–1999, 2000–2004 and 2004–2008.



APPENDIX

Below the estimators of relative risk premium are reported for real equivalised disposable household income in the 2000–2004 income panel data with $\rho = 3,$ by age and education level (6 levels) and socio-economic status (18 classes). Estimators are based on the means of the individual risk premia in the population stratum in question.

The classifications in Tables A1 & A2 are coded as follows

Socio-economic status	**Code**
farmer	10
self-employed	21
upper white collar employees	
- management	31
- research and planning	32
- education and teaching	33
- other	34
lower white collar employees	
- supervising	41
- independent work	42
- non-independent work	43
- other	44
blue collar workers	
- agricultural	51
- industrial	52
- other production	53
- service and logistics	54
students	60
pensioners	70
long-term unemployed	81
others not elsewhere classified or status unknown	99

Education level	**Code**
primary & lower secondary or unknown	2
upper & post secondary	3
Lowest level tertiary	5
Bachelor or equivalent	6
Masters or equivalent	7
Doctorate or equivalent	8

Table 4. Average risk-adjusted household disposable income in the five-year income panel data, in 1995–1999, 2000–2004 and 2004–2008.

		Age							
Panel	ρ	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
1995–1999	0	16076	17527	17917	17879	18216	19424	20253	18388
	1	15436	17103	17595	17595	17922	19078	19912	18107
	2	14838	16710	17302	17338	17655	18772	19614	17867
	3	14347	16384	17063	17127	17435	18524	19374	17672
	4	13956	16112	16861	16948	17247	18314	19170	17507
	5	13645	15884	16688	16796	17086	18135	18996	17366
2000–2004	0	18123	20595	20841	20572	20842	22108	23085	22277
	1	17322	20055	20430	20216	20487	21726	22677	21918
	2	16583	19557	20062	19901	20172	21388	22325	21612
	3	15991	19146	19762	19644	19912	21110	22041	21366
	4	15525	18806	19508	19426	19692	20874	21802	21160
	5	15159	18522	19292	19240	19505	20670	21598	20983
2004–2008	0	19453	22758	23679	23484	23423	24691	25585	24971
	1	18512	22117	23198	23051	23006	24236	25132	24546
	2	17659	21530	22768	22672	22643	23846	24750	24194
	3	16987	21058	22417	22370	22349	23535	24447	23912
	4	16466	20672	22123	22118	22102	23272	24193	23675
	5	16059	20353	21873	21905	21892	23047	23977	23474

Table 5. Average risk-adjusted household factor income in the five-year income panel data, in 1995–1999, 2000–2004 and 2004–2008.

		Age							
Panel	ρ	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
1995–1999	0	17328	19763	20504	21012	21955	23607	22999	14467
	1	14073	17483	18775	19548	20549	22051	20886	11559
	2	11939	15928	17591	18564	19631	21063	19711	10253
	3	10961	15105	16922	18008	19112	20512	19128	9750
	4	10370	14546	16446	17607	18735	20111	18723	9444
	5	9970	14136	16080	17298	18440	19797	18414	9229
2000–2004	0	20197	24484	24690	24516	25266	26888	26857	20598
	1	16970	22253	22900	22957	23797	25301	24755	17374
	2	14825	20700	21697	21935	22850	24309	23557	15864
	3	13745	19792	20981	21340	22295	23739	22924	15217
	4	13064	19143	20450	20902	21886	23315	22473	14803
	5	12591	18653	20035	20558	21564	22979	22125	14505
2004–2008	0	21297	26715	28065	28057	28229	29881	30031	24827
	1	17802	24286	26093	26305	26578	28126	27997	21458
	2	15547	22631	24774	25178	25562	27068	26823	19862
	3	14412	21657	23967	24501	24961	26442	26163	19131
	4	13692	20961	23360	23996	24512	25970	25682	18648
	5	13192	20432	22882	23598	24156	25593	25306	18294

Table 6. Redistribution (Gini difference) of risk-adjusted household income in the five-year income panel data, in 1995–1999, 2000–2004 and 2004–2008.

