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RECENT TRENDS IN INCOME INEQUALITY IN FINLAND

Abstract

In this study income inequality in Finland was investigated using a decomposition analysis by income group and income source. We have offered some explanations for the recent trends or episodes in income inequality, focusing on changes in employment status, different sources of incomes and the redistributive role of the government budget. Several conclusions can be drawn from the results. Total inequality rose significantly during the latter part of the 1990s. The clear conclusion of decompositions is that variations within groups were far more important in accounting for total inequality than variations between groups. As a general pattern inequality rose proportionately more within those socio-economic groups with growing capital income shares. In particular among entrepreneurs this share grew most significantly during the 1990s. The results show that capital income although it appears to represent only 17.4 per cent of the total equivalent household income in 1999 makes by far the most significant proportional contribution to overall inequality. The 1993 tax reform, a so-called dual income tax system, is undoubtedly one of key factors responsible for this trend. Rising unemployment in the early 1990s, perhaps surprisingly, did not increase income inequality. More importantly, the number of the unemployed below the poverty line (50 per cent of national average income) has risen from 1994. Since 1991 there was a declining trend in the average real disposable income of unemployed households. This is without due to those policy measures cutting the redistributive impact of transfers, which have led inequality of disposable income to increase more than that of factor income.

Key words: Inequality, unemployment, income decomposition

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1 Introduction

For a long time in the post war period income differences were gradually declining in many industrialised countries. This was just as Kuznets (1955) hypothesised that, following an initial widening of the income distribution, income differences in advanced countries would move towards greater equality. The recent experience from the beginning of the 1980s shows that the process described by Kuznets has gone into sharp reverse in many advanced countries. Nevertheless income inequality did not increase in all countries in the 1980s, among others in Finland. Moreover, according to Atkinson et al. (1995) income inequality in Finland was lowest in OECD countries in the 1980s.

Figure 1 shows what has happened to the Gini coefficient (of different income concepts) in Finland between 1966 and 1999. Three periods can be distinguished in the case of disposable income.¹ The first period, between 1966 and 1976, saw a very remarkable fall in inequality. The inequality remained almost constant until the turning point in the beginning of the 1990s. Since then, from the beginning of the 1990s, there is little doubt that income distribution has become more unequal. In the first five years (1990-1994) considered in Figure 1 inequality rose only modestly, coinciding with a period of rapidly increasing unemployment. During the following period as the Finnish economy recovered, inequality rose very quickly. Average real incomes have grown significantly since 1994, but at the bottom of the scale there has been little or no rise in real income, whereas top incomes have risen a much faster than the average. This rise of income inequality is departure from the pattern of previous decades in Finland. Figure 1 also shows how the indicators of redistribution have varied in Finland over the period since 1966. The Gini coefficient for factor income declined from around 38 per cent in 1966 to 35 per cent in 1976, since then it increased slightly up to the beginning of the 1990s. Then it rose rapidly due to unemployment, but from 1993 the Gini coefficient for factor income has risen much less than the Gini coefficient for disposable income. The Gini coefficient for gross income (including transfers) has very much the same pattern as for disposable income. The redistributive impact of transfers and taxes appears to have fallen since

¹Like most inequality measures, the Gini coefficient measures inequality relative to two limits. It takes a minimum value of zero if income is equally distributed across the population, with all individuals receiving the same income. It takes a maximum value of one in a situation where all income would be given to a single individual in the society.

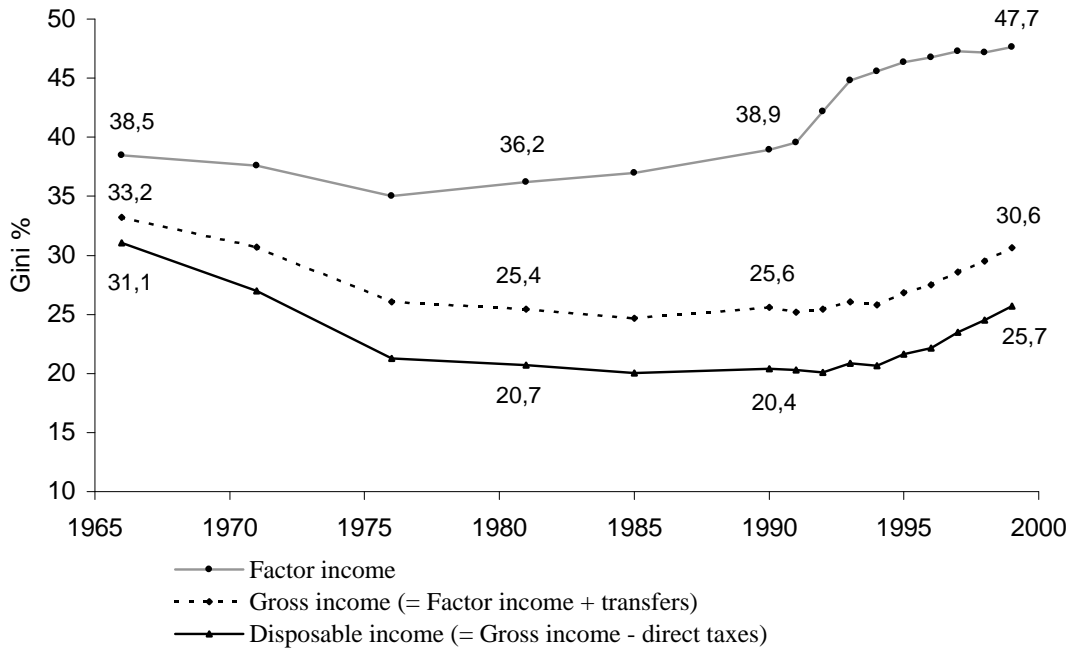


Figure 1: Gini coefficients of incomes in Finland 1966-1999

1994. So we know what happened during the 1990s but the question to be asked is why?²

What can explain this rise in inequality? Why has the previous trend been reversed? There are strong grounds for believing that the rise in income inequality in Finland in the 1990s was associated with a fall in the proportion of households with income from work. Between 1966 and 1999 there was a declining trend in the importance of work. Most importantly between 1990 and 1994 there was a significant reduction in the proportion of household income from work, resulting mostly from unemployment. Although the biggest income component of household income is still earnings (= labour income plus entrepreneurial income), 85.3 per cent of disposable income in 1999, the share of capital income has risen from 6.6 per cent in 1990 to 17.4 per cent in 1999. There has been no single cause of the distributional changes in Finland during the 1990s. It seems to us safe to conclude that the important

²For further discussion of recent evolution in Finnish income distribution, see Uusitalo (1988, 1989, 2000), Suoniemi (1998, 1999), Riihelä, Sullström and Tuomala (2001), Riihelä and Sullström (2001).

part of explanation for the inequality increase must be sought in the divergence of experiences with particular groups, in changes of different source of income, and especially in the redistributive role of the government budget.

In this paper we are concerned in particular with the economic circumstances of people who do not work versus those that do. If we look at the distribution of earnings, we observe great inequality. There is considerable inequality not only amongst those who belong to the labour force, but there is large number of people without any labour income. People without labour income may still have a reasonable standard of living. The reason is not only that we have welfare state programs, but consumption is not only determined by current income, but also by past and future income. The distribution of lifetime income would almost by definition show less inequality than that of annual income. These are important considerations in assessing consequences of the deep recession we experienced in Finland in the 1990s.

It is clear that if we are concerned with inequality, what really matters is not the distribution of income per se, but the distribution of the standard of living between individuals and households. At a more general level we can raise an important question: What is precisely the difference between income inequality and economic inequality? As has been argued most notably by Amartya Sen (1997) the distinction is of considerable importance for economic practice as well as economic theory. "Income is, of course, a crucially important means, but its importance lies in the fact that it helps the person to do things that she values doing and to achieve states of being that she has reasons to desire". There may be substantial differences between the income-based view and non-income indicators of quality of life. In particular inequality comparisons will yield very different results depending on whether we concentrate only on incomes or also on the impact of other economic and social influences on the quality of life. For example, it may be so that an over-concentration on income inequality alone has permitted greater social and political tolerance of unemployment in Finland than in other European countries that cannot be justified if we have a broader view of economic inequality.

