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WAS THE BURDEN OF THE DEEP SWEDISH RECESSION EQUALLY SHARED?

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The development of income inequality in Sweden up to 1998 is described and analyzed using yearly data focusing on the 1990s when average income fell rapidly and unemployment sky rocketed. Inequality in equivalent disposable income increased during the 1990s as during most of the 1980s. Decomposing total inequality by population groups and studying the earnings of full-time workers shows that while many groups experienced drops in income during the 1990s, some large groups did not. Examples of the latter are pensioners and full-time workers. Young adults and recent immigrants are examples of the former. Decomposing the Gini-coefficient by income source indicates that forces leading to increased inequality during the 1990s differed from those at play during the 1980s.

1. INTRODUCTION

During the past two decades the distribution of income has become more unequal in many OECD countries. Surveying evidence from the end of the 1970s to the middle of the 1990s for various OECD countries, Gottschalk and Smeeding (2000) note that inequality has increased in most, but not all countries. In their ranking of countries surveyed according to how fast the Gini-coefficient for disposable equivalent income had increased, Sweden came second, outranked only by the United Kingdom. There is evidence that there has not been much more change in the U.K. during the 1990s (Jenkins, 2000). For Sweden, this is not the case, however. The results we report here show that the trend has continued.

In the two decades from 1980, Sweden went through two cycles of deep recession (1980–83 and 1991–95) and recovery (1984–90 and 1996 to date). In a previous study covering the period 1975–91 (Gustafsson and Palmer, 1997), we have shown that a trend towards greater inequality began in the early 1980s and was driven by increased earnings inequality, beginning with the recovery of 1983–84. This study updates the evidence through 1998, but more importantly attempts

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to explain what lies behind a continued increase in inequality in household income in the 1990s.

Our results show that the face of recovery is much different in the 1990s from the 1980s. Higher deciles and more established workers—aged 35 and older at the onset of the recession in 1990—were much more insulated from the events of the early 1990s, and have come out much stronger in the recovery. The average income of the elderly remained unchanged. On the other hand young adults, single parents and recent immigrants shouldered much of the burden of the macroeconomic shock. Furthermore, our results show that using a measure proposed by Sen (1976), a major conclusion of the study is that when both growth and the distribution of income are taken into consideration, Sweden is no better off in 1998 than it was in the initial years of the 1980s.

The paper is organized as follows. The next section describes the economic background of the 1990s. Section 3 discusses the source of data and the use of this database. In Section 4, we report on the development of average equivalent disposable income. While we use the same source as Gottschalk and Smeeding (2000) our description uses more years and measures of inequality and is more detailed. This paper uses the annual Household Income Survey from Statistics Sweden through 1998, which was also the source of data for our previous study of the period 1975–91.

The aim of this paper is to examine what has happened with the distribution of welfare in Sweden over time, focusing on the 1990s. To achieve this goal, three different analyses are performed. First, in Section 5, we study people employed full-time and throughout the year. One central finding is that the macroeconomic shock in the beginning of the 1990s led to a drastic drop in the number of people who were full-time earners during the entire year. However, unlike in the recession at the beginning of the 1980s, the real earnings of full-time workers were hardly affected.

In Section 6 we follow up this analysis by decomposing total inequality in equivalent disposable income measured by the Gini-coefficient by source of income. This enables us to see how changes in rewards from the factor market, as well as changes in expenditures and revenues of the welfare state have affected income inequality. In Section 7, using an additively decomposable inequality index, we decompose total inequality to examine changes by age, as well as some alternative breakdowns. We bring these results together in Section 8 of the paper.

2. From Deep Recession to Renewed Growth in the 1990s

The experience of Sweden during the 1990s was exceptional in several respects. Prior to the 1990s, Sweden was characterized by high equality in the distribution of income, a low unemployment rate and generous welfare systems. In the 1980s, deregulation of the credit market and excessive bank lending for real estate created a financial bubble that eventually burst in 1990.[1] From a low of around 4 percent, with 2 percent open unemployment and 2 percent in training in 1989, unemployment skyrocketed up to 14 percent in 1993. GDP *fell* by 5

[1]The banking crisis is discussed in Ingve and Lind (1996).

percent in 1990–94, and Sweden had gone almost overnight from growth to its deepest recession since the 1930s.

In 1990, 84.5 percent of the population aged 16–64 were in the labor force. As the recession deepened the labor force shrank and by 1995 participation had fallen to only 78.2 percent. The downturn of the economy affected various groups of the population differently. Young adults constituted the main group excluded from the labor market, joined by new immigrants. In the latter half of the 1980s around 15 percent of persons aged 20–25 were outside the labor force, a large percent of which were students. By 1996–97, the figure had climbed to 35 percent. The next age group affected was the group aged 26–35, in which non-participation increased from around 5 percent to 10 percent. Participation of other age groups, including persons 56–65 years of age, was practically unchanged. The recession had clearly restricted new entrance into the labor force.

Younger persons were not only excluded from the labor force. Younger workers were also the most likely to become unemployed. In the peak unemployment year of 1993, the unemployment rate among those aged 16–24 was 18.4 percent, compared to 10.5 percent for persons 25–34, 5.4 percent for persons 35–54 and 5.5 percent for persons 55–64. Generally, ''insiders'' with a work history were better protected from the financial consequences of unemployment than young adults and new immigrants who had not passed the threshold into job security.

The depth of the recessionary impact on unemployment is illustrated by the following (Lundborg, 2000). In 1990 around 7 percent of the native-born labor force were unemployed at some time during the year, whereas in 1993–97 this figure was 17–20 percent. For non-native residents, the figure went from about 14 percent in 1990 to 30–33 percent in 1993–97. These figures began to fall after 1997. Although discriminatory by age, an examination of the socio-economic distribution of the increase in unemployment suggests that, with the exception of young male workers in industry—with a pronounced higher chance of becoming unemployed—the recession was ''non-discriminatory'' (Lundborg, 2000) in its effect among social groups.

The recession had yet another important effect in the present context. Employment among women 20–39 years of age declined from a level of 85 percent in the latter half of the 1980s to below 70 percent by 1996–97. The decrease in labor market participation and increase in the unemployment of younger men and women is believed to be the main explanation of the rapid decline in the birth rate (Hoem, 2000).

Expenditures on unemployment compensation increased exponentially from 1990 through 1995. With falling income, tax revenues fell too, and this led to rapidly increasing budget deficits. This took place just after a large tax reform had been institutionalized.[2] As a consequence several transfer systems (but not

[2]The tax reform had two components, decreases in tax rates and broadening of the tax base, accompanied by increases in transfers to families with children (child and housing allowances). In Gustafsson and Palmer (1997) we report that the redistributive effects of taxes decreased substantially in 1991 but were offset by increased redistributive effects of transfers. This was in line with distributional effects simulated in a study prior to the reform (Schwarz and Gustafsson, 1991). While the labor supply effects of the reform have attracted much attention among researchers, there are fewer studies addressing how the income distribution changed. One such study is Aronsson and Palme (1998) reporting that results depend to a large extent on both the income inequality measure and income concept used. On this issue see also Björklund *et al*. (1995) and Agell *et al*. (1998).

unemployment compensation) were trimmed, budgets for many welfare systems cut back and income taxes increased. Employee contributions to social insurance were reintroduced and gradually increased to 6.95 percent of earnings in 1998. Also, tax rates at the higher end of the income distribution were increased. Unemployment benefits and huge deficit financing of transfers cushioned the drop in average disposable income.

Figures from the OECD on GDP growth for its member countries for the years 1990–98 place Sweden very close to the bottom with an annual growth rate of only 1.0 percent. Sweden outperformed only Switzerland, Hungary and the Czech Republic. The Swedish growth rate for the period was only half as high as in Austria, Canada, the United Kingdom and Spain and only one third of the growth rate of the United States. Although GDP increased again from the mid-1990s, changes in real income were modest, and the unemployment rate fell only slowly in the initial years.

