SWEDISH ECONOMIC POLICY REVIEW 5 (1998) 39-80

Income distribution in Sweden: what is the achievement of the welfare state?

Anders Björklund*

Summary

■ By tradition, most studies of income distribution have focused on cross-sectional inequality of annual disposable income. The paper starts by summarizing conclusions that can be drawn from such studies. Even in the midst of the deep recession in 1992, Sweden had retained its position among the four or five OECD countries with the highest degree of equality. The paper continues by reviewing two rapidly growing fields of literature on long-run equality and on equality of opportunity as measured by intergenerational income correlations. The conclusions about successful outcomes regarding equity are not changed when these perhaps more basic dimensions of equality are used. ■

* *Professor of Economics at the Swedish Institute of Social Research at Stockholm University and a member of the Swedish Economic Council. His main fields of research are labor economics, income distribution, and economics of the family.*

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Income distribution in Sweden: what is the achievement of the welfare state?

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There is no doubt that the major goal of the traditional Swedish welfare state has been to equalize economic outcomes among the residents of the country. Income taxes have been high and progressive. A variety of transfer systems have been introduced to help families with low incomes. This is not to say that each public transfer system has been designed to maximize its immediate equalizing impact on income distribution. A typical feature of Swedish social insurances has been to rely on the principle of income replacement. This is basically the design of unemployment insurance, sickness benefits, maternity leave, and pension systems. Further, support to families with children has been quite general in nature rather than means tested. Child allowances, for example, are universal and paid to all parents irrespective of their income and wealth.

It is often argued that the principles of income replacement and universality are parts of an ambitious overall strategy to achieve a high level of equality. Public social insurance, based on the income-replacement principle, might *crowd out* private insurance schemes with less egalitarian outcomes as a consequence. And universality of the systems might increase their political support among the middle class and even among those in the upper part of the income distribution.[1]

Yet another characteristic of the Swedish approach to welfare-state policy is the strong emphasis on universal access to public services, such as education, health-care services, and care of the elderly. A popular expression among proponents of this approach is that the

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[1] Korpi and Palme (1998), for example, have forcefully advanced these arguments.

size of the wallet should not affect availability of such fundamental services. For example, regarding education, this view can be interpreted as preferences for equality of opportunity: *the size of the parents' wallets should not affect the educational choices of children.*

The ambition to equalize pre-tax and transfer outcomes in the labor market also illustrates the emphasis on equality in Sweden. Swedish unions have been strong and have tried to reduce wage differentials. In practice, the *solidarity wage policy* has been a policy to reduce wage differentials. A motivation for public labor market policies has been to support this wage policy of the unions.[2] In all, the Swedish people have revealed preferences in favor of equality in several dimensions.

In the 1990s, the Swedish welfare state has been challenged in several ways, the most important one being the big budget deficits. With the high overall tax rates, it is not surprising that expenditure cuts have been the main candidates for measures to reduce the deficit. Another threat to the equality achieved in Sweden has been the high unemployment rate, which seems to have become permanent. European integration and more intense international competition are also regarded as (future) threats to the equal labor market outcomes in Sweden.

In this economic environment, it is inevitable that participants in the public discussion argue that the very ambitious goals of equality must be reexamined. It is also argued that there are some more *basic* dimensions of equality that are more important to protect and some less important ones. A common claim is that public services are more important than public transfers to achieve the basic goal of equal opportunity. Another common claim has been that the most important goal is *lifetime equality*, whereas the ambitions to equalize individuals' incomes over the life cycle could be reduced.

No matter what is true about these future challenges of the welfare state, it is important to identify the:

- Goals of equality that the Swedish welfare state achieved up to around 1990
- Extent of the setbacks that have occurred during the 1990s

The purpose of this paper is to address these two issues.

[2] See Edin and Holmlund (1995) for an overview of solidarity wage policy and labor market policy.

In looking for empirical evidence to evaluate the extent to which the Swedish experiment has been successful in equalizing economic outcomes, the most detailed information pertains to income measured over a single year. Like the statistical offices in many other countries, Statistics Sweden runs an *Income Distribution Survey*, which focuses on the distribution of annual income. Thanks to the work of Statistics Sweden, the quality of these data has improved over time. The data are also quite rich in the sense that they provide information about several income concepts. At the international level, the *Luxembourg Income Study* (LIS) has collected national income-distribution surveys from many countries into one multi-national research database.[3] Statistics Sweden's *Income Distribution Survey* is the Swedish data contribution to LIS. The LIS organization has also made large efforts to improve comparability among countries. For these reasons, there is now growing literature on cross-country comparisons of inequality of annual income. In these comparisons, Sweden has, in general, come out as a country with one of the most equal distributions of annual disposable income.

But, the focus on income received in a single year has been criticized as a too narrow measure to determine how successful a country has been in achieving economic equality and justice. The most obvious limitation is probably that a year is a short period. Annual income can be thought of as containing at least three components:

1. A lifetime or *permanent* component.
2. A component that represents the phase of the life cycle that the individual is in at the moment—a student, newly married (or cohabiting) without children, raising children, living with a working spouse without children living home, and being retired.
3. A transitory component, which captures the fact that the individual in all phases of life is exposed to shocks such as sickness, unemployment, and simply bad or good luck. Transitory income variation can also appear by voluntary choice if, for example, a person works very hard for a couple of years to save money for a later period of leave of absence to travel around the world.

By using annual data, the researcher attaches equal weights to all income differentials irrespective of the nature of the income differentials. Another obvious limitation of data on inequality of economic

[3] See Atkinson, Rainwater and Smeeding (1995) for detailed information.

outcomes, annual or lifetime, is that they in themselves cannot be interpreted regarding inequality of opportunity.

I continue the paper by summarizing evidence from traditional annual data on disposable income. Section 1 discusses data and measurement issues. In Section 2, I show the evolution of Swedish income distribution using annual data from 1975 to 1995. Section 3 presents the Swedish record from a cross-national perspective, mainly using results from studies based on LIS. Section 4 examines whether the conclusion that Sweden has a successful outcome regarding equality is changed if broader measures of income are used and if equality of opportunity is used as the criterion of success. Most of Section 4 is devoted to studies that use data from time units longer than one year. Section 5 summarizes evidence from rapidly expanding literature on intergenerational earnings mobility as measured by correlations between earnings of fathers and sons. Section 6 concludes the paper.