Standard of living is not an easy concept to make empirically operational. It clearly depends on the level of consumption of private goods, on the supply of public goods and publicly provided private goods such as education, health care and social services. There is no single, correct way of measuring the standard of living. Therefore, both income and expenditure inequality need to be considered in forming

a comprehensive view of inequality. The majority of empirical studies concentrate on income as the primary measure. In most cases this reflects the availability and reliability of data. Nevertheless, there are a number of important insights that can be gained by looking at expenditure as well. In this paper we focus on income inequality whereas Riihelä and Sullström (2000) focuses on expenditure inequality.

We employ a decomposition analysis of inequality by income source and by population groups to understand and explain particular aspects of economic inequality in Finland. Making use of decomposition allows answers to questions as: How much is contributed to inequality by different population groups? And how much is contributed by different income sources? There are numerous ways of decomposing the population to reveal its constituent parts and their contribution to the overall picture of economic inequality. Because one of our aims is to explain how the shift from work has affected economic inequality it turned out to be very useful to consider two categories, those in work and those not in work.

The structure of the paper is as follows. Section 2 describes the data used in our study. We focus on two groups, those households where either husband or wife is in work and those where neither in work. Section 3 uses decomposition analysis to study the impacts of the shift from work on inequality. It also examines changes in the tax and benefit system and the effects that these have had on inequality. The following section breaks income down into its constituent parts. It considers from where households receive money and how the importance of different sources has altered during the 1990s. Section 5 concludes the paper.

2 The Data

We describe briefly the data used in this study. We use the income distribution statistics (IDS) published by the Statistics Finland. The IDS is a sample survey of around 9000-11000 households drawn from the private households in Finland. The IDS contains information on incomes, taxes and benefits together with various socio-economic characteristics of the Finnish households. Most of the information contained in the IDS has been collected from various administrative registers. Auxiliary information is collected through interviews. The following components of disposable income are used in this study,

Labour income
 + Entrepreneurial income
 = Earned income
 + Capital income
 = Factor income (market income)
 + Current transfers received (taken separately national social security benefits, occupational social security benefits, social benefits, unemployment benefits and other current transfers received)
 = Gross income
 - Direct taxes, social security contributions and other current transfers paid
 = Disposable income
 + Transfers received outside disposable income
 - Transfers paid outside disposable income

Sometimes we call disposable income net income because it is factor income (market income) plus net transfers (difference between received and paid transfers of households). Indirect taxes, such as VAT and specific commodity taxes and the provision of public services are not included on our data. This may have important consequences, because indirect taxes and public services tend to be regressive (see for example Sullström and Riihelä, 1996 and Suoniemi, 1993).

All types of income used in this study are calculated on annual basis. The OECD equivalence scale is used in order to make comparable households with different size and composition. The OECD-scale is calculated as follows. The first adult in each household has a weight of 1 and each additional adult a weight of 0.7. Each child under 18 years old gets a weight of 0.5.

3 Decomposition by income groups; Impact of the shift from employment on the distribution of income in the 1990s

Overall, the most important component of income is earned income, earnings, (labour income plus entrepreneurial income). Table A1 in Appendix shows how the

shares of disposable income have altered. The share of earned income has fallen from 99.7 in 1990 to 85.3 in 1999 and as a per cent of factor income from 93.9 to 88.1. This reflects the trend towards lower levels of employment. The greatest fall occurred between 1990 and 1994, when the share of earned income fell from 99.7 per cent to 80.2 per cent, just as the rate of unemployment reached unprecedented levels. In fact the gradual trend downward had occurred throughout the last three decades. The second biggest source of income throughout the period has been transfers or social security. Its share has risen sharply from 27.1 per cent in 1990 to 41.9 per cent in 1994 and then it has fallen to 33.7 in 1999. According to Household Survey the share of capital income actually declined from the mid 1960s to the mid 1980s, but since then it has gradually risen to form 17.4 per cent of households' disposable income in 1999.

The consequences of the shift in the importance of earned income depend on how it has been shared. Has the fall in earned income spread proportionately across the population, especially during the first part of the 1990s? There is no evidence for this case in Finland in the 1990s. On the contrary the proportion of households where the head was employed or self-employed fell dramatically by 10.4 percentage points between 1990 and 1994 (see Table 1).

Table 1

The ratio of mean incomes (m_1/m_2) and the population share of group 1

Year	Factor income	Gross income	Disposable income	Population share of group 1
1990	5.91	1.51	1.29	78.9
1991	5.00	1.41	1.23	77.5
1992	4.86	1.38	1.21	72.4
1993	4.67	1.36	1.21	68.5
1994	5.01	1.41	1.24	67.0
1995	5.54	1.42	1.24	68.5
1996	5.79	1.44	1.24	68.7
1997	5.65	1.46	1.27	69.5
1998	5.05	1.45	1.26	70.2
1999	5.26	1.52	1.32	70.9

Incomes is adjusted by the OECD equivalence scale

Using the inequality decomposition technique and the data from IDS in 1990-1999

we explore how has this decline in the importance of work affected the distribution of income during the 1990s in Finland. There are, of course, a number of different ways of splitting the population for the purposes of decomposition analysis. In the first stage we have chosen to split it into two groups; those households where household head is in work, denoted by group 1 and those where household head is not in work denoted by group 2 including mainly unemployed and pensioners.³

The basic idea of decomposition is that some forces affect the income inequality by changing the size of different groups, others affect income sources, and some do all of these. We consider in this section decomposition by population subgroup. Total inequality depends on inequality within each of the subgroups, the size of subgroup relative to the total population and the average income of each subgroup. For additively decomposable inequality measures, total inequality is equal to the weighted sum the inequalities within each subgroup (within-group inequality), plus between group inequality which is equal to the total inequality there would be if each person would receive the mean income of the subgroup to which he or she belongs. More formally we can write any additively decomposable inequality measure $I = I_W + I_B$, where I_W is inequality within group and I_B is between-group inequality.

How to interpret the empirical evidence? The shift from work produces simultaneous shifts in both population shares and relative incomes (see Table 1). The effect of this shift from group 1 to group 2 also depends on the distribution within the two groups. Is income inequality greater among group 1 than among group 2?

All six measures used, the generalised entropy measures (including Theil's measures, the mean log deviation ($c = 0$) and the Theil index ($c = 1$) and the squared coefficient of variation ($c = 2$) (Shorrocks, 1980), the variance of logarithms⁴, the Atkinson index ($e = 0.5, 1$ and 2) and the Gini coefficient⁵, reflect higher inequality among those not in work, i.e group 2⁶. On the basis of IDS data, the inequality in both groups continued to increase throughout the 1990s. Furthermore, the Lorenz curves for groups 1 and 2 do not cross during the 1990s.

³See Kanbur (1982) on the pioneering work in using the analytical framework of inequality decomposition.

⁴The variance of logarithms does not belong to the generalised entropy class. The variance of logarithms uses the geometric mean an alternative representative income that places more weight on low incomes (see Anand, 1983).

⁵See Cowell (1995) for a good exposition of these measures.

⁶ e is the relative inequality aversion parameter.

In order to make meaningful comparisons between estimates of inequality measures we need to examine the statistical significance of the results. We employ technique developed by Cowell (1989). Table 2 attaches standard errors to the calculated inequality measures.

The rise in the proportion of households without earned income is important because this group not only has a lower average income but also exhibits much greater inequality than group 1. It may be some surprise that inequality is greater among the household without earned income. Because earned income makes up the largest single source of household income we might reasonable expect the most important trends in inequality are driven by changes in the distribution of earned income. This does not seem to be the case in Finland in the 1990s. This also makes it of particular interest to examine more closely income distribution in both groups.

The clear conclusion of the decomposition analysis was that variation within groups was far more important in accounting on total inequality than variation between groups. In the two-group case, between-groups component contributed less than 2 per cent to total inequality in 1999. When the population is grouped into eight socio-economic groups according to the squared coefficient of variation, disparities between groups account for 15.5 per cent of total inequality in 1990, 12.1 per cent in 1993 and 5.9 per cent in 1999.