The changing macroeconomic scene and the response of politicians determined how different groups fared in the 1990s. Yet, there was much more going on at the same time. The stock market blossomed and equities became more than ever a normal means of saving for households. By the end of the 1990s around 60 percent of all households were shareholders, and the stock market was creating wealth for the better-off.

As Sweden moved out of the recession in 1994–95, a clear division between insiders and outsiders had emerged. Well established—and by definition usually older—households were borrowing less, saving more and were more reliant on the development of the stock market for their well-being.[3] Younger households were more likely to be outside the labor force, were spending more time in education, were more likely to be unemployed, and, generally, were more likely to have a looser attachment to the labor force. In addition, they were not giving birth to children to the same extent as earlier cohorts.

3. The Swedish Household Income Survey

As in Gustafsson and Palmer (1997), our analysis is based on the Swedish Household Income Survey (HINK) compiled by Statistics Sweden. The tax register is the main source of information for income sources and taxes. This is supplemented annually with survey data from around 10,000 households. Our study has an emphasis on annual data for 1991–98, but we also use data from earlier years. This creates a methodological problem because the tax base was broadened—to include both more of compensation in kind and realized capital gains previously not subject to tax—from 1990. To enable comparison both forwards and backwards over years, Statistics Sweden has compiled data using both old and new definitions for 1989 and 1990. The change in definitions led to an increase in household factor income of about 5 percent. This can be attributed equally to earnings and to capital income.[4]

[3]The large group of persons born in the 1940s moved into a life-cycle saving phase in the 1990s. See e.g. Lindh and Malmberg (1999).

[4]There are also other changes in methodology over the years, for example the sample size has changed. However, most likely they are of less importance for the results.

A household consists of adults and children up to the age of 18. Multi-family households and children 18 years old and older living at home are treated as separate households. Information on earnings, taxes and most transfers is obtained from registers, supplemented by additional information obtained from telephone interviews.[5]

We base much of our analysis on equivalent disposable income. Equivalent disposable income is obtained by dividing disposable income with an equivalence scale, which follows social assistance norms recommended by the National Board of Health and Welfare (*Socialstyrelsen*), including an adjustment for housing costs, based on regional costs. The norm is based on the number of adults in the household and the number and ages of children (0–3 years, 4–10 years and 11–17 years).[6] Individuals constitute the unit of analysis in this study. We assume consumption opportunities are equally shared within the household, which means that all household members have equal shares in household income.

4. The Development of Equivalent Income and its Distribution

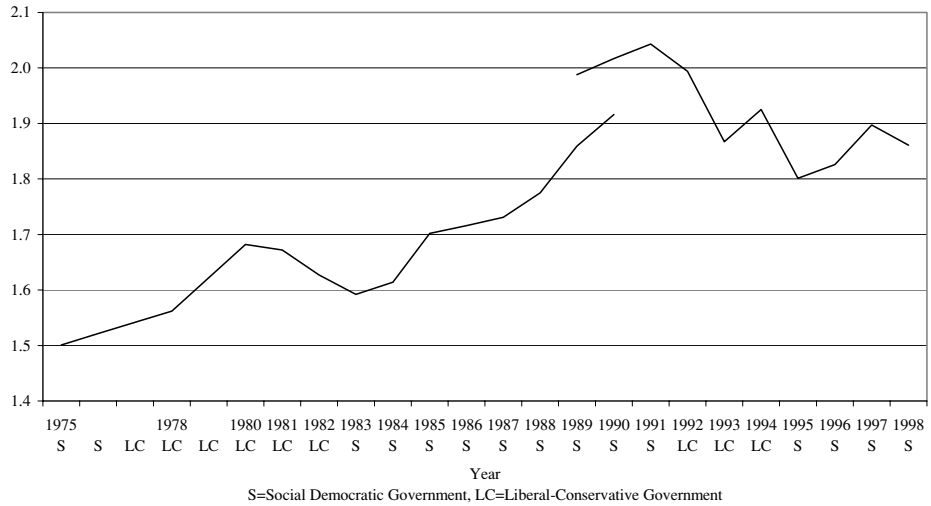
In this section we describe the development of average equivalent income and income inequality in Sweden with an emphasis on the 1990s. Figure 1 shows the development of average disposable equivalent income (EDI). First, note that the broadening of the tax base in the beginning of the period led to higher recorded EDI. The highest level for the series was reached in 1991 after which average real EDI fell during four years. In 1995 the level was 11.8 percent lower than in 1991. This is indeed a large drop for any OECD country. Even with growth in subsequent years the level in 1998 was still around 9 percent lower than in 1991. Gains in real average disposable equivalent income achieved during the latter half of the 1980s were lost during the first half of the 1990s.

The recession in the 1990s was much deeper than that in the early 1980s. From the downturn at the beginning of the 1980s it took five years before the preceding maximum for average EDI was reached. After the same number of years from when the next recession started in 1991, average equivalent disposable income had only increased slightly from its bottom level. When we finally close the books, it is likely that it will have taken until the end of the decade for average disposable equivalent income to have returned to its pre-recession level in 1991.

What happened to income inequality during this period? As in our previous study, we compute three inequality indices—the Gini-coefficient, the MLD index and the Theil index—for each year. The results are reported in Figure 2, where the value for each index for 1991 is set equal to 100, and in the Appendix. With the new income definition for reported income all indices give greater income inequality.

[5]As a response to a long standing critique Statistics Sweden has modified the Household Income Survey making it possible, starting in 1993, to use an alternative household definition which also includes persons over 18 living with their parents. However, it is not self-evident that assuming complete pooling of resources between adult children and their parents is a more realistic assumption than assuming no pooling. Jansson (2000) reports Ginis for the period 1993–97 based on the broader definition of a household. His numbers are lower than those reported in this study. However, they show essentially the same development over time as is presented here.

[6]A property of our procedure is that the value of 1.0 for EDI can be used as a poverty line. Some readers might prefer to label EDI a "welfare ratio."



Note: Due to broadening of the tax base more income is observed since 1990.

Figure 1. Development of Average Equivalent Disposable Income. Ratio to the Social Assistance Norm with Housing Costs, 1975–98

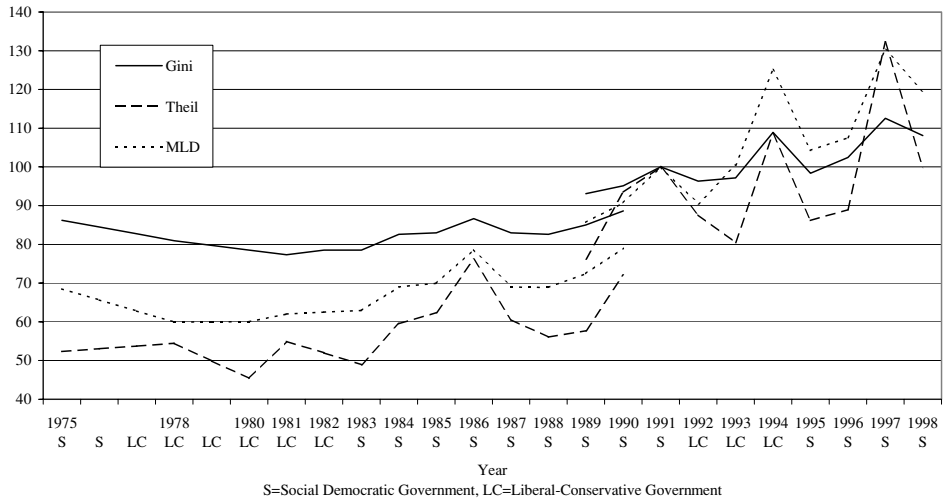


Figure 2. Inequality in Equivalent Disposable Income, 1975–98. Index 1991 = 100, 1975–98

Income inequality in Sweden fell from the mid-1970s until around 1983 (e.g. Gustafsson and Palmer, 1997), when it started to increase. In Figure 2, all three indices show a profound increase in income inequality during the 1990s.[7] For example, the Gini-coefficient went from 24.7 percent in 1991 to 27.8 percent in

[7]For example the Lorenz-curve for 1997 dominates the ones for all other years (although the dominance is only weak for 1998). The Lorenz-curve for 1998 dominates most previous ones, with the exception of 1994, which it intersects, and 1997. The curves for 1996 and 1995 both indicate lower inequality than in 1994.