		Age							
Panel	ρ	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
1995–1999	0	0.1477	0.1442	0.1447	0.1407	0.1370	0.1369	0.1732	0.3199
	1	0.1637	0.1655	0.1618	0.1558	0.1509	0.1504	0.1904	0.3374
	2	0.1791	0.1820	0.1737	0.1657	0.1595	0.1584	0.1998	0.3451
	3	0.1840	0.1872	0.1777	0.1691	0.1625	0.1612	0.2028	0.3471
	4	0.1859	0.1895	0.1794	0.1707	0.1640	0.1626	0.2043	0.3478
	5	0.1868	0.1906	0.1804	0.1717	0.1649	0.1634	0.2052	0.3481
2000–2004	0	0.1193	0.1086	0.1163	0.1175	0.1140	0.1165	0.1377	0.2413
	1	0.1314	0.1240	0.1287	0.1288	0.1249	0.1276	0.1507	0.2598
	2	0.1422	0.1345	0.1364	0.1357	0.1312	0.1336	0.1577	0.2685
	3	0.1457	0.1378	0.1386	0.1379	0.1332	0.1355	0.1599	0.2712
	4	0.1471	0.1393	0.1396	0.1389	0.1342	0.1364	0.1610	0.2723
	5	0.1477	0.1400	0.1400	0.1395	0.1349	0.1369	0.1616	0.2729
2004–2008	0	0.1120	0.0983	0.1028	0.1062	0.1071	0.1079	0.1281	0.2024
	1	0.1273	0.1140	0.1162	0.1183	0.1192	0.1194	0.1412	0.2213
	2	0.1402	0.1242	0.1235	0.1249	0.1256	0.1252	0.1476	0.2300
	3	0.1440	0.1274	0.1255	0.1269	0.1276	0.1269	0.1496	0.2325
	4	0.1454	0.1287	0.1264	0.1278	0.1286	0.1278	0.1507	0.2336
	5	0.1460	0.1293	0.1268	0.1283	0.1292	0.1283	0.1512	0.2342

Table A1. Relative risk premium in factor income in the 2000–2004 panel data with $\rho = 3$, by age, education level (6 levels) and socio-economic status (18 classes) in 2004.