The inequality in both groups continued to increase during the latter part of the 1990s. Interestingly, the divergence in inequality between two groups remained almost the same until 1997. Since then the growth of inequality has been more rapid among those not in work than in group 1. An important part of the explanation for the overall increase in inequality must be sought in the divergence of experiences within different groups. There are divergences in the average income of different groups (see Figure 2) and the relative sizes of groups changed over the 1990s (see Table A2 in Appendix). So it is not just the increased numbers of unemployed and the increased gap between the incomes of group 1 and group 2 which is responsible for increased inequality, but also the gap between well-paid people in group 1 and poorly paid people in group 1; between richer pensioners and poorer pensioners in group 2.

It is also apparent that the differences between the mean income of various subgroups within those not in work and those in work have diverged during the latter part of the 1990s. Therefore, we also perform further decompositions in both

Table 2
Income Inequality in Finland 1990, 1993 and 1999

Inequality measure	Group	Year 1990			Year 1993			Year 1999		
		FI	GI	DI	FI	GI	DI	FI	GI	DI
Generalised Entropy class of measures ($c = 0$)	1	14.0 (0.29)	9.3 (0.20)	6.2 (0.13)	17.1 (0.45)	10.1 (0.30)	6.9 (0.24)	20.0 (1.00)	13.8 (0.86)	10.6 (0.75)
	2	56.7 (2.24)	10.6 (0.43)	7.1 (0.31)	55.1 (2.66)	11.3 (0.58)	7.7 (0.47)	82.9 (6.93)	15.9 (1.55)	11.7 (1.28)
	Total	37.3 (0.71)	10.9 (0.19)	7.0 (0.12)	44.0 (0.99)	11.4 (0.28)	7.5 (0.22)	52.6 (1.62)	16.1 (0.77)	11.6 (0.66)
$(c = 1)$	1	13.5 (0.32)	9.8 (0.27)	6.4 (0.15)	16.8 (0.70)	10.8 (0.55)	7.5 (0.45)	23.8 (2.44)	18.2 (2.13)	14.3 (1.95)
	2	45.3 (2.14)	11.4 (0.54)	7.5 (0.37)	45.7 (3.38)	12.4 (0.94)	8.3 (0.77)	93.6 (16.2)	21.5 (3.73)	15.8 (3.02)
	Total	24.7 (0.42)	11.2 (0.25)	7.1 (0.14)	31.2 (0.77)	12.2 (0.48)	8.1 (0.39)	40.5 (2.51)	20.5 (1.87)	15.4 (1.66)
$(c = 2)$	1	16.1 (0.72)	12.1 (0.62)	7.2 (0.24)	22.9 (3.46)	15.3 (2.49)	10.4 (1.77)	62.2 (22.0)	48.6 (17.3)	39.3 (16.0)
	2	72.7 (8.09)	14.3 (0.96)	8.9 (0.64)	83.4 (15.5)	17.4 (2.53)	11.2 (1.89)	573.2 (206.3)	57.8 (21.0)	40.1 (15.0)
	Total	26.2 (0.86)	13.7 (0.58)	8.0 (0.23)	38.5 (4.08)	16.9 (2.10)	11.0 (1.43)	92.9 (25.8)	53.0 (15.5)	40.7 (13.4)
Variance of logarithms	1	29.9 (0.76)	18.0 (0.38)	12.5 (0.31)	36.7 (1.08)	19.5 (0.71)	13.3 (0.65)	37.2 (1.26)	22.7 (0.71)	17.1 (0.49)
	2	174.2 (8.87)	20.1 (0.77)	14.1 (0.67)	164.3 (11.2)	21.1 (0.87)	14.7 (0.73)	221.8 (11.8)	26.1 (1.35)	19.3 (1.12)
	Total	125.5 (3.91)	21.4 (0.38)	14.0 (0.28)	138.6 (4.66)	22.2 (0.59)	14.6 (0.43)	172.0 (8.42)	27.7 (0.69)	19.4 (0.63)
Atkinson index ($e = 0.5$)	1	6.6 (0.62)	4.6 (0.63)	3.1 (0.63)	8.0 (0.81)	5.0 (0.83)	3.5 (0.84)	10.0 (1.11)	7.4 (1.10)	5.8 (1.09)
	2	21.3 (1.03)	5.3 (0.82)	3.6 (0.82)	21.0 (1.38)	5.7 (1.12)	3.9 (1.12)	33.0 (3.46)	8.6 (1.64)	6.4 (1.56)
	Total	13.4 (0.56)	5.3 (0.54)	3.4 (0.54)	16.3 (0.66)	5.7 (0.67)	3.8 (0.67)	19.3 (0.94)	8.4 (0.91)	6.3 (0.89)
$(e = 1.0)$	1	13.1 (5.78)	8.9 (6.16)	6.1 (6.17)	15.7 (7.30)	9.6 (8.03)	6.6 (8.06)	18.0 (8.62)	12.9 (9.33)	10.0 (9.35)
	2	43.3 (4.33)	10.1 (7.44)	6.9 (7.60)	42.4 (5.89)	10.7 (10.1)	7.4 (10.3)	56.4 (5.95)	14.7 (11.9)	11.0 (12.0)
	Total	31.1 (3.92)	10.3 (5.09)	6.7 (5.15)	35.6 (4.39)	10.8 (6.29)	7.2 (6.38)	40.9 (4.95)	14.9 (7.33)	11.0 (7.46)
$(e = 2.0)$	1	27.3 (1.20)	16.7 (1.09)	12.1 (1.16)	37.2 (3.67)	21.0 (3.22)	15.1 (2.85)	34.1 (1.98)	21.8 (1.74)	17.0 (1.79)
	2	93.4 (1.13)	18.9 (1.55)	13.8 (1.58)	90.4 (1.80)	19.9 (1.87)	14.3 (1.97)	95.3 (0.89)	25.2 (2.51)	19.5 (2.56)
	Total	92.8 (1.16)	19.7 (0.89)	13.5 (0.96)	90.4 (1.64)	22.1 (2.08)	15.5 (1.95)	95.1 (0.83)	25.9 (1.41)	19.1 (1.46)
Gini coefficient	1	28.2 (0.32)	23.7 (0.29)	19.4 (0.22)	31.2 (0.48)	24.5 (0.44)	20.0 (0.39)	33.6 (0.85)	28.3 (0.79)	24.4 (0.73)
	2	55.5 (0.90)	25.4 (0.50)	20.5 (0.43)	55.5 (1.11)	25.7 (0.67)	20.8 (0.59)	65.7 (2.80)	30.3 (1.30)	25.5 (1.17)
	Total	39.0 (0.35)	25.6 (0.26)	20.4 (0.20)	44.8 (0.45)	26.1 (0.36)	20.9 (0.32)	47.7 (0.79)	30.6 (0.67)	25.7 (0.62)

Household income is adjusted by OECD equivalence scale. FI = Factor income, GI = Gross income, DI = Disposable income. Asymptotic standard errors in the parentheses.

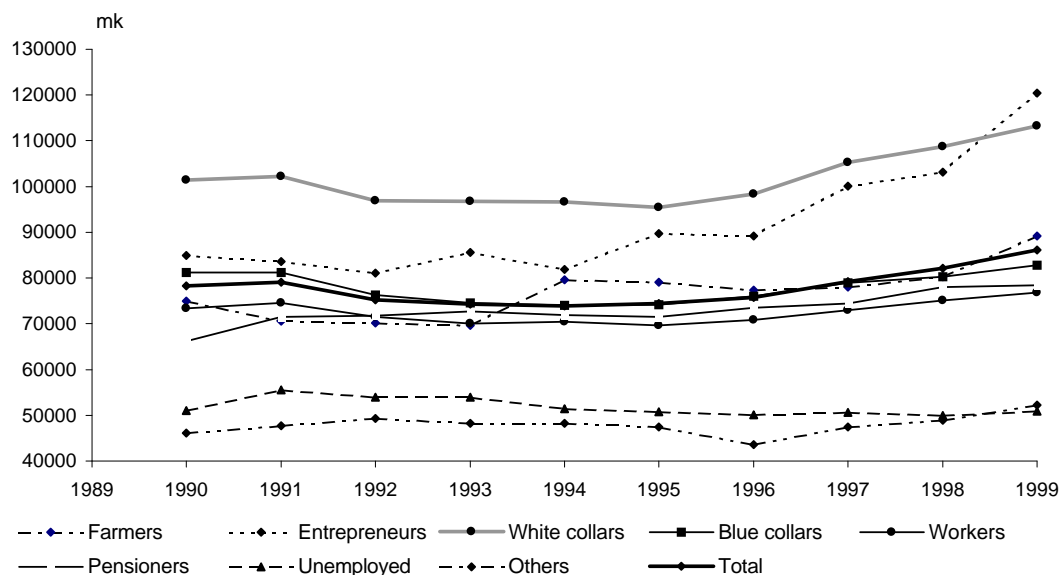


Figure 2: Real average disposable income (1995p) by socio-economic groups

groups. The purpose of this is to try to isolate where the growth in inequality is occurring. Figure 2 indicates that whilst the economy has grown significantly during recent years the fruits of that growth are not shared equally. There was a declining trend in the average disposable income of unemployed population (household head more than six months unemployed) while other groups have, on average, enjoyed more and less significant real income gains over the last 4-5 years. In particular, real disposable income has grown significantly in the case of entrepreneurs during the latter part of the 1990s. As for the differences between the mean incomes of various groups they have diverged. In particular, the mean income of the white collars group in 1990 was around twice that of the second poorest group (unemployed). This gap declined in 1993, but increased during the latter part of the 1990s.