1997. However, the development is far from smooth, as there are spikes in 1994 and 1997, which can also be observed in the annual publications from Statistics Sweden (i.e. based on the same underlying data). Income inequality in 1998 is higher than at the beginning of the period in 1975 according to all indices.

Much of the pattern of change in income inequality in Sweden can be captured by analyzing changes between 1975, 1983, 1990(91) and 1998.[8] In addition, we examine the recession period 1991–95 and the following expansions 1995–98. Table 1 shows how decile EDI has changed during these sub-periods. Starting with 1991 to 1998 there is a very clear pattern. The largest drop is in the lowest decile, where income in 1998 was as much as 21 percent lower than in 1991, followed by decile 2 where the drop was 13 percent. The higher the decile, the lower is the drop in income and for the highest decile income in 1998 was 4 percent lower than in 1991. Looking at the periods 1991 to 1995 and 1995 to 1998 separately we find that the positive development for the highest decile is entirely due to the latest years' development, when income increased by 11 percent.

TABLE 1

RELATIVE CHANGE IN EQUIVALENT DISPOSABLE INCOME BY DECILE

Decile	Change 1975–83	Change 1983–90	Change 1991–98	Change 1991–95	Change 1995–98	Change 1975–98*
1	6.9	9.7	–21.0	–18.1	–3.6	–11.0
2	13.7	13.4	–13.2	–10.8	–2.8	14.6
3	13.3	14.6	–11.0	–9.6	–1.5	18.3
4	11.5	16.7	–10.9	–10.6	–0.3	18.7
5	8.5	18.2	–10.2	–10.8	0.8	18.2
6	6.6	19.0	–9.9	–10.8	1.0	17.9
7	5.0	19.6	–9.3	–11.1	1.9	18.7
8	3.7	21.3	–8.8	–11.4	2.9	21.6
9	3.7	21.5	–7.6	–10.7	3.5	25.3
10	1.6	30.9	–4.3	–14.4	11.9	51.0
All	6.1	20.4	–9.1	–11.8	3.2	23.8

Note: The tax reform of 1990–91 broadened the income tax base by about 5 percent. The change affected mainly persons in the higher deciles, which is also reflected in Figures 1 and 2. For this reason measured income is not fully comparable before and after the reform.

Deciles that lost the most in real EDI during the period 1991 to 1998 were the ones that gained the least during the period 1983 to 1990. Thus while the first decile gained 10 percent in income from 1983 to 1990, it lost 21 percent from 1991 to 1997. At the other end of the distribution while the top decile gained 31 percent from 1983 to 1990, people in this decile lost only 4 percent from 1991 to 1998. This pattern is very different from what happened between the years 1975 and 1983. During this period the highest growth was observed for decile 2, and the lowest for the highest decile.

When comparing our results with other studies of the development of income inequality using the same source it should be understood that years studied as

[8]We do not cover the development 1990 to 1991 when the definition of income was changed. The periods have been chosen so that the reported numbers for the third sub-period are not affected by changes in the definition of income.

well as definitions can affect the conclusions. Authors who work with data from the Luxemburg Income Study only are limited to studying only a few years. As our study shows, it is important to examine all years. For example, Smeeding (2000) finds no change in inequality between 1992 and 1995, which is consistent with what we report for those two years.

Some authors have worked with data for several years during the 1990s. Eriksson and Petterson (2000) present Gini-coefficients for 1989–97 showing no statistically significant increase in the Gini-coefficient during the 1990s. This is the outcome of several definitional choices, some of which are not fully convincing to us (exclusion of all single adults aged 18 and older who reside with their parents, and exclusion of all realized capital gains.) On the other hand our results are more in line with those reported by Björklund (1998) for persons aged 30–54 and children for the period up to 1995. They are also similar to results reported by Jansson (2000).

Finally, although there is a break in the series, it still seems justifiable to conclude on the basis of the strength of changes that much of the higher inequality the latter year is due to changes in the tails of the distribution. Income of the first decile is 11 percent lower in 1998 than in 1975, while for the highest decile it is 51 percent higher. At the middle of the distribution the changes are surprisingly even. For example income of deciles 3 to 7 all changed by almost 18 percentage points.[9]

We compute Social Welfare using an index defined as:

$$Y(1 - I(I))$$

where Y is equal to average equivalent income and I is an inequality index. Using the Gini-coefficient as the inequality index gives the definition proposed by Sen (1976).

Figure 3 shows how social welfare in Sweden developed from 1975 to 1998 using three different inequality indices. The 1990s appear in this perspective to be even more unfavorable than is indicated by the development of average disposable income alone, as is shown in Figure 1. Figure 3 indicates that social welfare at the end of the period in 1998 is no higher than during the first years of the 1980s. This presents a dismal picture of stagnation in growth of social welfare for almost two decades. Sweden is not unique in this respect, but Sweden's experience differs from that which several other OECD countries have experienced.[10]

In Figures 1, 2 and 3 we have also marked the "color" of the governments along the time axis. Figure 1 shows that both the recession at the beginning of the 1980s and the deep recession at the beginning of the 1990s took place when the liberal–conservative governments were in office. During the first of those periods income inequality decreased; during the second it increased as it did during most years of Social Democratic government. Seen over the two decades it appears

[9]As we have not adjusted for the changes in the definition of income, some part of the change is due to this change.

[10]According to Ruiz-Juerta *et al.* (2000) Australia and Italy have experienced development of Social Welfare similar to Sweden. However, Social Welfare increased in Belgium, Canada, France, (West) Germany, Great Britain, Norway, Spain and the United States. For a comparison of the development of Social Welfare in the United Kingdom and Sweden since 1950, see Stymne and Jackson (2000).

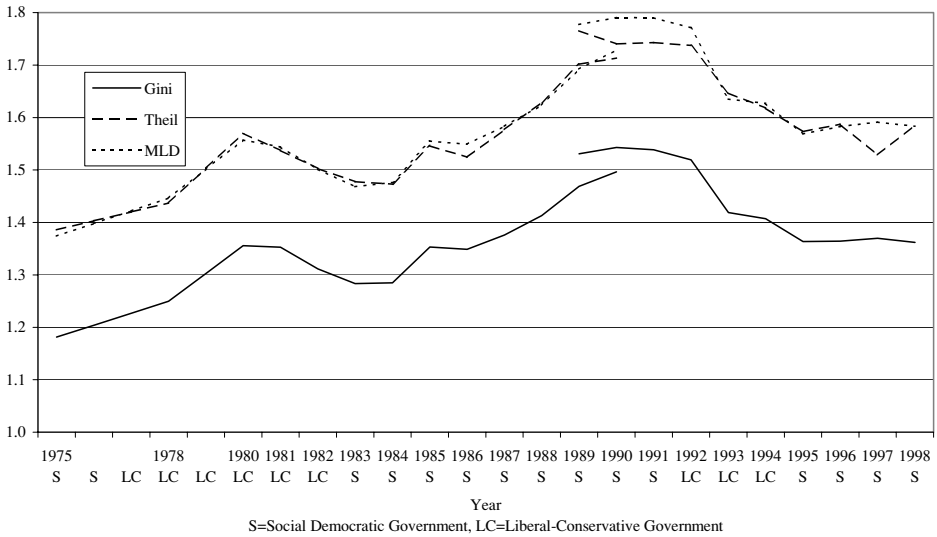


Figure 3. Social Welfare According to Three Inequality Measures. Ratio to the Social Assistance Norm with Housing Costs, 1975–98

that the Social Democratic governments have a better growth record than the liberal–conservative coalitions while the opposite is the case for income inequality.