1. Issues of measurement and methodology

1.1. Measurement

A common starting point for income measurement over a certain period is the Haig-Simons definition of income. According to this definition, income is defined as the maximum consumption a person can afford in the period without ending the period with lower net wealth than at the start, that is, without reducing future consumption possibilities. This also means that income is actual consumption in the period plus the change (positive or negative) in net wealth during the period. Because income is defined in terms of potential consumption, it is obvious that both cash and non-cash components of income ideally should be included.

Even though the Haig-Simons definition offers some general guidelines for measuring income, several practical problems appear in empirical work. I follow what today is the most frequent approach to measuring disposable income in applied income distribution research. Income is measured with the household as the *unit of income*, which means that post-tax and transfer income of all persons in the household are included. This measure of total household income is divided by the *equivalent number of adults in the family*, using an equivalence scale. For example, the income per person, obtained in this way, is distrib-

uted equally among all members of the household, an assumption about *equal sharing* within the household. This assumption implies that inequality between men and women is ignored in this kind of analysis. Gender inequality obviously requires another analysis. In the final step, inequality is measured among all individuals in the total sample; so the individual is the *unit of analysis*. A nice property of this procedure is that a measure of the economic standard of children is also obtained, so inequality among children can also be measured.

The choice of equivalence scale in this procedure is crucial. The applied scales generally have two properties. First, children are generally considered a *financial burden* for the adults in the household, even though this assumption is not necessary to make. Second, most scales imply some economies of scale within the household, so the marginal cost of additional adults (and additional children) falls with the number of adults (or children) in the household.

When these general principles are applied on data from Statistics Sweden's *Income Distribution Survey*, some weaknesses of the approach should be kept in mind. First, the survey applies a rather narrow definition of the household. Only two spouses are considered adults in a particular household, even if more adults live in the same household. Additional household members are counted as separate households. For example, all adult children, age 18 and older, who live with their parents and *grandparents*, who in some cases live in the same household, are counted as separate households.[4] Second, capital income is quite poorly measured. Capital gains are included only when they are realized and to the extent that the gains are considered income in tax assessments. Further, if no special correction is made, all capital income is measured in nominal terms. Third, there are no attempts to include consumption of various free public services in income, even though some such services are close substitutes to cash income. Fourth, almost all income data stem from employers' reports to tax authorities. Obviously, such a measure of reported income does not capture income from the hidden sector of the economy.[5]

[4] Households with members from three generations of a family are rare. According to the *Level of Living Survey* of 1991, less than one-half of one percent of residents in Sweden, ages 18-75, lived in such households.

[5] The issue about the discrepancy between reported and real income due to tax evasion seems to be neglected in the empirical literature. Persson and Wissén (1984) analyze this problem by means of a theoretical model and can characterize the conditions under which the two distributions differ from each other in various ways.

Finally, the *Income Distribution Survey* is a sample of about 10,000 households, so standard errors of inequality measures might be of non-trivial size, especially for subgroups of the population.

1.2. Methods

To find out how the welfare state by means of taxes and transfers has affected the income distribution, I need a counterfactual that describes what income distribution would have been without these policies. In this paper, I follow a long tradition that simply compares the actual distribution of disposable income with the distribution of pre-tax and transfer income. Although this procedure might yield a reasonable approximation to the relevant counterfactual, it is important to stress two limitations of it. First, one must ignore economic behavior, such as labor supply and savings, which taxes and transfers might affect. The same holds for prices and wages that are assumed to be unaffected by welfare state policies. A very elaborate behavioral model of the economy would be needed to take such effects into account.[6] In my opinion, there is no such model available in the literature. Second, it might be unrealistic to assume that the counterfactual to the welfare state does not contain the protection that some of the public social insurance systems offer. In particular, it is reasonable to assume that private pension systems would grow in importance without a public one. Also, the private market, without public support, would probably offer some private sickness-benefit systems and even unemployment benefit schemes.

Fully aware of these problems and without access to the required behavioral models, I confine myself to analyzing the impact of taxes and non-taxable transfers. The most important of the latter are child and housing allowances, social assistance benefits, and advance maintenance for single parents. Even though both income taxes and such transfers might affect economic behavior, a private market would not offer the transfers in the absence of a public welfare state.[7]

[6] Because disposable income is measured with the family as the unit of income and the family size is adjusted for by equivalence scales (see Section 1.1), not only economic models of labor supply behavior and price determination are needed, but also demographic models of mating, fertility, and divorce.

[7] Maybe there would be more, and more active, charity organizations without such public transfers.

2. The evolution of inequality of annual income

2.1. 1975-1995—the *Income Distribution Survey*

The *Income Distribution Survey* offers time-series information on income distribution from 1975-1995 (with comparable data missing for 1976-77 and 1979).[8] Figures 1a and 1b show the evolution of inequality over this period for three groups, namely: all persons (including children), prime-age adults, ages 30-54, and children, ages 0-17. From a general viewpoint, it is appealing to study income inequality among all individuals in society. But because of the weakness of the household concept in the *Income Distribution Survey* and the fact that it is commonly accepted that high school[9] and college students can live relatively well on low incomes, I also use an age group that excludes most students. For example, in looking at ages 30-54, I eliminate most students and focus on a group that the labor market strongly affects. Children are interesting in their own right. The economic standard of children is not, in any respect, voluntarily chosen by the child, and equality of economic standard among children might reflect equality of opportunity. The equivalence scale that I use is commonly used in Swedish studies and is based on official guidelines about social assistance for families of different sizes. In this scale, the first adult gets the weight 1.0; the second adult, 0.65; a child age 0-3, 0.35; a child age 4-10, 0.43; and a child age 11-17, 0.52.

Figure 1a shows two commonly used measures of overall inequality, the Gini coefficient and the 90/10 percentile ratio. The general conclusions drawn are not sensitive to this choice of measures of inequality and equivalence scale.[10] Figure 1b contains the 90/50 and 10/50 percentile ratios and consequently provides information about the inequality within the lower part (10/50) and within the upper part (90/50) of the distribution. Note that a high value of the 10/50 percentile ratio implies a high degree of equality, whereas a high value of the 90/50 percentile ratio implies the opposite.