The multifaceted nature of the inequality increase is well illustrated in Figure 3. It shows how the Gini coefficient indexed at 100 in 1990 rose for most of the groups in the period 1990-1999. Over the first six years under examination (1990-1995), the contribution of the unemployed population to overall inequality based on the Gini declined. It rose between 1996-1998. As we showed in the previous section the contribution of a particular group to overall income inequality, however, depends on

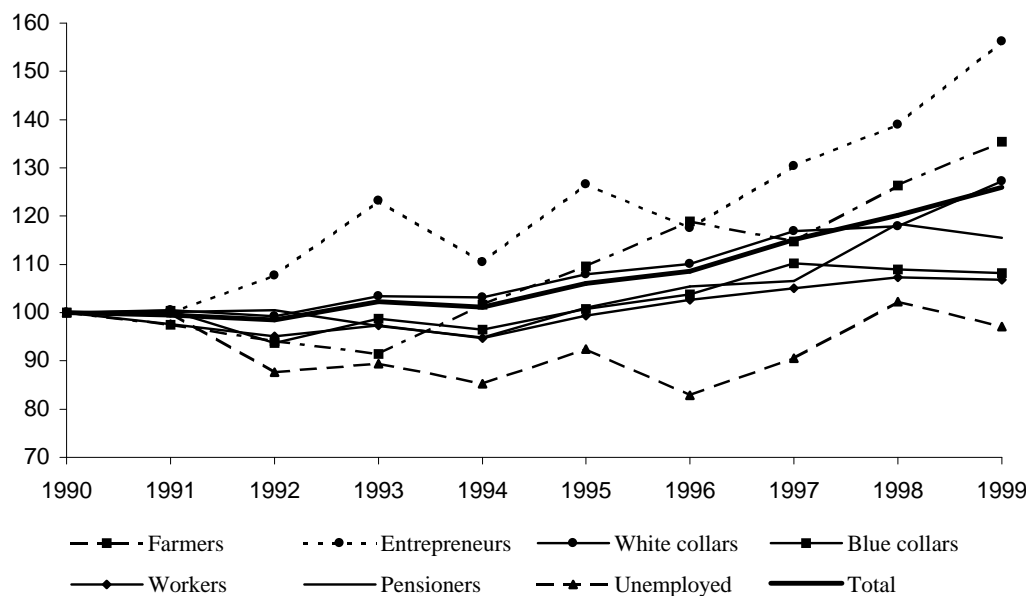


Figure 3: Gini coefficients for different socio-economic groups (1990=100)

the combination of two things – the extent of income inequality within the group and the size of the group. In the earlier period (1990-1993) these two factors were working in opposite directions. Between 1994 and 1999 the most significant increases occurred among households headed by farmers, entrepreneurs and white collars.

To gain further understanding of changes in income inequality between 1990 and 1999 we used a shift share analysis (Atkinson, 1992).⁷ This method is based on decomposition of inequality measures by household employment status. Table 3 shows, for generalised entropy measures and variance of log income, what would have happened to total inequality if subgroup population shares had changed from their 1990 levels to their 1999 levels, but other things had remained the same. If

⁷Although the process Kuznets (1955) hypothesised has gone into sharp reverse in Finland and other advanced countries, it does not mean that the analytical framework used by Kuznets (1955) could not be still useful. “Changes in the distribution of income are outcome of several forces operating in different directions. As the balance of these forces varies, we may expect the resulting trend in inequality to change direction ... The balancing of conflicting forces is evident from what is perhaps the most important legacy of Kuznets’ approach: the analytical framework for examining the contribution to overall inequality of different sectors of the economy.” Atkinson (1992, p. 26).

we take, for example, the variance of log income and replace the 1990 values for the share of those in work by that for 1999, then the calculated change is 8.2 per cent of actual rise. The actual total rise in income inequality from 1990 to 1999 was 5.5 percentage points. Then we repeat the same procedure showing impact of changes in group mean incomes, other things held constant. Finally Table 3 shows the impact of *ceteris paribus* changes in group inequalities. The quantification of the different effects depends on the choice of inequality measure. The most striking feature of the results in Table 3 is that in most cases the inequality changes between 1990 and 1999 are accounted for by changes in inequality within the work status subgroups, rather than by changes in relative subgroup sizes or average incomes. It appears that in the case of variance of log income 80 per cent of the inequality growth arose from inequality within the work status subgroups. The shift from employment only accounts for up 8.2 per cent of the increase. In sum, the results of decomposition analysis are confirmed by shift-share analysis.

Redistributive impact of taxes and transfers

We are especially interested in households' net income, that is, their income after they have received social security benefits and paid taxes on their income. Understanding the impact of taxes and benefits is a crucial part in understanding trends in inequality. The most obvious way to proceed is to examine the actual amounts of taxes paid and benefits received by households in groups 1 and 2 in our data and then look at how those have changed over time. Of course this approach is not without problems. Namely this approach is not able to distinguish between changes in the tax structure and changes in the distribution of the pre-tax income.⁸ Using the actual amounts of taxes paid and benefits received by households we may ask whether the redistributive role of government has fallen or not during the 1990s. Is it so that policy has contributed to the rise in inequality?

In considering the impact of taxes and transfers, we can distinguish between the automatic responses of budget to changing gross incomes and policy changes in the

⁸The alternative would have been to apply the 1990 tax and benefit system to the 1999 distribution of household income. The difficulty with this approach would be that it is not easy to trace all behavioural changes if the old tax and benefit system were reintroduced. Moreover it is not easy to reconstruct the old tax and benefit system. For these reasons we didn't adopt this approach.

Table 3

Shift-share analysis of inequality changes, in 1990-1999, based on employment status

I(c)	Year	Actual 100*I(c)	Population share		Means		Inequalities	
			Pred.	% change*)	Pred.	% change*)	Pred.	% change*)
<i>c</i> = 0								
	1990	6.95						
	1993	7.49	9.69	510.2	4.84	-392.6	7.12	32.0
	1998	10.39	9.24	66.5	4.96	-57.7	8.37	41.2
	1999	11.64	9.07	45.1	4.97	-42.1	6.07	-18.8
<i>c</i> = 1								
	1990	7.06						
	1993	8.07	4.72	-231.3	8.92	183.4	8.40	132.3
	1998	12.45	5.10	-36.2	9.07	37.2	13.50	119.5
	1999	15.35	5.25	-21.8	9.39	28.1	20.26	159.1
<i>c</i> = 2								
	1990	7.99						
	1993	11.01	4.29	-122.8	4.21	-125.5	5.72	-75.2
	1998	24.13	4.28	-23.0	4.34	-22.7	11.60	22.3
	1999	40.71	4.27	-11.4	4.50	-10.7	21.82	42.3
Lnvar								
	1990	13.96						
	1993	14.61	14.55	90.2	13.50	-70.8	14.65	106.5
	1998	18.84	14.45	10.0	13.96	0.1	17.98	82.5
	1999	19.45	14.41	8.2	14.23	4.9	18.33	79.7