5. Earnings of Full-time and Full-year Employed

Given the turbulence of the 1990s, in searching for developments in inequality it is reasonable to begin by examining the earnings of persons who have worked full-time and all the year. Women made up 39 percent and men 61 percent of the category of full-time and full-year workers in 1991, compared to 29 and 71 percent in 1975 (an increase of almost 270,000 persons). The proportion of men and women in this group did not change much during the 1990s, but the total number of persons did. In the short time between 1991 and 1993 this category decreased by 13 percent. Although it began to increase again, it was still 4 percent smaller at the end of our observation period in 1998.

Inequality in earnings among full-time and full-year workers is reported in Figure 4. We present the Gini-coefficient, the Theil index and the MLD index. All series are set equal to 100 in 1991. They all indicate that earnings inequality increased slowly during the 1990s. For example the Gini-coefficient went up from 19.5 percent in 1991 to 20.8 percent in 1998. Earnings inequality in 1998 is about the same as in 1975, according to the Gini-coefficient, but has increased considerably according to the MLD and Theil indices.

While the development of the inequality indices computed for equivalent income and earnings among the full-time and full-year employed show similarities, some differences emerge when inspecting how deciles have fared. Table 2 shows changes in earnings using the same periods as in Table 1. The striking

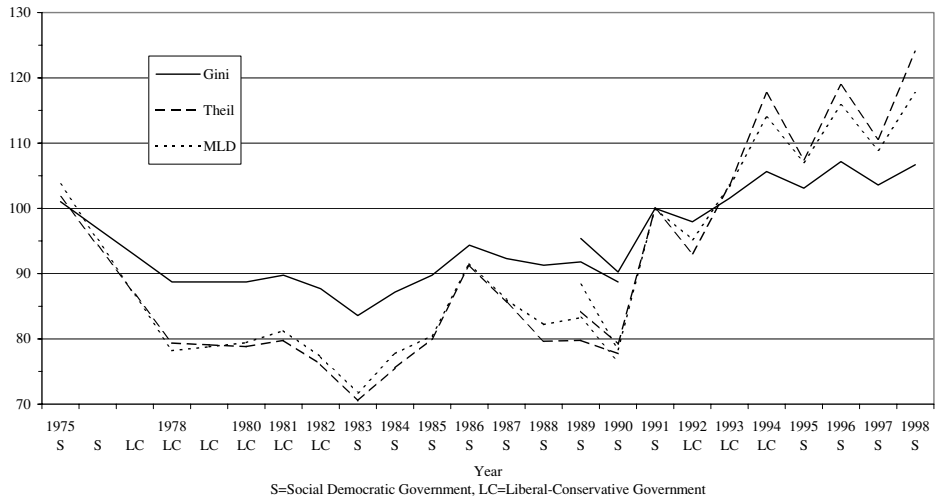


Figure 4. Inequality in Earnings of Full-time and Full-year Workers, 1975–98. Index 1991 = 100

result is that while average equivalent disposable income fell sizably for all deciles between 1991 and 1995, earnings for full-time workers employed the whole year continued to increase in the 9th and 10th deciles. While disposable equivalent income changed very marginally from 1995 to 1998 in all deciles but the 10th, earnings among the full-time and full-year employed increased rapidly. Thus, the immediate result of the recovery in earnings was an increase for "insiders."

Relatively rapidly increasing earnings for a declining number of persons working full-time and all the year and who became fewer in number is thus one part of the picture of increased income inequality in Sweden during the 1990s. In the period 1975–83, which encompasses the previous recession, earnings were affected by increasingly more per decile, with the 9th decile decreasing by over

TABLE 2

Relative Change in Earnings among Full Time and Full Year Employed by Decile

Decile	Change 1975–83	Change 1983–90	Change 1991–98	Change 1991–95	Change 1995–98	Change 1975–98*
1	8.0	25.0	9.2	–2.5	12.0	21.9
2	0.6	12.3	11.7	–1.4	13.2	17.5
3	–3.3	12.8	12.4	–0.7	13.2	15.5
4	–4.5	13.6	12.4	–0.4	12.8	16.0
5	–5.3	14.1	11.8	–0.6	12.5	16.1
6	–5.9	15.9	11.3	–1.0	12.4	16.6
7	–7.0	17.5	10.9	–1.1	12.1	16.6
8	–8.6	19.2	11.4	–0.5	11.9	16.5
9	–10.3	19.1	14.1	0.7	13.4	18.6
10	–15.4	22.3	20.5	2.0	18.1	26.2
All	–7.2	17.6	13.5	–0.2	13.7	18.9

Note: The tax reform of 1990–91 broadened the income tax base; the change affected mainly persons in the higher deciles. For this reason measured income is not fully comparable before and after the reform.

10 percent and the 10th decile by over 15 percent. In the period 1991–98, which encompasses an even deeper recession, earnings of full-time workers increased in all deciles and by most in the 9th and 10th deciles.

We end this section with one additional remark on the content in Table 2. The long-run trend in average earnings for the period studied is hardly impressive. It shows an annual increase of only about 0.6 percent in real terms.

6. Decomposition of the Gini-coefficient by Source of Income

Table 3 examines the importance of various income sources for the years 1975, 1991 and 1998. It shows their size, their relative shares of equivalent disposable income and concentration coefficients, and, based on these numbers, the contribution of each source to total income inequality in a particular year (see Rao (1969), Pyatt, Chan, and Fei (1980) for the methodology).

We begin by commenting on the results for the various components of factor income. The three components of factor income with the largest shares are male earnings, female earnings and capital income.[11] From Table 3 we see that the concentration coefficients for all three components are higher than the Gini-coefficient for disposable equivalent income. The highest concentration coefficient is for capital income, followed by male earnings and then female earnings. In other words, at each point in time, all three components are inequality increasing.

Next we look at transactions *vis-à-vis* the public sector. We distinguish between transfers subject to income tax, other transfers and income taxes. Transfers are also divided into sub-components. Two of the most important are pensions, which is the largest sub-component and unemployment compensation, a component that expanded very rapidly during the 1990s.

The concentration coefficients for the various transfers are all lower than the Gini-coefficient at each point in time. Thus at each point in time they are inequality decreasing. Table 3 also shows that the concentration coefficients vary considerably across the various transfer components. Unemployment benefits, non-taxable transfers and means-tested transfers all have negative concentration coefficients, which means they benefit people at the bottom of the distribution by more than people at the top.

The income source with a profile most directed to the bottom of the distribution is not surprisingly means-tested transfers, i.e. housing allowances and social assistance. Note, however, that the concentration coefficient for unemployment compensation is not very different from zero. This means that in absolute numbers benefits are spread relatively evenly over the income distribution, and that their relative share in total disposable income is smaller at the top of the income distribution than at the bottom. Turning finally to income taxes we find that the concentration coefficient is higher than for disposable income. In other words, people at the top of the distribution pay a larger proportion of their income in taxes compared to those at the bottom of the distribution, which verifies the progressive construction of the Swedish tax-system.

[11]In case there is no male/female in the household, the corresponding income source is set equal to zero for this household. Capital income includes imputed rents from owner occupied housing, interest and dividends, as well as capital gains.