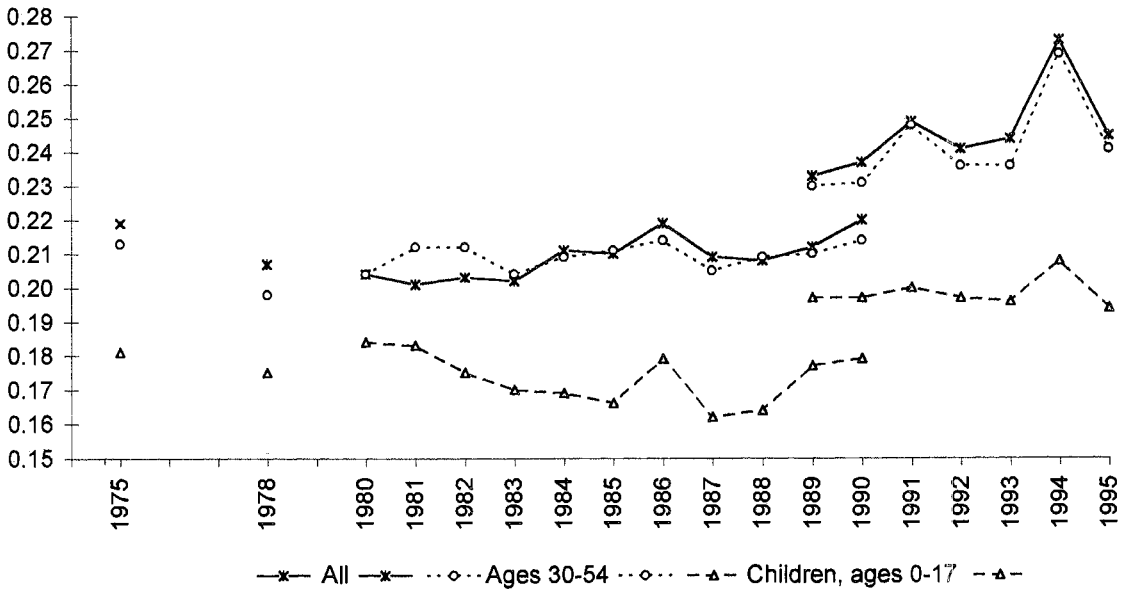
[8] Gustafsson and Palmer (1997) and Ministry of Finance (1996, 1997) offer alternative recent presentations of the evolution of Swedish income distribution using the same basic data set. Contrary to Statistics Sweden, Gustafsson and Palmer add 2.5 percent of the net asset value of an owner-occupied home to income.

[9] The normal graduation age from high school is 19 years in Sweden.

[10] Figures that use alternative measures of inequality and an alternative equivalence scale are available from the author upon request.

Figure 1a. Inequality of disposable income 1975, 1978, 1980-1995 among all persons, ages 30-54, and among children

a) Gini coefficient



Source: Statistics Sweden's *Income Distribution Survey*

Figure 1a. Continued ...

b) P90/P10

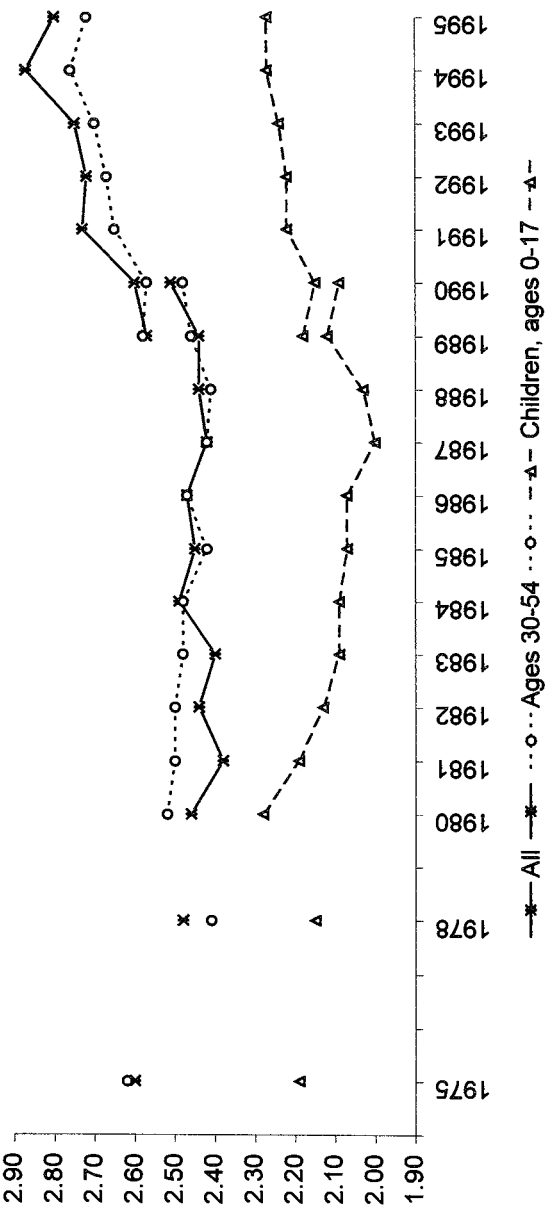
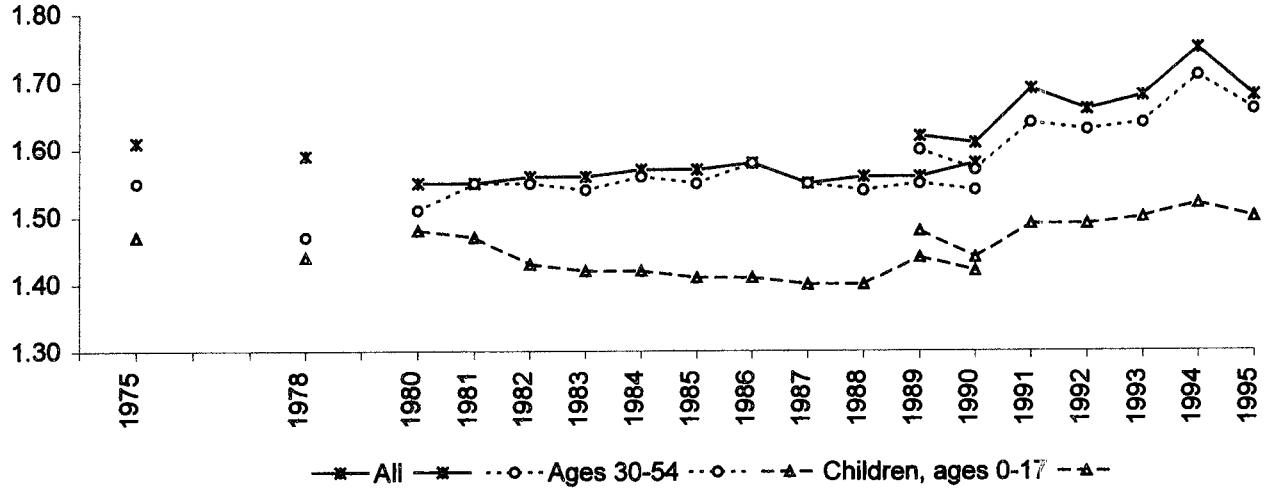