*) % of actual change: $100 [\hat{I}_{t+1} - I_t] / [I_{t+1} - I_t]$, where \hat{I}_{t+1} is the predicted value for the period ($t + 1$)

tax and benefit system. There are a number of automatic mechanisms in taxes and benefits. For instance, the unemployment benefit system provides protection against loss of labour incomes, hence moderating the rise in inequality in gross incomes. This is just what happened in Finland in the beginning of the 1990s. Figure 4 shows how indicators of redistribution have varied over the 1990s. The Gini coefficient for factor income increased from 39 per cent in 1990 to 44.8 per cent in 1993, mainly due to rise in unemployment, but thereafter, it did not rise so rapidly. The rise in the Gini coefficient for gross income (including transfers) was less rapid up to the mid 1990s: the rise from 1990 to 1993 was 0.5 percentage point compared with a rise of 5.8 percentage points for factor income. After 1993 the situation reverses: the Gini coefficient for factor incomes rose by 2.9 percentage point from 1993 to 1999

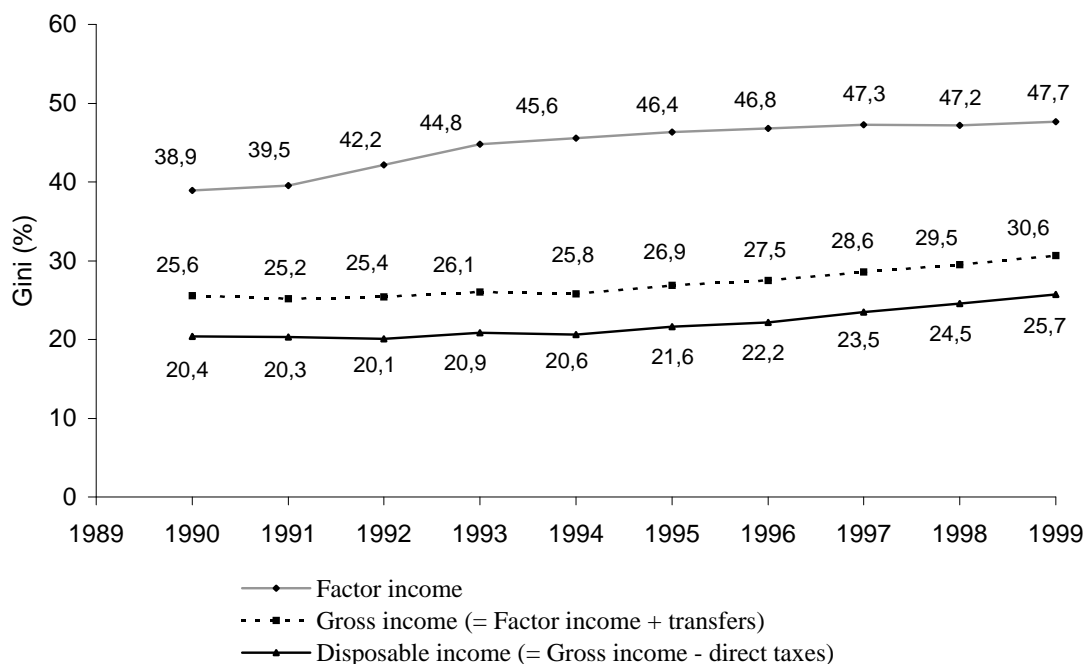


Figure 4: Gini coefficients of factor, gross and disposable incomes in 1990-1999

but for gross income the respective increase was 4.5 percentage points. The rise for disposable income was even larger, 4.8 percentage points. In Figure 5 the average redistribution of income measured in terms of the relative difference between the Gini coefficient of factor income and disposable income are given from 1990 to 1999. More formally

$$100 (G_F - G_D)/G_F, \quad (1)$$

where G_F and G_D are the Gini coefficients of factor income and disposable income respectively.⁹ We see that the redistributive contribution of direct taxes and transfers fell in all cases during the latter part of the 1990s. In other words over that period while factor income inequality rose, post-tax inequality rose faster still.

⁹Lambert (pp. 47-53, 1993) uses another method in measuring the redistribution effect on taxes. He calls the negative combination of reranking the difference of the Gini coefficient of post distribution and the concentration coefficient of post distribution ranked according the pre distribution the 'redistributive effect'. The general pattern obtained by Lambert's method remains the same as in Figure 5.

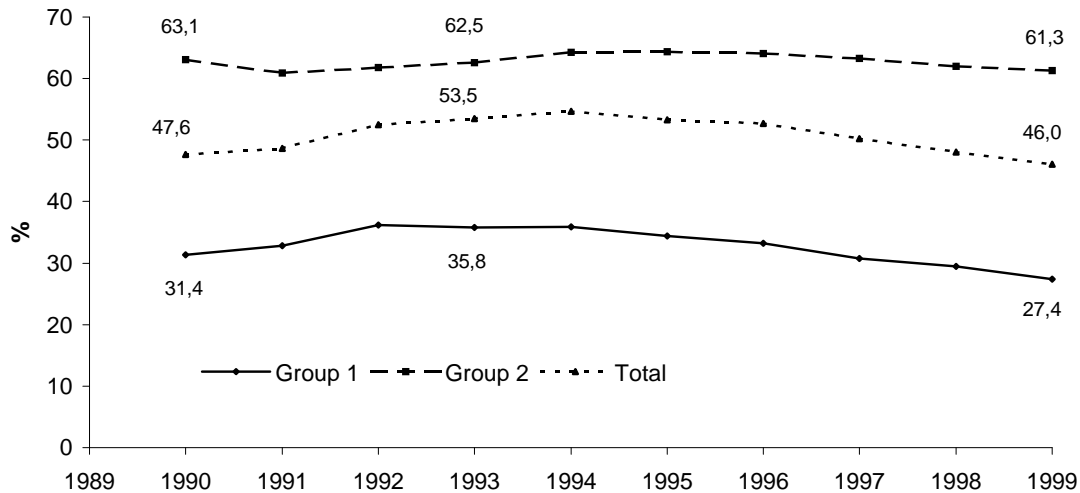


Figure 5: The extent of redistribution; for groups 1 and 2 and the whole population

4 Decomposition by income sources

So far we have looked at the income inequality treating income as a single lump. Of course people have incomes from different sources such as labour, capital and social security. These different income sources are distributed differently within the population. Next we examine some of major trends in the different sources of income. We use a measure that is decomposable in order to assess how changes in different income sources have affected overall income inequality. We break down total income into following components: labour income, entrepreneurial income, capital income, pensions and other transfers.

To see how the composition of income varies in different parts of the income distribution we show in Figure 6 composition of disposable income by decile. Throughout the last decade, labour income has made up the most important source of total household income, but its role is less important for poorer deciles in 1999 than in 1990. Figure 6 shows that the shares of labour income below the median have declined during the 1990s. For the poorest decile, labour income plays a rather minor role, making up about 40 per cent of the income of the poorest decile in 1990 and just over 30 per cent in 1999. Labour income provides over a half of income from the

second decile, reaching a maximum in the ninth decile. It falls back in the decile of richest tenth reflecting large receipts of capital income and entrepreneurial incomes in the top decile. The high level of capital income also reflects the considerable concentration of wealth and therefore income from wealth. In 1999 the tenth decile gets 40.5 per cent of its income deriving from capital, other deciles 14 per cent and less. Transfers provide the major part of income for the poorest deciles. They play an important role for some households even in the fifth and sixth deciles.

One way to looking at changes in the contribution of different income sources is to consider the share of each income component going to group 1 and group 2. Such figures are given in Table 4. They show among other things that the share of capital income in group 1 has grown during the 1990s. In fact we shall see that the reason for this is that capital income has risen significantly among entrepreneurs and white collars. The inequality in question is that of disposable household income. This is the household income after taxes and social security contributions. Disposable income could be expressed as the sum of incomes of all sources of gross income minus taxes and social security contributions. Here taxes and social security contributions are treated as a negative income.