TABLE 3

DECOMPOSITION OF EQUIVALENT DISPOSABLE INCOME (EDI) BY SOURCE: 1975, 1991 AND 1998*

	1975				1991				1998			
	Ratio to Social Assistance Norm with Housing	Percent of EDI	Gini- and Concen-tration-coefficients	Contri-bution to Gini-coefficient	Ratio to Social Assistance Norm with Housing	Percent of EDI	Gini- and Concen-tration-coefficients	Contri-bution to Gini-coefficient	Ratio to Social Assistance Norm with Housing	Percent of EDI	Gini- and Concen-tration-coefficients	Contri-bution to Gini-coefficient
Factor income	1.742	116.2	0.354	0.411	2.015	97.6	0.393	0.383	1.983	105.8	0.422	0.446
Earnings of men	1.162	77.5	0.325	0.252	1.094	53.0	0.390	0.207	1.082	57.7	0.419	0.242
Earnings of women	0.475	31.7	0.439	0.139	0.658	31.9	0.329	0.105	0.672	35.8	0.351	0.126
Capital income	0.105	7.0	0.298	0.021	0.263	12.7	0.562	0.071	0.229	12.2	0.645	0.079
Taxable transfers	0.324	21.6	–0.012	–0.003	0.670	32.5	0.057	0.019	0.677	36.1	0.090	0.032
Pensions	0.226	15.1	–0.106	–0.016	0.442	21.4	0.050	0.011	0.464	24.7	0.155	0.038
Unemployment	0.009	0.6	–0.073	0.000	0.048	2.3	–0.079	–0.002	0.101	5.4	–0.114	–0.006
Others	0.090	6.0	0.229	0.014	0.181	8.8	0.111	0.010	0.112	6.0	0.006	0.000
Untaxed transfers	0.103	6.9	–0.222	–0.015	0.144	7.0	–0.302	–0.021	0.140	7.5	–0.360	–0.027
General	0.062	4.2	–0.137	–0.006	0.102	5.0	–0.217	–0.011	0.094	5.0	–0.260	–0.013
Means tested	0.041	2.7	–0.352	–0.010	0.042	2.0	–0.510	–0.010	0.046	2.5	–0.563	–0.014
Total transfers	0.427	28.5	–0.063	–0.018	0.815	39.4	–0.007	–0.003	0.817	43.6	0.013	0.006
Gross income	2.169	144.8	0.272	0.394	2.830	137.0	0.278	0.381	2.800	149.3	0.303	0.453
Taxes	–0.671	–44.8	0.405	–0.181	–0.764	–37.0	0.363	–0.134	–0.925	–49.3	0.378	–0.187
EDI	1.498	100.0	0.213	0.213	2.065	100.0	0.246	0.246	1.875	100.0	0.266	0.266
Number of persons in Sweden	8,207,643				8,470,122				8,657,296			
Sample size	29,277				21,212				26,335			

*See note to Table 1.

Based on this decomposition we can now ask how different income sources have contributed to the change in the Gini-coefficient. Each component can affect the development through a changed relative share as well as through a changed concentration coefficient. The development of the Gini-coefficient from 1991 to 1998 can be followed between each pair of years. The decomposition gives numbers on concentration coefficients and relative shares for each component each year under study. We organize the information in Figure 5, which shows how the three components of market income have affected the change in the Gini-coefficient for disposable income with 1991 as base year, and Figure 6, which provides the corresponding information for various transfer payments and income taxes.

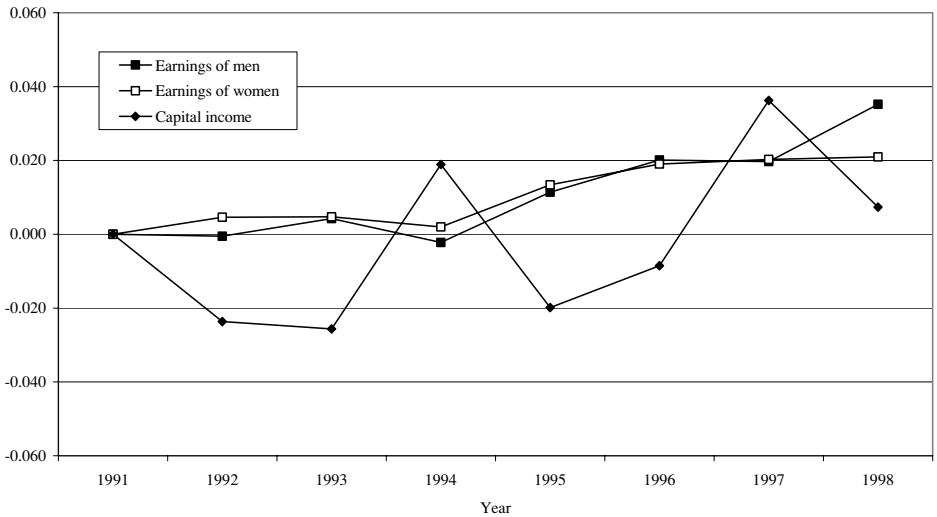


Figure 5. Contributions to Changes in the Gini-coefficient, 1991–98

According to Figure 5, earnings of both men and women pushed the Gini-coefficient for disposable equivalent income upwards and with roughly equal force. The increase is not continuous, but took place from 1994 to 1996 for both genders. There was also an increase for males between 1997 and 1998. This reaffirms the evidence in the preceding section where we saw that when the economy started to recover earnings increased for those employed full-time and all year. Comparing years 1991 and 1998 we find that male earnings as well as female earnings make up larger shares of average disposable income the latter year, and, in addition, we see that their concentration coefficients have both increased.

The development of capital income has also had a considerable effect on the development of the Gini-coefficient for disposable equivalent income during the 1990s. Figure 5 indicates that this is the component that is responsible for the spikes observed in 1994 and 1997 in the time series reported in Table 2. In those years it was not only the average value of capital income that increased rapidly. Its concentration coefficient did too. The data show that this was mainly due to realized capital gains from sales of equities.[12] In 1998, the concentration

[12]One important factor affecting the timing of realized capital gains was changes in the tax legislation.

coefficient for capital income was as high as 0.65, not surprisingly indicating that this income source enhances the status of the better-off.

We now turn to how changes in transfers have affected the development of the Gini-coefficient. Starting with pension payments, we see that their development has contributed to a steady increase in the Gini-coefficient from 1991 to 1995, after which the effect leveled off and actually decreased somewhat. Up to 1995 pensions made up an increasing share of disposable equivalent income, and their concentration coefficient increased rapidly. It went up from 0.05 in 1991 to 0.19 in 1995, but fell back slightly to 0.17 in 1997. In sum, while pension payments still have a profile favoring those at the bottom of the income distribution, the profile is less pronounced than before.

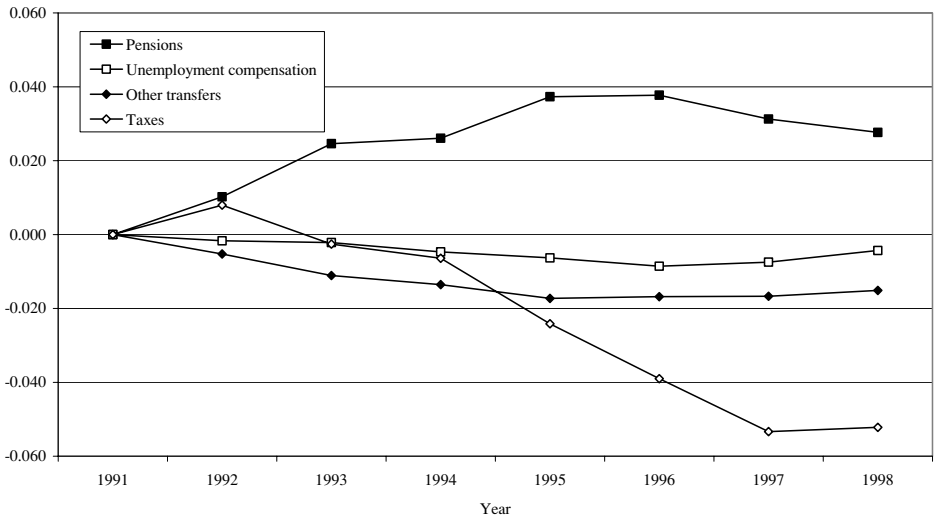


Figure 6. Contributions to Changes in the Gini-coefficient, 1991–98

Figure 6 further shows that unemployment benefits and other transfers counterbalanced factors pushing up the Gini-coefficient for disposable income. Most of the inequality counteracting effect of unemployment compensation was recorded between 1993 and 1996 when its concentration coefficient went from –0.06 to –0.16, whereas other transfers worked in the direction of greater equality throughout the period and were actually more forceful.[13]

Income taxes have had the strongest effect on the Gini-coefficient for disposable equivalent income. As the concentration coefficient fell, there is a very slight tendency for taxes to move the distribution in the more unequal direction 1991 and 1992, following the reform of the system. However, the large effects are from 1994 to 1997 as the relative share of taxes in disposable income increased steadily and income taxes reduced inequality. In 1998, households were paying about 21 percent more in income taxes than in 1991, while disposable income had decreased.