Figure 1b. Inequality of disposable income 1975, 1978, 1980-1995 among all persons, ages 30-54, and among children; 90/50 and 10/50 percentile ratios

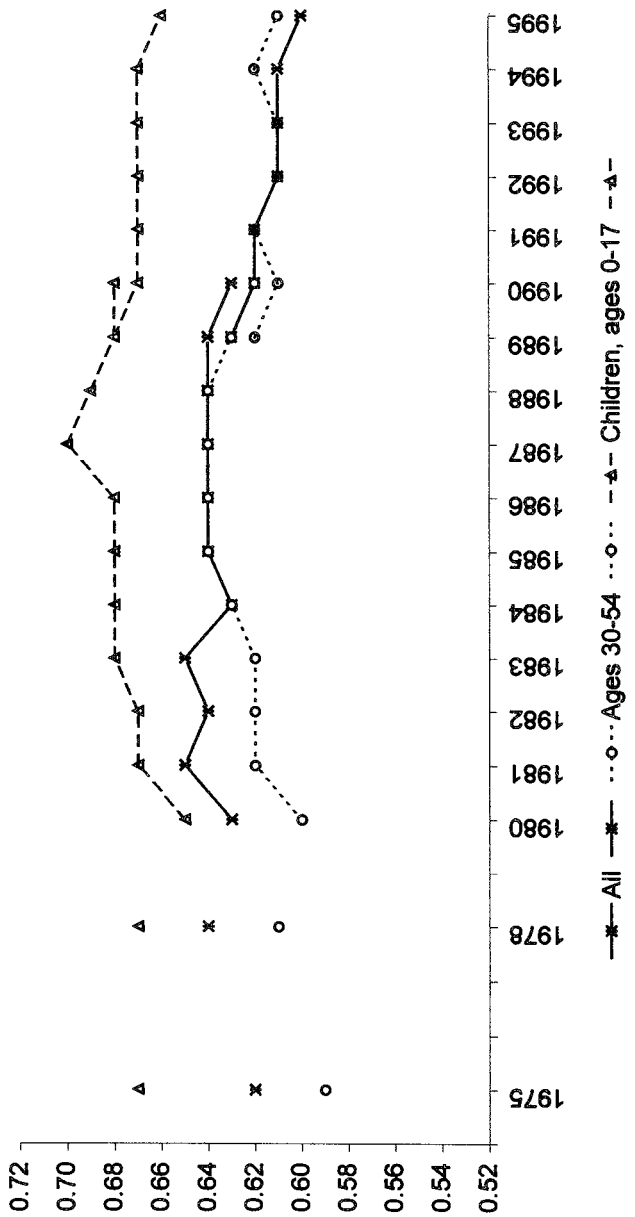
a) P90/P50



Source: Statistics Sweden's *Income Distribution Survey*

Figure 1b. Continued ...

b) P10/P50



It is natural to start by looking at the 1975-1990 period, and then to turn to the turbulent 1990s. Stability is the most striking pattern in the evolution of inequality in this period. For all three groups, the Gini coefficient fluctuates within two percentage points. For the entire population, the range in the period is 0.20-0.22. The 90/10 percentile ratio fluctuated between 2.40-2.60 for the entire population. The fluctuations for the more homogenous group (ages 30-54) are slightly lower. But for children, there is an equalizing trend until 1987, after which it is reversed. These fluctuations are modest and motivate *stability* as the label for this period, considering standard errors of Gini coefficients on Swedish data, which are around 0.004 and considering the magnitude of cross-country differences in Gini coefficients and 90/10 ratios, which are reported below.[11] From the methodological viewpoint, it is interesting to note that the 1986 spike in the Gini coefficient does not show up in the 90/10 ratio. The reason is most likely that there are a few observations with very high income in the very top of the 1986 distribution.

There is no obvious peak in equality in the period. For the entire group, 1981 is the peak according to both measures of inequality, whereas the peak for prime age and for children came later in the 1980s.

Figure 1b can tell whether the apparent stability of income inequality over the period reflects stability in both the upper and the lower part of the distribution, or if there were counteracting forces involved. The answer seems to be that inequality has been quite stable in both parts of the distribution.

The 1990s have been turbulent in several ways from the income-distribution viewpoint. The recession with very high unemployment started in 1991, and since then unemployment rates have been very high by historical Swedish standards. Partly as a consequence of rising unemployment rates and partly due to educational reforms, the school enrollment rates among ages 18-25 increased quickly over the 1990s. A large tax reform, with lower marginal tax rates, broader bases of taxation and higher transfers to families with children, was implemented in 1991. In the next years, budget cuts with lower replacement rates in most social insurance schemes and reduced uni-

[11] It is not easy to say what is *much* and what is *little* in characterizing changes and differences in inequality. The reader can use the property that the Gini coefficient equals half the expected percentage difference between two randomly drawn individuals in the population that is studied.

versal child allowances were made effective. Further, the rate of inflation fell markedly with lower discrepancy between real and nominal capital income as a consequence.