Table 4

The shares of incomes by two groups 1990, 1993, 1998 and 1999

Income source	Year 1990		Year 1993		Year 1998		Year 1999		Total
	1	2	1	2	1	2	1	2	
Earnings	97.7	2.3	95.3	4.7	96.5	3.5	97.1	2.9	100
Capital income	64.5	35.5	63.2	36.8	68.0	32.0	71.6	28.4	100
Transfers received	42.9	57.1	37.0	63.0	35.5	64.5	35.9	64.1	100
Transfers paid	91.2	8.8	81.6	18.4	84.5	15.5	85.6	14.4	100
Disposable income	82.8	17.2	72.4	27.6	74.8	25.2	76.2	23.8	100

Another way of thinking about the same issue is to look at changes in the contribution of different income components to the squared coefficient of variation. By contrast to the decomposition analysis by population subgroups there are relatively few measures that will allow a convenient breakdown by component of income. Following the methodology of Shorrocks (1982) we use the squared coefficient of vari-

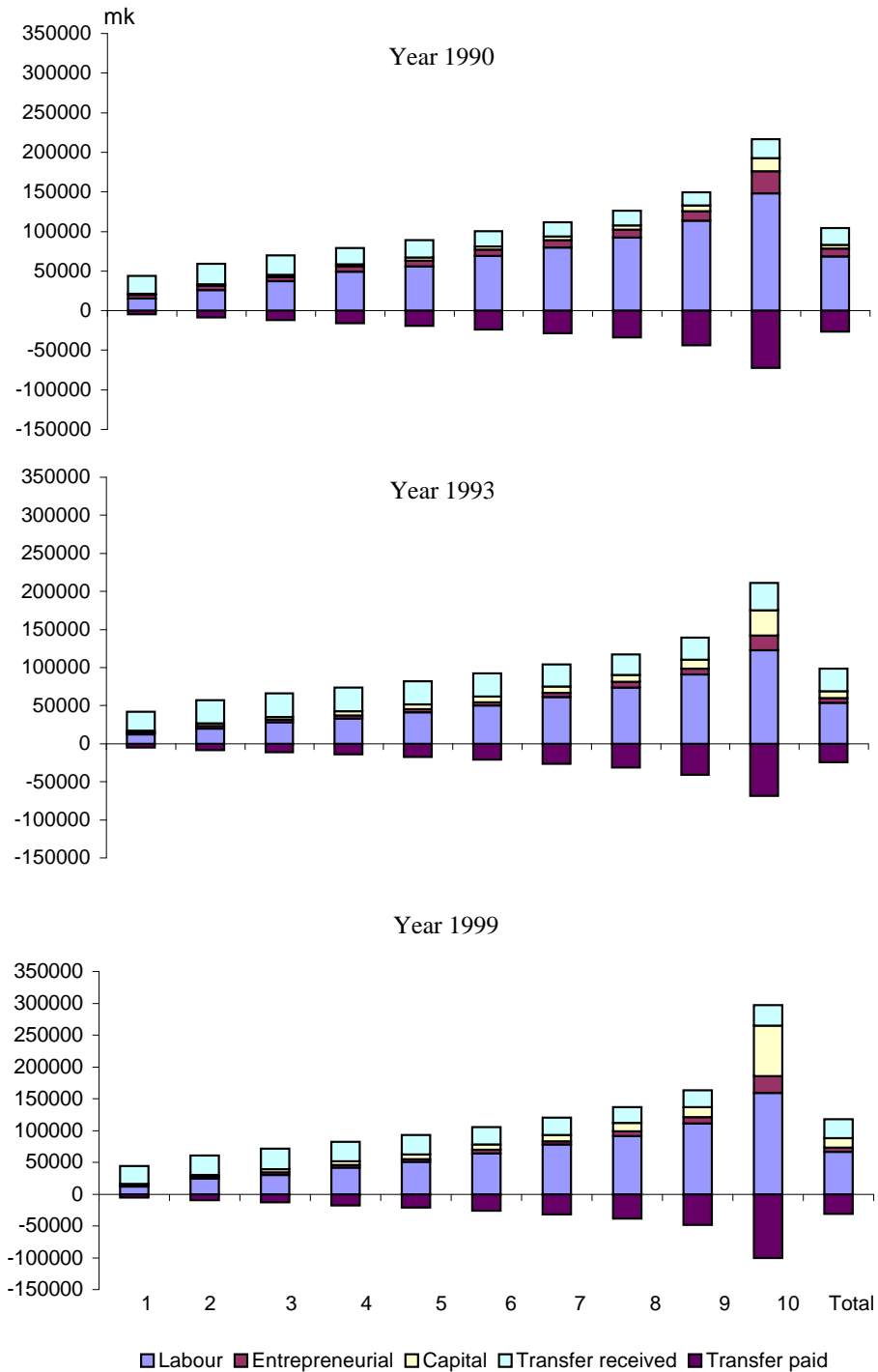


Figure 6: Income composition by deciles in 1990, 1993 and 1999

ation¹⁰. This measure can be readily broken down into its constituent parts. This measure is well defined even in the presence of income components with negative values. We define total inequality, I , as the sum of the contributions of each source of income.

$$I = \sum_k S_k, \quad (2)$$

where S_k is the absolute contribution of source k to total inequality. Now define

$$s_k = S_k/I \quad (3)$$

so $\sum s_k = I$, where s_k is the proportional contribution of source k to total inequality. When the squared coefficient of variation is used, the absolute contribution of a given income source is

$$S_k = cov(y_k, y)/m^2, \quad (4)$$

where m is mean income and y is total households income and $cov(.)$ is the covariance between the household incomes from source k and total income. The proportional contribution of each source to total inequality can be written as

$$s_k = cov(y_k, y)/\sigma^2 = \rho_k \sigma_k / \sigma, \quad (5)$$

where ρ_k is the correlation coefficient of between y_k and y , σ_k is the standard deviation of incomes from source k and σ is the standard deviation for total incomes.

The role of each income source in contributing to overall inequality is shown by Figure 7 and Tables 5–9. It is determined by three factors, the correlation between income from source k and total disposable household income, the share of income from source k in total disposable income, and within source inequality.

Figure 7 shows how the evolving level of total income inequality since 1990 has been generated by different disequalising contributions from these different sources of total household income. This figure has two especially striking features. First overall inequality has increased substantially, as we already have seen in the previous section. The sources of income inequality are in 1999 more diverse than in 1990, when the great majority of income inequality reflected inequality of earnings. By the late 1990s, the combined effects of other income (mainly capital income) sources has grown to be more important. Table 5 provides a detailed decomposition of inequality (CV^2 index) by income source for different group.

¹⁰See also Suoniemi (2000).

Table 5
 Decomposition of different group inequality by income sources
 in year 1990, 1993, 1998 and 1999