Socio-econ. Status	Education level	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
10	2	0.3538	0.3622	0.2218	0.1977	0.1830	0.1973	0.2079	0.2535
10	3	0.2244	0.2507	0.2262	0.1792	0.1818	0.1686	0.1974	0.2329
10	5	.	0.2165	0.1539	0.1594	0.1866	0.1934	0.1795	0.2498
10	6	0.3917	0.1699	0.1639	0.1193	0.1508	0.1244	0.1335	0.1946
10	7	.	0.1409	0.2342	0.2719	0.1221	0.3198	0.1554	0.2600
10	8	.	.	0.1156	.	0.6286	.	.	.
21	2	0.3967	0.3217	0.3119	0.2481	0.2223	0.2066	0.2035	0.2245
21	3	0.3319	0.2580	0.2289	0.2126	0.1729	0.1890	0.1869	0.2157
21	5	.	0.1933	0.2080	0.1830	0.1696	0.1419	0.1824	0.1930
21	6	0.2943	0.2849	0.2260	0.1581	0.1994	0.1815	0.1886	0.1800
21	7	.	0.1256	0.2058	0.1799	0.1346	0.1484	0.1267	0.1525
21	8	.	.	0.5584	0.0474	0.0545	0.1242	0.1375	0.0777
31	2	0.6127	0.1120	0.0963	0.1574	0.1445	0.1797	0.1359	0.1566
31	3	0.2918	0.1206	0.1046	0.1239	0.0978	0.0813	0.0834	0.1652
31	5	0.2672	0.0957	0.1188	0.0860	0.0809	0.0650	0.0756	0.1123
31	6	0.0977	0.0903	0.0916	0.0526	0.0461	0.0655	0.0584	0.1294
31	7	0.0723	0.0802	0.0779	0.0657	0.0429	0.0428	0.0702	0.0808
31	8	.	0.2079	0.0588	0.0234	0.0276	0.0438	0.0497	0.0694
32	2	0.3346	0.2217	0.1620	0.1548	0.1301	0.0711	0.0863	0.1808
32	3	0.2394	0.1422	0.0863	0.0861	0.0660	0.0727	0.0495	0.1671
32	5	.	0.1122	0.0725	0.0740	0.0684	0.0562	0.0451	0.1565
32	6	0.1621	0.0858	0.0769	0.0641	0.0577	0.0585	0.0655	0.1021
32	7	0.1890	0.1179	0.0973	0.0765	0.0638	0.0714	0.0492	0.0890
32	8	.	0.1535	0.0836	0.0760	0.0870	0.0983	0.0382	0.0744
33	2	0.2546	0.2935	0.2111	0.1873	0.1389	0.0801	0.1932	0.2650
33	3	0.3223	0.1976	0.1671	0.1493	0.1010	0.0894	0.1222	0.1997
33	5	.	0.1438	0.1224	0.1076	0.0765	0.0832	0.0780	0.1438
33	6	0.2664	0.1526	0.1180	0.0810	0.0725	0.0668	0.0758	0.2747