The economy changed in several ways and so did the data that are used to analyze income distribution. First, the broadening of the tax base in 1991 changed the income concepts in several ways. Second, due to changes in the incentives to sell stock, realized capital gains were unusually high in 1991 and 1994. And finally, as previously mentioned, inflation fell markedly with consequences for the content of capital income.

To avoid the first of these problems, I use revisions of income data for 1989 and 1990, made by Statistics Sweden, to achieve comparability over time. As shown in Figure 1a, the Gini of these revised income data is about one percentage point higher for 1989 and 1990, so the income definition seems to have raised the Gini coefficient by this magnitude. But some caution is called for, because it was not an easy task to determine how much the broadening of the tax bases affected measures of income.[12] Regarding the second problem, I see no other way to solve it than to treat the observations for 1991 and 1994 as outliers due to temporarily high capital gains in these years.[13] But this could underestimate inequality in the surrounding years if unequally distributed capital gains were reallocated over time to the years with low tax rates. I have made no efforts to solve the third problem either, but refer to Section 4.4, where I report some results based on alternative definitions of capital income.

Considering these cautionary notes, we can now look at the evolution of income inequality in the 1990s. For *all* and for ages 30-54, there is definitely an increase in income inequality from 1990 to 1995 according to both measures of overall income inequality. The increase is also slightly larger for all persons than for prime age. This could reflect that a rising number of young students are included in the first group but not in the second. But the increase from 1990 to 1995 is only modest (if we can trust the revised numbers for 1990); the Gini increased by at most one percentage point and the 90/10 ratio from 2.58 to 2.78 for all persons (and slightly less for ages 30-

[12] See Björklund, Palme, and Svensson (1995a) for more information and a discussion.

[13] 1994 was the most extreme of these years. Realized capital gains increased from 17 billion Swedish crowns in 1993 to 59 billion in 1994 and fell back to 20 billion in 1995 (Statistics Sweden 1997).

54). Given the dramatic increase in unemployment and cuts in replacement rates in most social insurance systems, it is surprising that inequality did not rise even more.[14] For children, the stability in inequality in the 1990s is even more remarkable. The Gini coefficient has not changed from 1990 to 1995 and the 90/10 ratio reveals only a minor increase in inequality.

Figure 1b shows that the rise in overall inequality as measured by the 90/10 ratio can be attributed to changes in both parts of the distribution. The next question is how taxes and transfers have contributed to the evolution of income distribution.

For the three demographic groups, Figure 2 shows the Gini coefficient of:

1. Market income (income before taxes and tax-free transfers)
2. Market income minus taxes
3. Market income minus taxes plus transfers

The difference between item 1 and item 2 illustrates the equalizing impact from taxes. The difference between item 2 and item 3 illustrates the equalizing transfers impact.[15] As expected, the figure reveals a marked equalizing impact from taxes and tax-free transfers, and the *mechanical,* redistributive, transfers impact is somewhat higher than the taxes impact.

A noteworthy change occurred in the 1990s. The overall taxes and transfers impact has increased for all groups, and there is a clearly rising transfers impact, in particular for children.

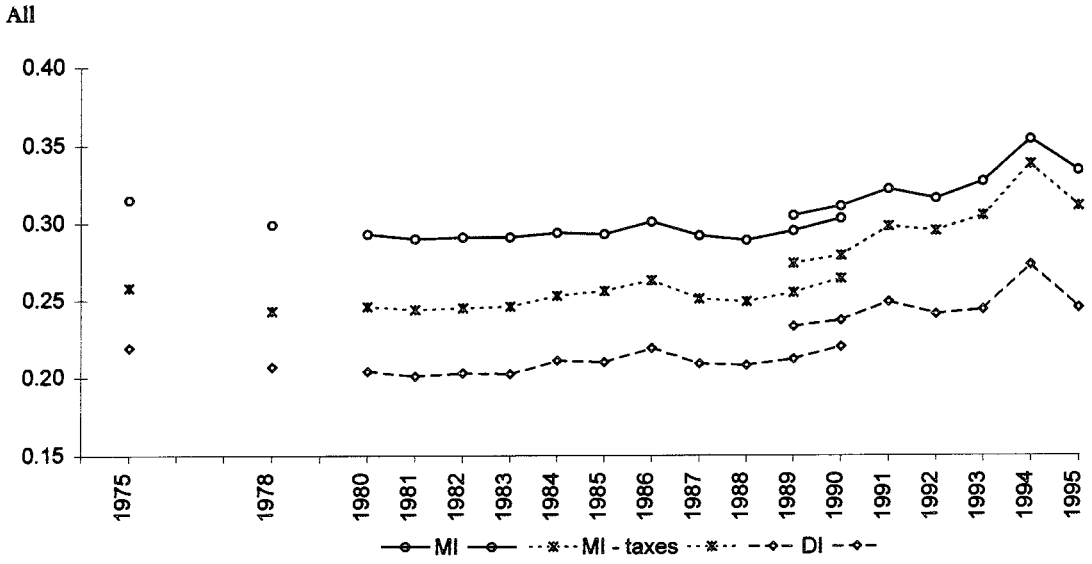
For 1991 and 1992, the increase in child allowances, which was part of the tax reform, is the most likely explanation for this development (see Björklund, Palme and Svensson, 1995b).

In 1995, child allowances were reduced again, so probably rising social assistance payments help explain that the equalizing transfers impact continued to increase in 1995.

[14] The Finnish experience in the early 1990s better illustrates that drastically rising unemployment need not lead to immediate large increases in income inequality in countries such as the Nordic ones; see Aaberge et al. (1997).

[15] It is hard to determine if taxes should be deducted before transfers are added, or if the opposite order should be used, but this choice does not qualitatively affect the conclusions. Figures are available from the author on request.

Figure 2. The equalizing impact of taxes and transfers. Gini coefficient of market income before taxes and tax-free transfers (MI), market income minus taxes (MI - taxes), and disposable income (DI).



Source: Statistics Sweden's *Income Distribution Survey*

Figure 2. Continued ...