	CV^2	$100*s$				m_k/m				$\rho_{y_k,y}$			
		EI	CI	TR	TP	EI	CI	TR	TP	EI	CI	TR	TP
Year 1990													
CV^2		0.584	8.856	1.584	0.943								
Farmers	0.184	126	18	2	-46	97.6	12.3	19.1	-29.0	0.89	0.43	0.06	-0.74
Entrepn.	0.311	138	41	5	-85	121.4	10.1	13.2	-44.8	0.89	0.50	0.17	-0.87
Wcollars	0.123	165	17	1	-83	132.5	5.1	9.7	-47.2	0.91	0.42	0.03	-0.89
Bcollars	0.094	125	16	10	-51	114.9	4.4	14.1	-33.3	0.81	0.42	0.16	-0.82
Workers	0.081	147	10	-6	-52	111.5	2.9	16.6	-30.9	0.87	0.32	-0.09	-0.83
Pension.	0.159	31	28	90	-49	10.0	14.2	93.4	-17.5	0.48	0.58	0.79	-0.82
Unempl.	0.118	36	13	73	-22	38.8	6.8	70.2	-15.9	0.43	0.38	0.70	-0.67
Others	0.320	34	45	32	-11	45.3	8.7	56.8	-10.7	0.48	0.68	0.45	-0.49
Total	0.159	150	19	1	-69	99.7	6.6	27.1	-33.4	0.78	0.39	0.01	-0.85
Year 1993													
CV^2		0.872	6.935	1.001	1.034								
Farmers	0.156	99	24	15	-38	79.2	18.5	24.9	-22.6	0.82	0.55	0.30	-0.78
Entrepn.	0.784	82	72	1	-55	94.7	23.8	17.1	-35.5	0.78	0.81	0.03	-0.88
Wcollars	0.145	140	31	5	-76	122.5	10.5	15.0	-48.0	0.85	0.59	0.11	-0.88
Bcollars	0.086	138	21	-1	-58	104.6	7.9	21.5	-33.9	0.82	0.51	-0.01	-0.85
Workers	0.081	135	23	-6	-51	100.2	7.3	24.9	-32.3	0.79	0.48	-0.09	-0.81
Pension.	0.202	16	61	76	-53	8.3	19.3	96.3	-23.8	0.33	0.80	0.74	-0.82
Unempl.	0.115	60	31	46	-37	27.9	8.9	81.9	-18.7	0.55	0.53	0.52	-0.75
Others	0.335	9	61	51	-21	23.2	10.8	78.6	-12.6	0.17	0.79	0.68	-0.72
Total	0.220	105	46	9	-60	80.2	12.3	40.1	-32.6	0.66	0.67	0.10	-0.85
Year 1998													
CV^2		0.893	24.97	1.145	1.349								
Farmers	0.371	102	23	1	-26	87.6	17.8	19.7	-25.2	0.91	0.48	0.05	-0.72
Entrepn.	1.092	49	103	0	-53	89.3	38.1	13.6	-41.0	0.60	0.90	0.01	-0.93
Wcollars	0.281	95	71	-1	-66	126.4	13.4	11.9	-51.7	0.73	0.78	-0.02	-0.88
Bcollars	0.104	132	21	3	-56	108.9	9.0	19.8	-37.6	0.82	0.55	0.05	-0.86
Workers	0.095	150	15	-10	-55	108.9	7.1	20.7	-36.7	0.88	0.49	-0.17	-0.87
Pension.	0.810	8	116	21	-44	8.5	21.4	94.4	-24.3	0.26	0.93	0.43	-0.93
Unempl.	0.162	38	52	43	-32	20.4	8.9	87.9	-17.1	0.45	0.70	0.52	-0.84
Others	2.388	3	154	6	-63	29.3	14.6	71.1	-15.0	0.14	0.97	0.30	-0.97
Total	0.482	62	90	3	-55	85.8	15.1	35.7	-36.6	0.53	0.83	0.05	-0.89
Year 1999													
CV^2		1.002	39.69	1.314	2.142								
Farmers	0.498	93	34	0	-27	91.3	19.4	15.8	-26.5	0.89	0.56	0.00	-0.73
Entrepn.	3.066	15	129	3	-47	79.9	48.2	12.8	-40.9	0.39	0.97	0.16	-0.97
Wcollars	0.423	94	86	0	-80	125.6	14.9	11.2	-51.7	0.69	0.76	0.00	-0.91
Bcollars	0.132	98	33	15	-46	106.5	10.1	19.7	-36.3	0.72	0.63	0.24	-0.83
Workers	0.108	124	34	-8	-50	108.0	8.1	19.3	-35.4	0.80	0.55	-0.15	-0.88
Pension.	0.593	8	109	30	-47	7.2	22.1	94.4	-23.7	0.30	0.92	0.52	-0.94
Unempl.	0.175	30	70	31	-31	17.6	9.7	88.7	-16.0	0.45	0.73	0.44	-0.82
Others	3.432	2	142	1	-45	28.2	25.0	63.9	-17.0	0.10	0.98	0.05	-0.98
Total	0.814	43	108	3	-54	85.3	17.5	33.7	-36.4	0.45	0.89	0.06	-0.91

EI = Earned income, CI = Capital income, TR = Transfers received, TP = transfers paid

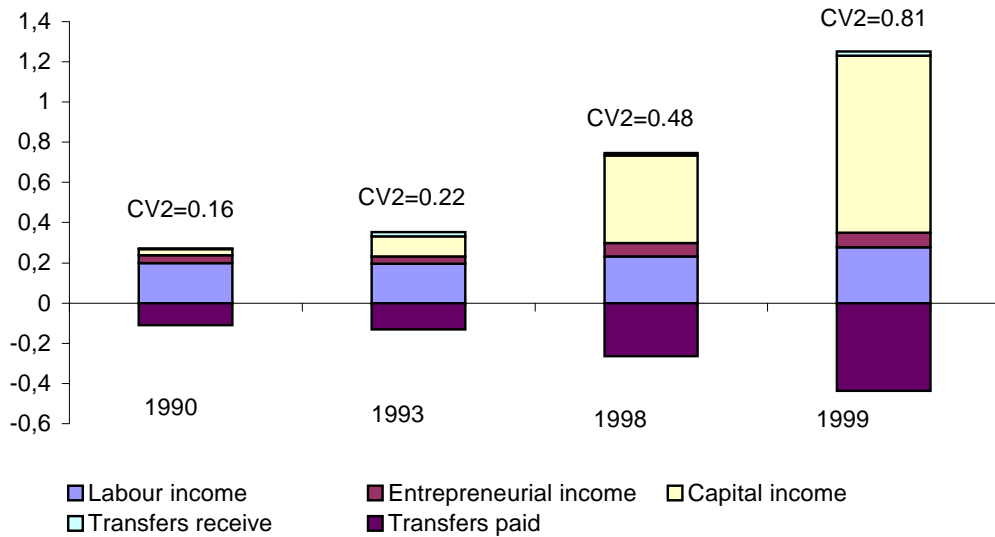


Figure 7: Decomposition of the squared coefficient of variation

Earnings and inequality:

Earnings are the biggest single source of income (85.3 per cent in 1999, see Appendix, Table A1), but their contribution to total inequality has declined over the 1990s. Earnings made the biggest contribution to total income inequality in 1990 and 1997, but not anymore in 1998 and 1999 (see Table 5). Within source inequality for earnings has actually fallen over the period and it is in fact relatively low compared with within-source inequality for the other income sources. There are two reasons why earned income is still an important contributor to total income inequality. The biggest component of disposable income is earnings and furthermore, earned income has high correlation with total disposable income.

As it can be seen in Table 5 in 1999 43 per cent and in 1993 105 per cent of the total income inequality is attributed to earnings.¹¹ Table 6 shows decomposition

¹¹Individual contributions can exceed 100 per cent, since some of the components are negative (see Figure 6).

according to labour income. The picture is very much the same as it was in the case of earnings. This is simply so because the major part of earnings comes from labour income.

Table 6
Labour income and inequality

	Year 1990			Year 1993			Year 1998			Year 1999		
	1	2	Total	1	2	Total	1	2	Total	1	2	Total
$100*s_k$	122.9	12.5	123.4	97.2	9.7	88.5	65.3	2.6	48.3	34.1	3.5	34.2
CV_k^2	0.389	5.359	0.706	0.493	4.354	1.021	0.472	6.339	1.000	0.590	5.445	1.149
m_k/m	1.040	0.095	0.877	0.946	0.119	0.718	1.002	0.086	0.771	0.985	0.079	0.769
ρ_k	0.721	0.242	0.670	0.666	0.184	0.573	0.561	0.114	0.435	0.399	0.169	0.374

Capital income and inequality:

Capital income has always been highly concentrated and so changes that increase the importance of capital income in household income have a disequalising influence. Capital income is a source of income whose contribution to overall income inequality has risen dramatically over the 1990s. This is because the number of households receiving large amounts of capital income from property, share income and capital gains has risen. A notable example is the increased personal ownership of equities, especially during the latter part of the 1990s. During the 1990s there has been the substantial shift of wealth for the stock market. The share of capital income in total income has risen from 6.6 per cent in 1990 to 17.4 per cent in 1999. For those not in work (group 2) the share has risen from 13.6 per cent in 1990 to 16.4 per cent in 1999. The reason can be found from the corresponding figures for pensioners; 14 per cent in 1990 and 22 per cent in 1999 see Table 5. This has meant that capital income has become increasingly positively correlated with total disposable household income; it is high income households in which the receipt of large amounts of capital is concentrated. Hence, as can be seen in Tables 5 and 7 the impact of capital income as contributor to overall inequality has been increased. In 1990 only 19 per cent of the income inequality of the total net income is attributed to incomes from this source while in 1998 that figure is 90 per cent and in 1999 108 per cent. The dominant contributor to overall inequality in Finland during 1990-1997 was

earnings. Since 1998 capital income was the number one.¹²

Table 7
Capital income and inequality

	Year 1990			Year 1993			Year 1998			Year 1999		
	1	2	Total	1	2	Total	1	2	Total	1	2	Total
$100*s_k$	20.1	29.4	19.0	45.9	56.2	46.4	74.4	117.8	90.1	108.7	115.1	108.1
CV_k^2	13.88	2.352	8.85	8.671	4.337	6.937	16.89	40.28	24.98	43.88	28.69	39.70
m_k/m	0.051	0.136	0.066	0.107	0.163	0.123	0.137	0.192	0.151	0.164	0.208	0.175
ρ_k	0.401	0.597	0.389	0.663	0.782	0.674	0.782	0.924	0.831	0.887	0.926	0.887