33	7	0.1219	0.1087	0.0921	0.0708	0.0509	0.0578	0.0749	0.1367
33	8	0.0836	0.1388	0.0887	0.0711	0.0779	0.0547	0.0689	0.1374
34	2	0.3056	0.1732	0.2102	0.1404	0.1224	0.0826	0.0930	0.1795
34	3	0.3123	0.1891	0.1135	0.0964	0.1144	0.0676	0.0858	0.1700
34	5	.	0.1094	0.1255	0.0769	0.0567	0.0727	0.0790	0.2100
34	6	0.2596	0.1257	0.1170	0.0762	0.0488	0.0515	0.0813	0.1532
34	7	0.0945	0.1203	0.1018	0.0808	0.0688	0.0596	0.0603	0.0977
34	8	.	0.1110	0.1094	0.1525	0.0837	0.0866	0.0331	0.0596
41	2	0.3140	0.1244	0.1646	0.1052	0.1148	0.0827	0.0799	0.2351
41	3	0.2363	0.1351	0.0949	0.0771	0.0698	0.0914	0.0807	0.1905
41	5	0.0630	0.1229	0.0771	0.0591	0.0620	0.0621	0.0538	0.1462
41	6	0.1414	0.0787	0.0582	0.0487	0.0431	0.0599	0.0556	0.0852
41	7	0.0599	0.0838	0.0697	0.0603	0.0410	0.0453	0.0484	0.1614
41	8	.	0.2039	0.0757	0.0315	0.0151	0.0282	0.0052	0.0011
42	2	0.2878	0.1966	0.1479	0.1501	0.0929	0.0955	0.1006	0.2067
42	3	0.2373	0.1563	0.1228	0.1021	0.0880	0.0879	0.0886	0.2044
42	5	0.5983	0.1259	0.0998	0.0784	0.0700	0.0695	0.0822	0.1411
42	6	0.1364	0.1099	0.0991	0.0771	0.0644	0.0511	0.0798	0.1080
42	7	0.2539	0.1310	0.0972	0.0884	0.0797	0.0796	0.0524	0.1214
42	8	.	.	0.0972	0.0751	0.0442	0.1026	0.0389	0.0605
43	2	0.3105	0.2553	0.1897	0.1520	0.1292	0.0982	0.1100	0.2301
43	3	0.2887	0.2298	0.1805	0.1254	0.0988	0.1072	0.1093	0.2201
43	5	0.1661	0.1274	0.1155	0.0996	0.0763	0.0980	0.1042	0.2031
43	6	0.1436	0.1640	0.1212	0.0997	0.0542	0.0731	0.0318	0.0481
43	7	0.1017	0.1539	0.1609	0.0744	0.1327	0.0945	0.5810	0.1725
43	8	.	.	0.2454	0.0590	.	0.0839	.	.
44	2	0.3565	0.2410	0.2039	0.1798	0.1460	0.1088	0.1307	0.2357
44	3	0.2261	0.1506	0.1278	0.0986	0.0815	0.0862	0.0936	0.2249