Ages 30-54

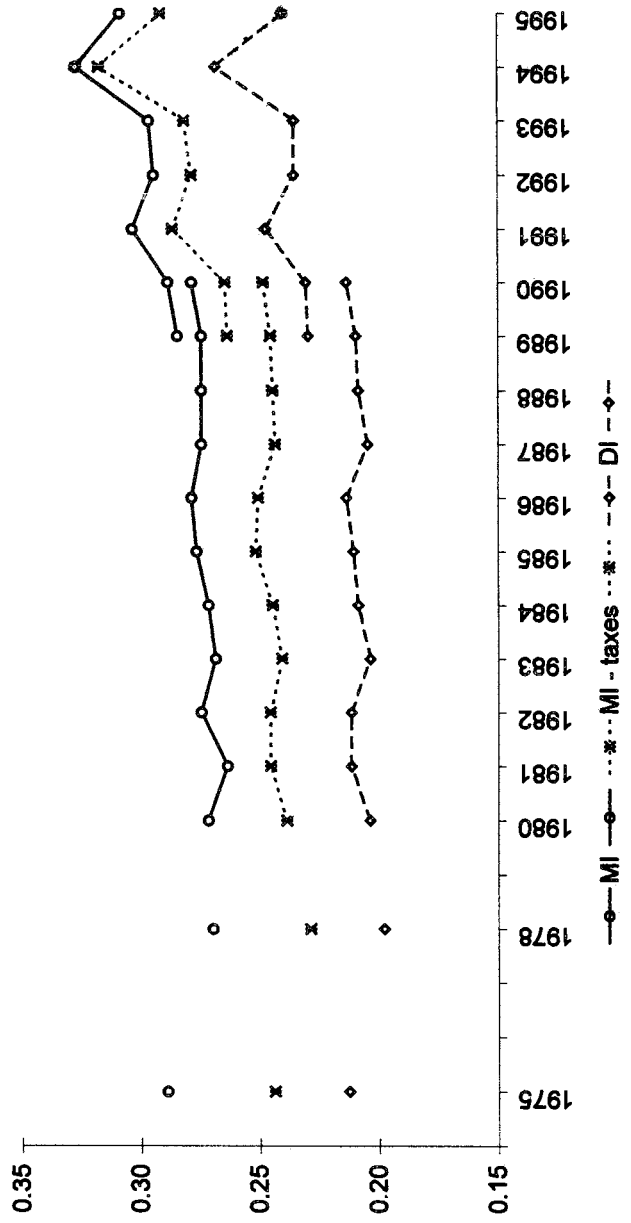
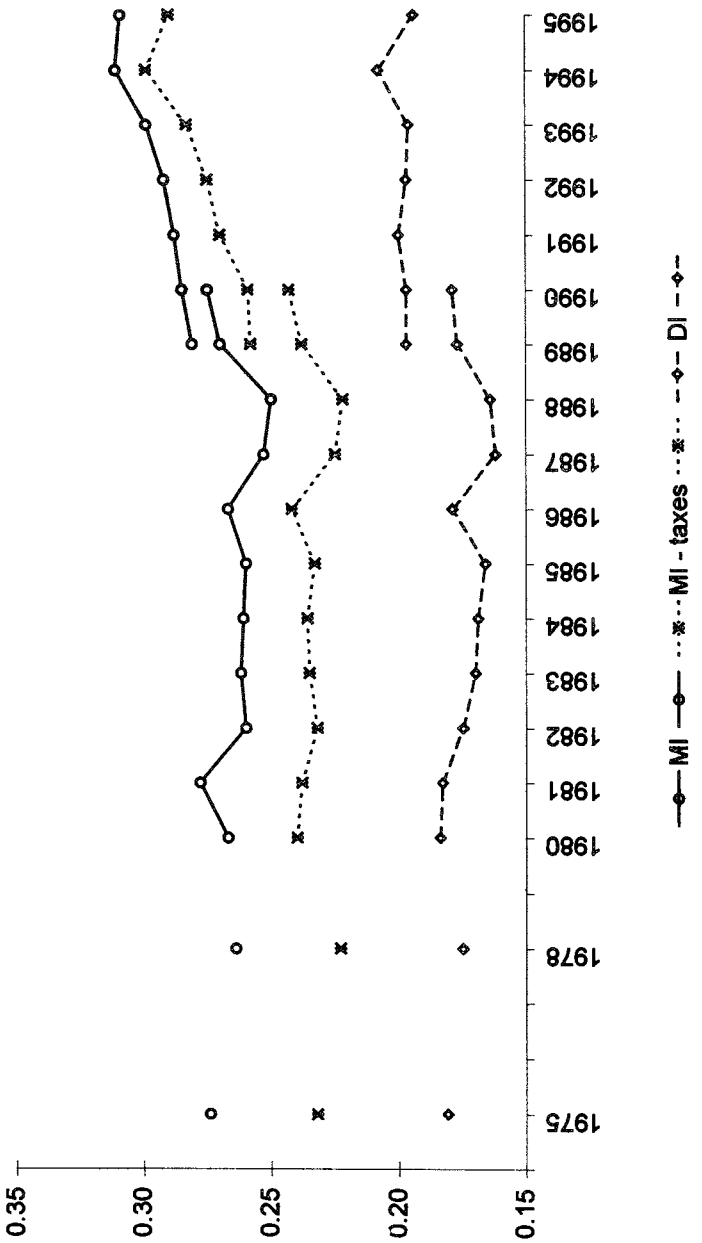


Figure 2. Continued ...

Children



2.2. The longer run

Because the Swedish welfare state expanded during the 1960s and early 1970s,[16] we would like to know how income distribution evolved during the period when the welfare state expanded. To infer that the equal distribution of income observed in the early 1980s is due to the build-up of the welfare state, we should observe falling income inequality during the 1960s and early 1970s.

Unfortunately, the information on income distribution before 1975 is meager. But there are two useful observations on inequality of disposable income for 1967 and 1980 from the *Swedish Level of Living Surveys*. Several authors have used this data set.[17] There are two striking patterns in the results. First, overall inequality declined markedly from 1967 to 1980 for several choices of equivalence scales and measures of inequality. The Gini coefficient, for example, declined by almost 10 percentage points, a very large number in light of the country differences reported in Section 3 and changes from 1975 to 1995 reported in Section 2. Second, the redistributive effect of taxes and transfers increased markedly from 1967 to 1980.[18] These findings strongly support the view that the expansion of the public sector contributed to a more equal distribution of disposable income.