[13]This is also the conclusion of Aaberge *et al*. (2000) who disaggregated the Gini among persons aged 30 to 54 in Sweden in 1989 and 1993 in a comparison with other Nordic countries.

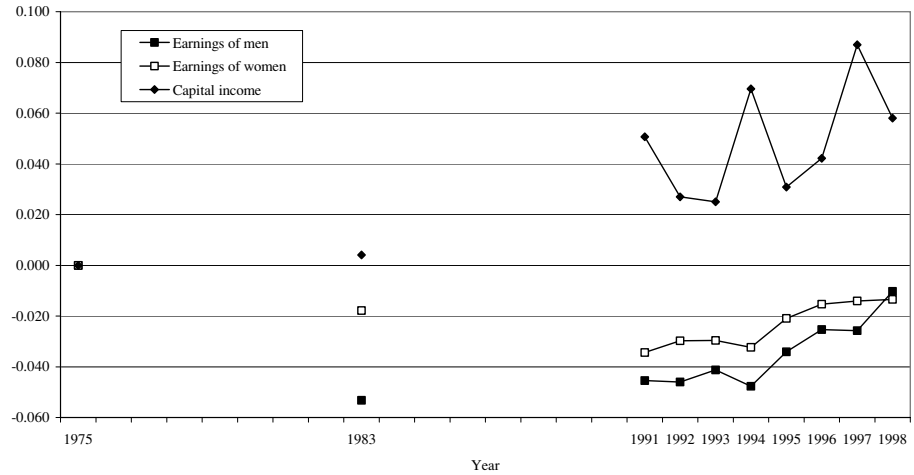


Figure 7. Contributions to Changes in the Gini-coefficient, 1975–98

Up to now we have concentrated on the development during the 1990s. To what extent did forces driving the income distribution during the 1990s play a similar role during earlier years? As it turns out, the roles of separate factors differ greatly before and after 1990. This is not surprising for the period 1975 to 1983, as income inequality fell. But this is also the case for the period from 1983 to 1990, when inequality increased. Figures 7 and 8 report the results (1975 is the base year).

The Gini-coefficient for equivalent income fell from 1975 to 1983, driven by a decrease in the relative share of male earnings, while the concentration coefficient remained almost stable. The relative share continued to decrease from 1983 to

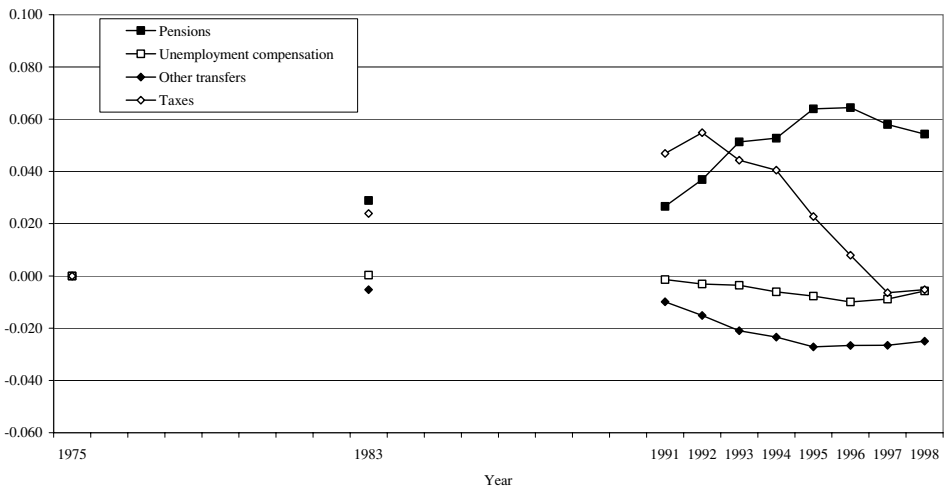


Figure 8. Contributions to Changes in the Gini-coefficient, 1975–98

1991, but this was offset by an increasing concentration coefficient, and the development of male earnings contributed to higher inequality during this period.

The evolution of female earnings worked towards decreasing the Gini-coefficient for disposable equivalent income from 1975 to 1983, but the effect was smaller than that for male earnings. From 1983 to 1991, the participation of women in the labor force continued to increase and female earnings continued to work in the direction of less inequality, due both to increased income shares and a decreased concentration coefficient.

The evolution of capital income was one important force moving the distribution of income in the direction of greater inequality in 1991 than in 1983. However, it is difficult to evaluate this result as capital income is measured better in 1991, as the tax reform increased information on capital income. Figure 7 also enables us to compare 1975 and 1998. We see that although male and female earnings pushed up the Gini-coefficient during the 1990s, this did not fully counteract the trend towards greater equality in the period 1975 to 1983.

Figure 8 shows us that between 1975 and 1983 the development of pensions moved the Gini-coefficient in the direction of greater inequality. The concentration coefficient of pensions changed signs from negative to positive. However, for the period 1983 to 1991 pensions did not affect the evolution of the Gini-coefficient for equivalent disposable income.

A very significant difference between the experience of the 1990s and the preceding two periods is found when looking at how taxes affected inequality (Figure 8). Taxes were an important force in decreasing inequality. Nevertheless, their relative importance weakened both between 1975 and 1983 (when the concentration coefficient fell from 0.41 to 0.35) and between 1983 and 1991 (when the relative share of income taxes fell rapidly). However, taxes played an increasingly important role in reducing inequality in the 1990s.

7. Inequality and the Composition of Population

Inequality in equivalent disposable income can be investigated further by disaggregating the population into sub-groups. By using an additively decomposable inequality index, we can account for changes in the composition of the population and the means for sub-groups. An additively decomposable inequality index is one that can be expressed as a weighted sum of inequality values calculated for population sub-groups plus the contribution from differences between sub-group means. Shorrocks (1980) derives the entire class of indices that are additively decomposable under relatively weak restrictions on the form of the index. He shows that the sub-class of mean independent measures turns out to be a single parameter family. To preserve independence between the intra-group and the inter-group terms, there are only two choices: the Theil index and the mean logarithmic deviation (MLD). The results of both are similar, so we report them using the MLD, which enables comparison with Gustafsson and Palmer (1997), which examines the period 1975–91.

We have broken down the population into a number of different sub-groups, not all of which are reported here. The results when using age of the individual, the household composition and the nationality of the head of the household are

shown in Table 4. The table shows results for the years 1991 and 1998 and can be compared with what we reported for 1975–91 in Gustafsson and Palmer (1997). The table provides information on the population shares, group means and inequality according to the MLD index. Figures in brackets indicate the proportion of total inequality in the relevant year. Table 5 shows how the changes in the various sub-groups influenced aggregate inequality for the period 1991 to 1998, and for the sake of comparison for the earlier period of rising income inequality from 1983 to 1990.

Table 4 shows decreases in real equivalent disposable income from 1991 to 1998 for many sub-groups. However, this was not the case for all age classes. Table 5 shows that the increase in inequality occurred predominantly within, rather than between sub-groups. Increased inequality had almost nothing to do with changing weights of different groups. Instead, this table confirms that the increasing dispersion of incomes within groups is the single most important determinant of the overall increase in inequality for the period 1991 to 1998, as for the period 1983 to 1990.

What are the other main findings? Starting with how average disposable income has changed for various *age groups* we find that average equivalent disposable income of persons 18–24 fell by about 25 percent from 1991 to 1998. Decreased labor force participation together with rapidly increasing unemployment are two important reasons for this development. The deep recession caused many young adults to enter the labor force at a higher age, with a considerably higher proportion becoming involved in formal education or in labor market programs for the unemployed. With recovery, however, the tendency to remain longer in education did not fall back to the earlier levels in the late 1980s. This is consistent with the data, which show that average equivalent disposable income increased from 1995 to 1998 for all age groups *except* for persons aged 18–24.

In the recessionary period 1991–95, average equivalent disposable income fell for all age groups except the very oldest age (75 and older), although average income for persons 65 to 74 decreased only slightly. In other words, old-age pensioners were more or less insulated from the overall effects of the recession and did not experience a fall in their real average disposable income during the 1990s.