44	5	0.2521	0.1202	0.1026	0.0788	0.0591	0.0685	0.0825	0.2087
44	6	0.1368	0.1075	0.1110	0.0904	0.0789	0.0679	0.0996	0.1344
44	7	0.2320	0.1969	0.1556	0.0686	0.0610	0.1212	0.0893	0.1064
44	8	.	.	0.7715	0.1941	0.2412	0.0461	0.0881	.
51	2	0.2422	0.2328	0.1683	0.1558	0.1181	0.1129	0.1475	0.2544
51	3	0.1914	0.1426	0.1300	0.1386	0.1187	0.1085	0.1329	0.2310
51	5	.	0.0894	0.1935	0.1187	0.1249	0.1412	0.2307	0.1175
51	6	0.1276	0.1381	0.2102	0.1067	0.0272	0.3501	0.0380	0.6226
51	7	.	0.3742	0.1837	0.1546	.	0.4373	0.2012	.
51	8	.	.	.	.	.	0.0246	.	.
52	2	0.2287	0.1699	0.1388	0.1259	0.1145	0.0850	0.1164	0.2546
52	3	0.1682	0.1190	0.1020	0.0848	0.0869	0.0824	0.0993	0.2109
52	5	0.0228	0.1295	0.0857	0.0816	0.0803	0.0878	0.1096	0.1847
52	6	0.2325	0.1212	0.1089	0.0651	0.1429	0.0888	0.2017	0.1432
52	7	0.3355	0.1442	0.1588	0.1431	0.0957	0.1511	0.1858	0.5113
52	8	.	.	0.5900	0.1662	.	.	0.0284	.
53	2	0.2620	0.2111	0.2016	0.1412	0.1374	0.1094	0.1150	0.2229
53	3	0.2230	0.1554	0.1137	0.1012	0.0908	0.0947	0.1119	0.2216
53	5	0.1187	0.1141	0.0936	0.1045	0.0867	0.1097	0.1221	0.1480
53	6	0.1967	0.1545	0.0821	0.1038	0.0707	0.0142	0.0473	0.1869
53	7	0.2785	0.0984	0.2027	0.1982	0.0111	0.3431	0.1852	.
53	8	.	.	0.1458	.	.	.	.	.
54	2	0.2787	0.2436	0.1758	0.1522	0.1401	0.1325	0.1240	0.2270
54	3	0.2413	0.1699	0.1386	0.1222	0.1038	0.1089	0.1304	0.2261
54	5	0.2060	0.1378	0.1194	0.1258	0.1195	0.1533	0.1217	0.2052
54	6	0.2074	0.1491	0.1424	0.1210	0.1934	0.2286	0.1386	0.1545
54	7	0.6517	0.1264	0.2743	0.1769	0.1821	0.0953	0.1620	0.4060
54	8	.	.	.	0.2237	.	.	0.0841	0.0111
60	2	0.6146	0.5838	0.5706	0.5250	0.5914	0.5397	0.4909	0.5827
60	3	0.4476	0.4615	0.4741	0.4925	0.4932	0.4187	0.4690	0.4373
60	5	0.6385	0.4198	0.3932	0.3851	0.3907	0.4705	0.3903	0.6418
60	6	0.3303	0.3987	0.3368	0.3654	0.5472	0.3779	0.4144	0.5324
60	7	0.3177	0.3663	0.3267	0.3749	0.3949	0.4338	0.2774	0.5752
60	8	.	0.4465	0.4627	0.3291	0.4700	0.5681	0.1098	0.3191
70	2	0.4298	0.4344	0.3908	0.3937	0.3787	0.3939	0.3864	0.4252
70	3	0.5283	0.4297	0.4439	0.4473	0.3894	0.3900	0.3975	0.4265
70	5	.	0.4428	0.4853	0.4680	0.4542	0.3828	0.3905	0.4156
70	6	0.4665	0.5893	0.6488	0.4353	0.5102	0.5143	0.4761	0.3858
70	7	.	0.5065	0.5091	0.5475	0.4173	0.4589	0.3292	0.4116
70	8	.	.	.	.	0.3070	0.8472	0.2642	0.4202
81	2	0.6239	0.5786	0.5576	0.5519	0.5306	0.4795	0.4560	0.5259
81	3	0.4806	0.4606	0.4520	0.4402	0.4602	0.4432	0.4316	0.4950
81	5	0.4594	0.3488	0.3367	0.4049	0.3996	0.4383	0.4523	0.4710
81	6	0.3770	0.3922	0.3819	0.3751	0.4627	0.4001	0.4142	0.4255
81	7	0.3485	0.3710	0.4325	0.3646	0.4837	0.4325	0.4687	0.5694
81	8	.	0.1139	0.5212	0.3020	0.4984	0.3751	0.1194	0.2380
99	2	0.5441	0.6101	0.5755	0.5604	0.5077	0.4365	0.4510	0.4639
99	3	0.4180	0.4413	0.4757	0.4953	0.4335	0.4468	0.4377	0.4580
99	5	0.5367	0.4704	0.4777	0.4130	0.4763	0.4201	0.3413	0.3461
99	6	0.3228	0.3129	0.3076	0.4561	0.3610	0.3516	0.3942	0.5058
99	7	0.5034	0.3828	0.3740	0.3807	0.3460	0.5188	0.5696	0.4226
99	8	.	.	.	0.5371	0.6571	0.1431	0.3715	0.9111