Even though the *Level of Living Surveys* in all respects is a high-quality data set, these findings must be interpreted with some care. The main reason for this is that there is only one observation from the 1960s, and as we previously explained, Swedish data series on disposable income tend to be somewhat erratic. If 1967 was an *unusual* year, like 1994, the numbers might be misleading. But the large decline in inequality of hourly earnings from 1968 to 1981 is consistent with the evolution of inequality of disposable income (see Edin and Holmlund, 1995).

[16] Total public spending as a percentage of GDP expanded from 30% in 1960 to about 50% in 1975 and further to almost 70% in the early 1980s. See, for example, Lindbeck (1997) for a recent review of the rise of the Swedish welfare state.

[17] For example, Fritzell (1991), Gustafsson and Uusitalo (1990), Jansson (1990), and Åberg (1989).

[18] This finding must be interpreted with some care. All types of transfers were included in the analysis. Because the pension age was reduced during the period, it is not surprising that mechanical comparisons of pre- and post-transfer income suggest rising redistributive effects. A complete distributional analysis of pension systems requires a comparison between present values of contributions and payments (see Ståhlberg, 1990).

3. Cross-country comparisons—evidence from LIS

To compare income inequality in Sweden with other developed countries, I rely on results from studies based on the *Luxembourg Income Study* (LIS). The definition of disposable income in LIS differs from the one used by Statistics Sweden in some ways.[19] The two most important ones are that capital gains and student loans are taken out by LIS and not considered part of income. The reason for doing so is that this information is missing for some other countries, so cross-country comparability is in this way increased.

It is relevant to ask if one can expect any systematic bias in the estimates of inequality in Sweden compared to other countries in LIS. One argument in favor of an upward bias of inequality in Sweden is the fact that persons from the age of 18, who remain with their parents, are counted as separate households. Because they often are students with no or very low incomes, they are also counted as persons (and households) with low incomes, even though they most likely benefit from the economic resources of their parents. For the same reason, too high incomes are attributed to parents with children of this age who have not yet moved to their own housing. So some care is called for when interpreting Swedish inequality estimates based on samples in which youth between ages 18 and (say) 25 are included.

Another problem pertains to the rise in inequality in Sweden in 1991, when, as previously discussed, Swedish income concepts became broader and measured inequality rose as a consequence. My guess would be that this change implied that some unequally distributed components of income are measured more accurately in Sweden than in other countries. So in all, inequality estimates for Sweden are probably slightly overestimated, and the overestimation is probably higher after 1991. Further, the overestimation becomes higher, the higher the weight for young people in the sample investigated.

With these cautionary notes in mind, we now turn to some central results from studies based on LIS. I first focus on international comparisons of overall inequality and then turn to studies of specific *vulnerable* groups. Table 1a shows Gini coefficients and 90/10 percentile ratios for several countries in the LIS data set during the period from around 1980 to the early 1990s. Table 1b is similarly organized and shows 90/50 and 10/50 percentile ratios. The square root of the

[19] See Atkinson et al. (1995) for more detailed information on comparability among countries.

number of persons in the household is used as an equivalence scale, and inequality is measured among individuals with the assumption of equal sharing within the household. No age restrictions are used, and children are also included.

As Table 1a shows, Sweden had the most equal distribution of disposable income in the early 1980s, when 10 countries are included in the comparison. In the late 1980s and early 1990s, when more countries are included, Finland tops the list; Sweden is second. But the differences between the five countries with most equal distributions are quite small. In the early 1990s, these are the four Nordic countries and Belgium. In all periods, the U.S. had the most unequal distribution, but in the early 1990s the UK is not far behind.

Table 1b helps us determine to what extent the lower or the upper part of the distribution explains the outcomes for the various countries. The table gives the general impression that countries with low overall inequality have low dispersion in both parts of the distribution. And the high-inequality countries (UK and U.S.) have high dispersion in both parts of the distribution.

Many international comparisons of income distributions have particularly focused on specific *vulnerable* groups that historically have had high poverty rates and are in greater need of welfare-state arrangements than others. A general result from such studies has been that Sweden has done well in equalizing income and eliminating poverty among such groups. Korpi and Palme (1998, forthcoming) report that Sweden had the lowest overall inequality (measured by the Gini coefficient) and the second lowest poverty rate for elderly (ages 65 and older) among 11 OECD countries around 1985. Coder et al. (1989) and Fritzell (1992) get similar results for the period around 1980.

Comparative studies, which have focused on the income standard of children, also reveal favorable outcomes for Sweden regarding equality. Studies by Coder et al. (1989), Fritzell (1992), Jäntti and Danziger (1994), and Rainwater and Smeeding (1995) have shown four striking results for children in Sweden: Overall inequality is very low by international standards. Poverty rates are low. The absolute income level among the *poorest* Swedish children is high. These patterns hold for children living in both single and two-parent families.

Table 1a. Inequality of disposable income in OECD countries in the early 1980s, late 1980s, and early 1990s. Gini coefficient and P90/P10. Ranks by equality.