According to Table 5 the development of average equivalent disposable income for people of various ages explains slightly less than one fourth of the increase in inequality between 1991 and 1998. A similar conclusion can be drawn for the increase between 1983 and 1990. Instead, most of the increase in inequality since the beginning of the 1980s is within age categories, and Table 4 shows this is the case for almost all age groups for the period 1991 to 1998.

The long-run change towards a later entrance into work life is one—very important—reason why average equivalent disposable income of people aged 18–24 has developed very weakly since 1975. Figure 9 shows that while all other age categories have higher average equivalent disposable incomes in 1998 than in 1975, the opposite is the case for persons aged 18–24. Looking at the other end of the age spectrum the development is entirely different. In 1998 people over 55 enjoy an average equivalent disposable almost 50 percent higher than their

TABLE 4

CROSS-SECTIONAL DECOMPOSITION OF INEQUALITY IN EQUIVALENT DISPOSABLE INCOME

Characteristic	Population Share, %		Group Mean Income		MLD	
	1991	1998	1991	1998	1991	1998
Age of person						
0–7 years	10.30	9.63	1.751	1.642	0.0573	0.0875
					(4.8)	(5.7)
8–17 years	12.18	12.56	1.966	1.708	0.0906	0.0805
					(8.9)	(6.8)
18–24 years	9.00	8.86	1.393	1.037	0.2303	0.3153
					(16.7)	(18.9)
25–34 years	13.72	13.66	1.991	1.775	0.0876	0.1150
					(9.7)	(10.6)
35–44 years	13.99	13.29	2.160	1.868	0.1044	0.1049
					(11.8)	(9.4)
45–54 years	13.40	14.02	2.683	2.370	0.1199	0.1334
					(13.0)	(12.6)
55–64 years	9.61	10.85	2.603	2.506	0.1216	0.1179
					(9.4)	(8.6)
65–74 years	9.78	8.49	1.965	1.957	0.0770	0.0906
					(6.1)	(5.2)
Over 74 years	7.98	8.64	1.503	1.564	0.0603	0.0905
					(3.9)	(5.3)
Within-groups component of inequality					0.1044	0.1231
					(84.3)	(83.2)
Between-groups component of inequality					0.0193	0.0250
					(15.6)	(16.9)
Household composition						
Over 64 years	18.14	17.32	1.768	1.760	0.0856	0.0971
					(12.5)	(11.4)
Couples, no children	17.53	17.66	2.856	2.657	0.0914	0.0996
					(12.9)	(11.9)
1–2 children	27.77	26.25	2.167	1.938	0.0792	0.0891
					(17.8)	(15.8)
3+ children	10.36	10.70	1.620	1.506	0.0504	0.0715
					(4.2)	(5.2)
Single parents	6.70	6.79	1.490	1.327	0.0599	0.0411
					(3.2)	(1.9)
Without children	19.48	21.30	1.807	1.534	0.2086	0.2696
					(32.8)	(38.8)
Within-groups component of inequality					0.1034	0.1254
					(83.5)	(84.7)
Between-groups component of inequality					0.0203	0.0226
					(16.4)	(15.3)
Citizenship						
Swedish	95.28	95.11	2.062	1.883	0.1207	0.1450
					(92.9)	(93.2)
Foreign	4.71	4.89	1.669	1.438	0.1659	0.1746
					(6.3)	(5.8)
Within-groups component of inequality					0.1228	0.1465
					(99.2)	(99.0)
Between-groups component of inequality					0.0009	0.0016
					(0.7)	(1.1)
Sweden	100.0	100.0	2.043	1.861	0.1238	0.1480

Note: Numbers in brackets in the last two columns show percentages of total inequality for the year in question.

TABLE 5

DECOMPOSITION OF CHANGE IN AGGREGATE INEQUALITY IN EQUIVALENT DISPOSABLE INCOME BETWEEN 1991 AND 1998

Characteristic	1	2	3	4
Age of person	0.0184	0.0004	0.0011	0.0057
	(72.1)	(1.4)	(4.1)	(22.4)
Household composition	0.0195	0.0027	0.0008	0.0026
	(76.1)	(10.5)	(3.1)	(10.3)
Citizenship of household head	0.0235	0.0001	0.0001	0.0014
	(93.5)	(0.3)	(0.6)	(5.6)

1. Change due to changes in within-groups component of inequality.
2. Change due to the effect of changes in population shares on the within-groups component of inequality.
3. Change due to the effect of changes in population shares on relative mean income.
4. Change due to changes in relative mean income.

counterparts in 1975. Almost all of this improvement had taken place by 1991, however.

Let us now turn to *household composition*, where we distinguish between families whose household head is over 64 years, non-aged couples without children, couples with one or two children, couples with three and more children, single parents, and finally single under-age-65 adults without children. Table 4 reconfirms the previous finding that the average disposable income of old-age pensioners did not fall between 1991 and 1998, while it fell for all other categories with the drop among couples without children being the smallest. According to Table 5, the different development of average equivalent disposable income in various types of household accounts for one tenth of the increase in total inequality between 1991 and 1998, which is smaller than in 1983 to 1990. Income inequality within the category single under-aged-65 persons without children is

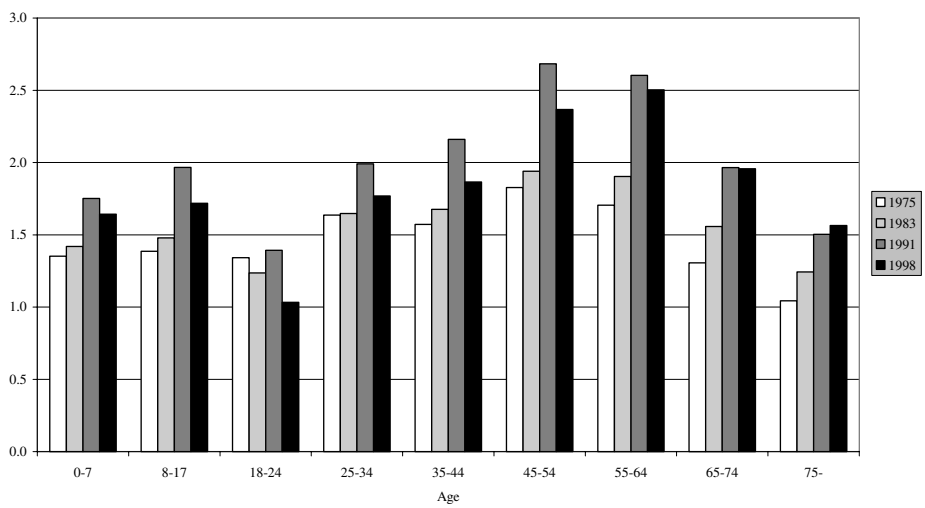


Figure 9. Mean Equivalent Disposable Income by Age. Ratio to the Social Assistance Norm with Housing Costs, 1975, 1983, 1991 and 1998

particularly large, while the opposite is the case among persons living in single parent families. Whereas income inequality increased in almost all types of households, this was not the case for persons in single parent families.

During the period 1991–98 average equivalent disposable income for single parents dropped by 11 percent, which is slightly more than for couples with children. From the data it can be seen that average disposable income of single parents in 1997 is 3 percent lower than for their counterparts in 1975. During the same period average disposable earnings of couples with one or two children increased by 30 percent and for couples with three or more children by 26 percent. Thus there is a long-run trend towards an increased gap in average income between persons in single parent households and persons in other families with children. There is also a long-run increase in the proportion of all children living in single parent families. While the ratio between persons living in single parent families to those living among couples with children was 1 to 6.9 in 1975 it had changed to 1 to 3.9 in 1997. Understandably the economic situation of single parent families in Sweden has recently attracted the attention of persons concerned with family policy.