Table A2. Relative risk premium in disposable in the 2000–2004 panel data with $\rho = 3$, by age, education level (6 levels) and socio-economic status (18 classes) in 2004.

Socio-econ. Status	Education level	Age 2004 20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59
10	2	0.1588	0.1968	0.1274	0.1062	0.0883	0.1165	0.1253	0.1406
10	3	0.1224	0.1363	0.1140	0.0936	0.1079	0.1097	0.1211	0.1225
10	5	.	0.1062	0.0890	0.0936	0.1203	0.1211	0.1290	0.1198
10	6	0.2574	0.0927	0.0648	0.0975	0.1154	0.0975	0.1031	0.1070
10	7	.	0.0549	0.2027	0.1248	0.0952	0.2321	0.0951	0.1302
10	8	.	.	0.0255	.	0.1727	.	.	.
21	2	0.1993	0.1644	0.1910	0.1320	0.1186	0.1314	0.1214	0.1084
21	3	0.1918	0.1452	0.1085	0.1192	0.0981	0.1125	0.1098	0.1031
21	5	.	0.1073	0.1092	0.1024	0.0984	0.0926	0.1233	0.1032
21	6	0.1672	0.1614	0.1240	0.0758	0.1191	0.1111	0.1304	0.1050
21	7	.	0.0760	0.1119	0.1012	0.0705	0.1075	0.0793	0.1000
21	8	.	.	0.2595	0.0117	0.0602	0.0769	0.0616	0.0707
31	2	0.3985	0.0713	0.0510	0.0957	0.0754	0.0911	0.0651	0.0389
31	3	0.1674	0.0758	0.0496	0.0535	0.0504	0.0404	0.0355	0.0468
31	5	0.2055	0.0720	0.0548	0.0544	0.0475	0.0380	0.0411	0.0277
31	6	0.0743	0.0451	0.0398	0.0276	0.0309	0.0393	0.0335	0.0245
31	7	0.0542	0.0529	0.0412	0.0411	0.0297	0.0280	0.0342	0.0235
31	8	.	0.1278	0.0399	0.0136	0.0227	0.0406	0.0333	0.0277
32	2	0.1482	0.1239	0.0792	0.0961	0.0619	0.0411	0.0299	0.0296
32	3	0.1107	0.0690	0.0433	0.0444	0.0271	0.0429	0.0327	0.0399
32	5	.	0.0440	0.0365	0.0333	0.0348	0.0276	0.0242	0.0325
32	6	0.0807	0.0437	0.0352	0.0326	0.0294	0.0307	0.0306	0.0237
32	7	0.1123	0.0685	0.0502	0.0416	0.0376	0.0393	0.0279	0.0256
32	8	.	0.0579	0.0422	0.0400	0.0442	0.0629	0.0253	0.0328
33	2	0.0968	0.0743	0.0655	0.0543	0.0927	0.0496	0.1035	0.0382
33	3	0.1509	0.0916	0.0647	0.0572	0.0360	0.0388	0.0476	0.0458
33	5	.	0.0567	0.0458	0.0434	0.0443	0.0433	0.0405	0.0345
33	6	0.1094	0.0631	0.0525	0.0349	0.0362	0.0388	0.0315	0.0323
33	7	0.0625	0.0563	0.0426	0.0343	0.0295	0.0332	0.0356	0.0315
33	8	0.0129	0.1051	0.0421	0.0362	0.0521	0.0380	0.0376	0.0443
34	2	0.1623	0.0891	0.0893	0.0601	0.0885	0.0569	0.0276	0.0357
34	3	0.1635	0.0928	0.0581	0.0517	0.0525	0.0306	0.0337	0.0309
34	5	.	0.0499	0.0579	0.0410	0.0312	0.0425	0.0410	0.0345
34	6	0.1157	0.0640	0.0590	0.0322	0.0251	0.0299	0.0352	0.0327
34	7	0.0566	0.0647	0.0493	0.0420	0.0395	0.0347	0.0331	0.0261
34	8	.	0.0829	0.0585	0.0701	0.0388	0.0506	0.0289	0.0295
41	2	0.1269	0.0490	0.0789	0.0303	0.0489	0.0387	0.0251	0.0321
41	3	0.1140	0.0614	0.0361	0.0318	0.0350	0.0370	0.0348	0.0283
41	5	0.0334	0.0512	0.0346	0.0262	0.0314	0.0302	0.0257	0.0262
41	6	0.0667	0.0379	0.0288	0.0221	0.0235	0.0395	0.0291	0.0211
41	7	0.0378	0.0509	0.0331	0.0309	0.0259	0.0289	0.0393	0.0492
41	8	.	0.1407	0.0315	0.0169	0.0126	0.0360	0.0049	0.0010
42	2	0.1071	0.0630	0.0496	0.0459	0.0400	0.0453	0.0349	0.0336
42	3	0.1089	0.0715	0.0447	0.0378	0.0386	0.0393	0.0353	0.0344
42	5	0.0827	0.0493	0.0450	0.0365	0.0371	0.0359	0.0343	0.0302
42	6	0.0770	0.0532	0.0430	0.0321	0.0295	0.0297	0.0426	0.0340
42	7	0.1742	0.0669	0.0460	0.0508	0.0441	0.0411	0.0376	0.0440
42	8	.	.	0.0920	0.0153	0.0204	0.0543	0.0381	0.0519
43	2	0.1101	0.0649	0.0348	0.0460	0.0509	0.0420	0.0394	0.0469
43	3	0.1340	0.0985	0.0711	0.0390	0.0418	0.0415	0.0431	0.0411
43	5	0.1480	0.0565	0.0335	0.0317	0.0357	0.0456	0.0346	0.0427
43	6	0.0851	0.0787	0.0482	0.0441	0.0219	0.0411	0.0311	0.0281