The contribution of entrepreneurs to income inequality rose markedly during the 1990s (see Table 5). This is simply because capital income has become a more important income source for this group. The factor share of capital income for this group has risen from 10.1 per cent in 1990 to 48.2 per cent in 1999. At the same time capital income of entrepreneurs has become more unequally distributed amongst this group and has also steadily become more positively correlated with total income over the period. These three factors together explain the disequalising effect of capital income for this group. The 1993 tax reform, so-called dual income tax system, is undoubtedly one of the key factors responsible for this trend. This view is supported by the fact that the share of entrepreneurial income indicates a declining trend over the period. The dual income tax system requires a splitting of the income of the self-employed and the income of active owners of firms into a labour income component and a capital income component. Since the two components cannot be observed directly, this splitting gives rise to a number of practical problems. On the other hand, the dual income tax system creates new room for tax avoidance through the transformation of labour income subject to high marginal rates into capital income subject to low marginal rates. In fact critics of the dual income tax system warned of this kind of distributional consequences.

Social security and taxes and inequality:

The main source of income for those not in work is in fact social security. Therefore, it is important to know the redistributive impact of transfers during the 1990s.

¹²Results for the lacking years are available from the authors.

Table 8 shows that the proportional contribution of social security income to the squared coefficient of variation first rose (in 1993 8.8 per cent) and then came down (in 1999 2.6 per cent). It is hardly surprising, as Table 8 shows, that the majority of social security income is paid to those not in work.

Table 8
Social security

	Year 1990			Year 1993			Year 1998			Year 1999		
	1	2	Total	1	2	Total	1	2	Total	1	2	Total
$100*s_k$	1.2	89.3	0.5	0.5	77.0	8.8	-1.1	22.6	2.8	1.9	25.2	2.6
CV_k^2	1.498	0.295	1.584	0.918	0.284	1.001	1.002	0.279	1.145	1.721	0.290	1.314
m_k/m	0.141	0.903	0.271	0.205	0.917	0.401	0.169	0.915	0.357	0.159	0.908	0.337
ρ_k	0.026	0.772	0.006	0.011	0.747	0.103	-0.04	0.446	0.050	0.083	0.461	0.061

The proportional contribution of income taxes and social security to overall inequality was -69 per cent in 1990 and -44 per cent in 1999 (see Table 9). Hence the contribution of taxes and transfers in alleviating income inequality declined during the 1990s in Finland.

Table 9
Income taxes and social security contributions

	Year 1990			Year 1993			Year 1998			Year 1999		
	1	2	Total	1	2	Total	1	2	Total	1	2	Total
$100*s_k$	-71.2	-43.8	-68.9	-62.2	-47.2	-60.0	-57.8	-47.0	-54.7	-42.9	-36.6	-43.6
CV_k^2	0.742	1.941	0.945	0.8	1.642	1.034	0.869	4.559	1.35	1.706	3.843	2.142
m_k/m	-0.37	-0.17	-0.34	-0.37	-0.22	-0.33	-0.42	-0.23	-0.37	-0.41	-0.22	-0.36
ρ_k	-0.85	-0.78	-0.85	-0.86	-0.80	-0.85	-0.89	-0.93	-0.89	-0.90	-0.95	-0.91

5 Conclusions

In this study income inequality in Finland was investigated using a decomposition analysis by income group and income source. We have offered some explanations for the recent trends or episodes in income inequality, focusing on changes in employment status, different sources of incomes and the redistributive role of the government budget. Several conclusions can be drawn from the results. Total inequality

rose significantly during the latter part of the 1990s. The clear conclusion of decompositions is that variations within groups were far more important in accounting for total inequality than variations between groups. As a general pattern inequality rose proportionately more within those socio-economic groups with growing capital income shares. In particular among entrepreneurs this share grew most significantly during the 1990s. The results show that capital income although it appears to represent only 17.4 per cent of the total equivalent household income in 1999 makes by far the most significant proportional contribution to overall inequality. The 1993 tax reform, a so-called dual income tax system, is undoubtedly one of key factors responsible for this trend. Rising unemployment in the early 1990s, perhaps surprisingly, did not increase income inequality. More importantly, the number of the unemployed below the poverty line (50 per cent of national average income) has risen from 1994. Since 1991 there was a declining trend in the average real disposable income of unemployed households. This is without due to those policy measures cutting the redistributive impact of transfers, which have led inequality of disposable income to increase more than that of factor income.

The interpretation of our results raises several issues such as the incidence of taxation, life-cycle considerations, the valuation of public spending of goods and services etc. But, taken at face value, our results suggest that the government budget has ceased to offset the rising inequality of factor income and that the increase in inequality during the latter part of the 1990s was attributable to reduced redistributive efforts of the government.

What might be an explanation of this evolution of redistribution policy in Finland during the 1990s? An analytical framework for thinking through redistribution policy is put forward by James Mirrlees in his Nobel Prize winning paper (Mirrlees, 1971). Three elements of the Mirrlees model are useful for our purposes. First is the concept of inherent inequality (factor income inequality) reflecting among others skilled/unskilled wage differentials, asset inequality and social norms. Second is the egalitarian objectives of the government. Third is the level of incentive and disincentive effects. In other words the redistribution policy is the product of circumstances and objectives. Kanbur-Tuomala (1994) shows that when inherent inequality increases the optimum income tax system becomes more progressive, taxing the better off at higher rates to support the less well off. Thus, one of the policy responses in rise of inherent inequality should be a greater willingness to redistribute

through the tax and transfer system. Or is it so that the redistributive objectives of our politicians have become less egalitarian during the 1990s?

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Appendix A

Table A1

The share (in percentages) of income from different sources in total disposable household income 1990-1999 (OECD-units)

Income categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Earned income	99.7	93.0	89.1	80.2	81.5	84.6	85.1	84.7	85.8	85.3
Labour income	87.7	82.6	79.0	71.8	71.8	74.7	76.5	75.7	77.1	76.9
Entrepreneurial income	12.0	10.4	10.1	8.4	9.7	9.9	8.6	9.0	8.7	8.4
Capital income	6.6	8.4	8.8	12.3	12.1	11.3	12.3	13.8	15.1	17.4
Factor income	106.3	101.4	97.9	92.4	93.7	95.9	97.4	98.5	100.8	102.7
Transfer received	27.1	30.0	36.6	40.1	41.9	41.4	40.3	37.7	35.7	33.7
National social security benefits	7.0	7.0	7.5	7.4	7.2	7.0	6.6	6.0	5.6	5.1
Occupational social security benefits ¹	12.5	13.1	14.6	15.6	16.2	17	17.4	16.8	16.2	15.8
Social benefits	4.7	5.5	6.8	6.6	8.3	8.1	7.3	7.0	6.8	6.3
Unemployment benefits	1.3	2.8	5.8	8.0	8.1	7.3	6.9	6.1	5.0	4.4
Other transfers received	1.6	1.6	2.0	2.5	2.1	2.0	2.1	1.9	2.1	2.1
Gross income	133.4	131.4	134.5	132.6	135.5	137.3	137.7	136.2	136.5	136.4
Transfers paid	-33.4	-31.4	-34.5	-32.6	-35.5	-37.3	-37.7	-36.2	-36.5	-36.4
Direct taxes	-32.3	-30.3	-33.4	-30.0	-31.9	-32.5	-32.6	-30.9	-31.3	-31.2
Other transfers paid	-1.1	-1.1	-1.1	-2.6	-3.7	-4.7	-5.2	-5.3	-5.3	-5.3
Disposable income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Transfers received outside	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
Transfers paid outside	-2.7	-2.6	-2.8	-3.5	-3.2	-3.3	-3.1	-2.9	-3.0	-2.8

¹ Unemployment benefits excluded

We have divided the population into two groups: those households where household head is in work and those households where household head is not in work. From Table A2 we can find that the non-working has increased its share from 21.1 in 1990 to 29.1 in 1999. The reason for this is the rise of the unemployed households as we can see in the lower part of the Table A2. We also perform further splitting by socio-economic status in both groups.