While the average disposable equivalent income of persons born in Sweden fell by 9 percent from 1991 to 1998, among persons in households headed by a foreign adult it dropped by 14 percent. In other words, the gap in average equivalent disposable income between foreigners and native-born Swedes increased during the 1990s, a continuation of a trend that began in the 1970s. In 1978 (the first year we can identify citizenship in our data set) the income gap was 6.2 percent; it had increased to 19.1 percent in 1991 and then further to 23.6 percent in 1998. This may give cause for concern in itself and presents a challenge for policy makers who are presently worried about the decline in the labor force coming in the next decade, and the need to attract foreign workers to fill the labor–supply gap. Nevertheless, people living in households with a foreign head constitute a small proportion of the entire population. This is why the changes in average disposable equivalent income between foreigners and natives can only explain a tiny 2 percent of the increase of total inequality in disposable equivalent income from 1991 to 1998.

8. Conclusions

This paper has examined what happened during the 1990s in Sweden with the onset of a deep recession and a rapid increase in the unemployment rate, a fall in GDP and a deeper fall in average disposable income, followed by years with renewed expansion. This was a period marked by a strong increase in stock market prices, following the general international trend. In addition, the pension system matured, which meant that an increasing number of persons retired with a better pension.

The analysis shows that inequality continued to increase in the 1990s. Decomposing total inequality by population groups and studying the earnings of full-time workers showed that while many groups experienced drops in income during the 1990s, some did not. "Insiders" were the old-age pensioners and full-time workers whose average income did not decrease. However, full-time workers

shrank in number during the first half of the 1990s. As the economy started to recover in the mid-1990s they received increases in real earnings. The ''outsiders'' were those who found it increasingly difficult to enter employment. Young adults, recent immigrants and single-parent families shouldered much of the burden of the deep recession.

In some respects, developments in the 1990s reinforced the development from the beginning of the 1980s. Age became more decisive for equivalent income. However, the results from decomposing the Gini-coefficient by income source indicate that forces leading to increased inequality during the 1990s differed from those at play during the 1980s. Capital income was responsible for the uneven increases during the 1990s. This force was joined by pensions, which pushed inequality in equivalent income up during the first part of the 1990s, as did earnings of both men and women—especially full-time workers—once the economy started its path towards recovery in the middle of the 1990s.

Whereas pension payments led to greater inequality, other transfer payments had the opposite effect. Unemployment benefits had inequality reducing effects, although they were perhaps not as large as could have been expected. Targeted means-tested benefits were much more effective in reducing inequality. The analysis shows that the single most important factor counterbalancing the rise in income inequality was income taxes. This effect came about along with the increase in earnings after the mid-1990s, and by the end of our observation period in 1998 households paid a larger (real) proportion of their income in taxes than at the beginning of the decade.

Finally, the fall in average income brought about by the deep recession in combination with increased income inequality meant that Social Welfare in Sweden in the second part of the 1990s was not very different from that in the beginning of the 1980s. Seen over the two decades it appears that the Social Democratic governments have a better growth record than the liberal–conservative coalitions, which have a better record in the case of income inequality.

Appendix

The analysis in Section 6 of the importance of the various income sources was made by decomposing the Gini-coefficient for equivalent disposable income. This can be written as the weighted sum of concentration-coefficients for the various income sources, and the weights are the relative shares of income sources in equivalent disposable income, which thus add up to 1.

$$G = \sum_k \frac{\mu_k}{\mu} C_k, \tag{1}$$

where μ_k and μ are the means of income source k and equivalent disposable income y, and C_k is the concentration coefficient of income source k. The concentration coefficient measures the association between income source k and equivalent disposable income. It can assume values ranging from –1 to +1. If the concentration coefficient of an income source is greater (or smaller) than the Gini-coefficient of equivalent disposable income, this income source would be regarded

as being deequalizing (or equalizing). When the income source has a concentration coefficient which is equal to the value of the Gini-coefficient of equivalent disposable income, it implies that the distribution of the income source is as equal as the disposable income.

The relative contribution of income source k to inequality of total income can be expressed as

$$E = \frac{u_k c_j}{G}, \tag{2}$$

where u_k is share of income source k in equivalent disposable income; c_k the concentration coefficient of income source k; G the Gini-coefficient of equivalent disposable income. Moreover the difference of the Gini-coefficient between two years, 1, 0, can be written as

$$G_1 - G_0 = \sum_k (u_{1k} c_{1k} - u_{0k} c_{0k}) \tag{3}$$

where u_{ik} is the share of income source k in equivalent disposable income at i-th year; c_{ik} is the concentration coefficient of the income source k in i-th year; G_i is the Gini-coefficient of equivalent disposable income in i-th year.

The analysis in Section 7 of the importance of changes in mean income for various income groups was made by decomposing the MLD index which is defined as:

$$MLD\,(y; N) = \frac{\sum_i \log(\mu / y_i)}{N},$$

where N is the number of observations, y_i individual income and μ mean income of all observations. The MLD index has the attractive property of being additively decomposable. This means that total inequality is the weighted sum of within group inequality and a between group component using population shares as weights. The latter term expresses how much inequality would exist if there were no inequality within each category, with the mean income for each component kept constant.

Changes in the MLD between two periods, t and $t+k$, can be written as:

$$\begin{aligned} \Delta L &= L_{t+k} - L_t \\ &= \sum_k \bar{v}_k \Delta L_k + \sum_k \bar{L}_k \Delta v_k - \sum_k (\overline{\ln \lambda_k}) \Delta v_k - \sum_k \bar{v}_k \Delta \ln \lambda_k \\ &\approx \sum_k \bar{v}_k \Delta L_k + \sum_k \bar{L}_k \Delta v_k - \sum_k (\bar{\lambda}_k - \overline{\ln \lambda_k}) \Delta v_k + \sum_k (\bar{\theta}_k - \bar{v}_k) \Delta \ln \mu_k, \end{aligned} \tag{4}$$

(a) (b) (c) (d)

where μ_k is the mean value of group k, $\lambda_k = \mu_k / \mu$, v_k is the share of group observations in total, and $\theta_k = v_k \cdot \lambda_k$. Δ represents the change in the relevant variable from period t to period $t+k$. A bar over a variable represents an average for the two period values. The approximation is more useful than the exact decomposition as it relates inequality changes to changes in sub-group inequalities, shares and means. The four terms in equation (4) can be interpreted as: (a) the

effect of intertemporal changes in inequality within groups; (b) the effect of changes in population shares on the within-groups' component of inequality; (c) the effect of changes in population shares on the relative mean income of the population groups; and (d) the relative mean income of the population groups. The overall effect of demographic changes is given by the sum of the second and third terms.

TABLE A1

Inequality-Indices in Sweden, 1975–98 (Standard Deviation for Gini-Coefficient in Parentheses)

	Gini-coefficient	Theil's Index	MLD	P90/P10
1975	0.213	0.077	0.085	2.52
	(0.004)			
1976				
1977				
1978	0.200	0.080	0.074	2.39
	(0.007)			
1979				
1980	0.194	0.067	0.074	2.35
	(0.005)			
1981	0.191	0.081	0.077	2.29
	(0.005)			
1982	0.194	0.076	0.077	2.31
	(0.006)			
1983	0.194	0.072	0.078	2.34
	(0.006)			
1984	0.204	0.087	0.086	2.39
	(0.006)			
1985	0.205	0.092	0.087	2.39
	(0.008)			
1986	0.214	0.112	0.097	2.41
	(0.011)			
1987	0.205	0.089	0.085	2.38
	(0.007)			
1988	0.204	0.082	0.085	2.41
	(0.005)			
1989	0.210	0.085	0.090	2.42
	(0.005)			
1990	0.219	0.106	0.098	2.50
	(0.006)			
1991	0.247	0.147	0.124	2.69
	(0.011)			
1992	0.238	0.129	0.112	2.66
	(0.007)			
1993	0.240	0.118	0.124	2.71
	(0.005)			
1994	0.269	0.160	0.155	2.81
	(0.006)			
1995	0.243	0.127	0.129	2.18
	(0.005)			
1996	0.253	0.131	0.133	2.83
	(0.004)			
1997	0.278	0.194	0.161	2.17
	(0.009)			
1998	0.267	0.147	0.148	2.95
	(0.005)			

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