43	7	0.0707	0.0964	0.0611	0.0298	0.0406	0.0314	0.0140	0.0797
43	8	.	.	0.1695	0.0253	.	0.0735	.	.
44	2	0.1313	0.0669	0.0519	0.0406	0.0430	0.0342	0.0296	0.0309
44	3	0.0979	0.0548	0.0394	0.0383	0.0350	0.0360	0.0302	0.0300
44	5	0.0927	0.0461	0.0388	0.0365	0.0338	0.0392	0.0355	0.0382
44	6	0.0617	0.0492	0.0438	0.0414	0.0390	0.0379	0.0408	0.0430
44	7	0.1281	0.0884	0.0704	0.0342	0.0223	0.0458	0.0673	0.0276
44	8	.	.	0.5590	0.1680	0.1624	0.0204	0.0244	.
51	2	0.1038	0.0713	0.0454	0.0516	0.0431	0.0534	0.0366	0.0315
51	3	0.0931	0.0598	0.0429	0.0446	0.0410	0.0403	0.0508	0.0538
51	5	.	0.0433	0.0524	0.0505	0.0774	0.0358	0.1137	0.0793
51	6	0.0779	0.0794	0.1597	0.0386	0.0154	0.0373	0.0236	0.0622
51	7	.	0.2537	0.1269	0.1405	.	0.0681	0.1779	.
51	8	.	.	.	.	.	0.0036	.	.
52	2	0.0835	0.0624	0.0400	0.0413	0.0374	0.0284	0.0267	0.0305
52	3	0.0731	0.0420	0.0326	0.0274	0.0279	0.0318	0.0262	0.0279
52	5	0.0155	0.0427	0.0313	0.0280	0.0351	0.0339	0.0315	0.0279
52	6	0.0870	0.0530	0.0321	0.0283	0.0317	0.0527	0.0859	0.0249
52	7	0.2166	0.0701	0.0378	0.0523	0.0324	0.0414	0.1016	0.0383
52	8	.	.	0.0251	0.0684	.	.	0.0243	.
53	2	0.0869	0.0574	0.0585	0.0440	0.0383	0.0317	0.0314	0.0342
53	3	0.0933	0.0545	0.0325	0.0305	0.0320	0.0306	0.0292	0.0273
53	5	0.0217	0.0403	0.0331	0.0332	0.0327	0.0465	0.0443	0.0256
53	6	0.1174	0.0589	0.0295	0.0286	0.0425	0.0116	0.0285	0.0398
53	7	0.0987	0.0745	0.1465	0.0423	0.0080	0.2606	0.1216	.
53	8	.	.	0.0874	.	.	.	.	.
54	2	0.0902	0.0817	0.0429	0.0465	0.0444	0.0373	0.0285	0.0301
54	3	0.1011	0.0617	0.0418	0.0357	0.0365	0.0337	0.0323	0.0319
54	5	0.0833	0.0569	0.0482	0.0459	0.0433	0.0557	0.0328	0.0347
54	6	0.0904	0.0654	0.0705	0.0458	0.0451	0.0960	0.0490	0.0283
54	7	0.3320	0.0760	0.0989	0.0450	0.0640	0.0349	0.0795	0.0644
54	8	.	.	.	0.0145	.	.	0.0626	0.0202
60	2	0.1643	0.1372	0.0905	0.0896	0.0647	0.0744	0.0736	0.0800
60	3	0.1748	0.1692	0.1175	0.0971	0.0858	0.0716	0.0848	0.0755
60	5	0.1086	0.1404	0.1243	0.0778	0.0716	0.0869	0.0702	0.0732
60	6	0.1484	0.1473	0.1294	0.1106	0.1343	0.0999	0.0955	0.1514
60	7	0.1440	0.1958	0.1351	0.1598	0.1020	0.1427	0.1167	0.0678
60	8	.	0.1831	0.3222	0.2733	0.2470	0.2729	0.0941	0.0295
70	2	0.0623	0.0565	0.0422	0.0358	0.0375	0.0338	0.0316	0.0333
70	3	0.1006	0.0638	0.0409	0.0454	0.0347	0.0389	0.0358	0.0334
70	5	.	0.0561	0.0570	0.0626	0.0500	0.0470	0.0401	0.0310
70	6	0.0822	0.1281	0.0991	0.0366	0.0555	0.0477	0.0421	0.0335
70	7	.	0.0654	0.0418	0.1421	0.0909	0.0815	0.0502	0.0315
70	8	.	.	.	.	0.0146	0.0592	0.2193	0.1081
81	2	0.1192	0.0834	0.0685	0.0646	0.0649	0.0625	0.0553	0.0422
81	3	0.1191	0.0813	0.0711	0.0612	0.0603	0.0606	0.0606	0.0422
81	5	0.1111	0.0641	0.0655	0.0640	0.0610	0.0606	0.0623	0.0575
81	6	0.1360	0.1027	0.0736	0.0598	0.0773	0.0767	0.0847	0.0694
81	7	0.1066	0.1382	0.1199	0.1017	0.0858	0.0954	0.0839	0.0789
81	8	.	0.0785	0.1893	0.0529	0.1643	0.0487	0.0522	0.0310
99	2	0.1594	0.1546	0.1466	0.1392	0.1441	0.1595	0.1330	0.1435
99	3	0.1665	0.1416	0.1178	0.1308	0.1216	0.1370	0.1253	0.1206
99	5	0.1298	0.1179	0.1376	0.1006	0.1796	0.1835	0.1837	0.1840
99	6	0.1626	0.1119	0.1004	0.1517	0.1103	0.2014	0.1716	0.3463
99	7	0.3737	0.1434	0.1891	0.1926	0.1239	0.2677	0.3077	0.2079
99	8	.	.	.	0.4602	0.6503	0.0048	0.3560	0.1939