Country	Early 1980s			Late 1980s			Early 1990s		
	Gini coefficient, *year in italic* and **rank in bold**								
Finland	-			.207	*1987*	**1**	.227	*1991*	**1**
Sweden	.199	*1981*	**1**	.220	*1987*	**2**	.229	*1992*	**2**
Belgium	.228	*1985*	**3**	.234	*1986*	**4**	.230	*1992*	**3**
Norway	.222	*1979*	**2**	.234	*1986*	**3**	.230	*1991*	**3**
Denmark	-			-			.239	*1992*	**5**
Ireland	-			.328	*1987*	**13**	-		
Luxembourg	-			.238	*1985*	**5**	-		
Germany	-			.250	*1984*	**6**	-		
Netherlands	.247	*1983*	**4**	.268	*1987*	**7**	.268	*1991*	**7**
France	.297	*1979*	**8**	.296	*1984*	**10**	-		
Switzerland	.323	*1982*	**10**	-			-		
Italy	-			.310	*1986*	**12**	.255	*1991*	**6**
Canada	.286	*1981*	**6**	.289	*1987*	**8**	.285	*1991*	**8**
Spain	-			-			.306	*1990*	**10**
Israel	-			-			.305	*1992*	**9**
Australia	.287	*1981*	**7**	.295	*1985*	**9**	.308	*1989/90*	**11**
UK	.270	*1979*	**5**	.304	*1986*	**11**	.335	*1991*	**12**
U.S.	.309	*1979*	**9**	.341	*1991*	**14**	.350	*1991*	**13**
	P90/P10, *year in italic* and **rank in bold**								
Finland	-			2.59	*1987*	**1**	2.74	*1991*	**1**
Sweden	2.45	*1981*	**1**	2.72	*1987*	**2**	2.78	*1992*	**2**
Belgium	2.74	*1985*	**3**	2.79	*1988*	**3**	2.79	*1992*	**3**
Norway	2.77	*1979*	**4**	2.93	*1986*	**5**	2.80	*1991*	**4**
Denmark	-			-			2.86	*1992*	**5**
Ireland	-			4.23	*1987*	**13**	-		
Luxembourg	-			3.15	*1985*	**7**	-		
Germany	-			3.00	*1984*	**6**	-		
Netherlands	2.72	*1983*	**2**	2.85	*1987*	**4**	3.05	*1991*	**6**
France	3.48	*1979*	**6**	3.48	*1986*	**8**	-		
Switzerland	3.43	*1982*	**5**	-			-		
Italy	-			4.05	*1986*	**12**	3.14	*1991*	**7**
Canada	4.07	*1981*	**9**	4.02	*1987*	**11**	3.90	*1991*	**8**
Spain	-			-			4.02	*1990*	**9**
Israel	-			-			4.12	*1992*	**10**
Australia	4.05	*1981*	**8**	4.01	*1985*	**10**	4.30	*1989/90*	**11**
UK	3.53	*1979*	**7**	3.79	*1986*	**9**	4.67	*1991*	**12**
U.S.	4.93	*1979*	**10**	5.94	*1986*	**14**	5.78	1991	**13**

Notes: 1) The square root of the number of household members is used as equivalence scale. 2) Standard errors of the Gini coefficients are not available. For Sweden they tend to be around 0.004 for the Gini coefficient.
Sources: Atkinson et al. (1995) and Gottschalk and Smeeding (1997).

Table 1b. Inequality of disposable income in various countries in the early 1980s, late 1980s, and early 1990s. P90/P50 and P10/P50. Ranks by equality.

Country	Early 1980s		Late 1980s		Early 1990s	
	P90/P50, *year in italic* and **rank in bold**					
Finland	-		1.53 *1987*	**2**	1.58 *1991*	**2**
Sweden	1.51 *1981*	**1**	1.52 *1987*	**1**	1.59 *1992*	**4**
Belgium	1.63 *1985*	**3**	1.63 *1988*	**4**	1.63 *1992*	**5**
Norway	1.58 *1979*	**2**	1.62 *1986*	**3**	1.58 *1991*	**2**
Denmark	-		-		1.55 *1992*	**1**
Ireland	-		2.09 *1987*	**14**	-	
Luxembourg	-		1.84 *1985*	**7**	-	
Germany	-		1.71 *1984*	**5**	-	
Netherlands	1.76 *1983*	**4**	1.75 *1987*	**6**	1.73 *1991*	**6**
France	1.87 *1979*	**9**	1.93 *1986*	**10**	-	
Switzerland	1.85 *1982*	**7**	-		-	
Italy	-		1.98 *1986*	**12**	1.76 *1991*	**7**
Canada	1.83 *1981*	**6**	1.84 *1987*	**7**	1.83 *1991*	**8**
Spain	-		-		1.98 *1990*	**10**
Israel	-		-		2.05 *1992*	**11**
Australia	1.86 *1981*	**8**	1.87 *1985*	**9**	1.93 *1989/90*	**9**
UK	1.80 *1979*	**5**	1.94 *1986*	**11**	2.06 *1991*	**12**
U.S.	1.88 *1979*	**10**	2.06 *1986*	**13**	2.08 *1991*	**13**
	P10/P50, *year in italic* and **rank in bold**					
Finland	-		.59 *1987*	**2**	.58 *1991*	**1**
Sweden	.62 *1981*	**2**	.56 *1987*	**6**	.57 *1992*	**3**
Belgium	.59 *1985*	**3**	.59 *1988*	**2**	.58 *1992*	**1**
Norway	.57 *1979*	**5**	.55 *1986*	**7**	.56 *1991*	**5**
Denmark	-		-		.54 *1992*	**7**
Ireland	-		.50 *1987*	**10**	-	
Luxembourg	-		.59 *1985*	**2**	-	
Germany	-		.57 *1984*	**5**	-	
Netherlands	.65 *1983*	**1**	.62 *1987*	**1**	.57 *1991*	**3**
France	.54 *1979*	**6**	.55 *1986*	**7**	-	
Switzerland	.54 *1982*	**6**	-		-	
Italy	-		.49 *1986*	**11**	.56 *1991*	**5**
Canada	.59 *1981*	**3**	.46 *1987*	**13**	.47 *1991*	**10**
Spain	-		-		.49 *1990*	**9**
Israel	-		-		.50 *1992*	**8**
Australia	.46 *1981*	**9**	.47 *1985*	**12**	.45 1989/90	**11**
UK	.51 *1979*	**8**	.51 *1986*	**9**	.44 *1991*	**12**
U.S.	.38 *1979*	**10**	.35 *1986*	**14**	.36 *1991*	**13**

Notes: See notes for Table 1a.

The evidence in Sections 2 and 3 can be summarized in six conclusions:

1. Together with the other Nordic countries and Belgium, Sweden had the highest equality of annual disposable income among 10-14 OECD countries from around 1980 to the early 1990s. This result is quite robust and holds for most measures of inequality, and for most equivalence scales.
2. In an international perspective, equality was high and poverty rates low among vulnerable groups, such as the elderly, children, and single-parent families in Sweden during the same period.
3. The time-series information provided by Statistics Sweden's *Income Distribution Survey*, which covers the 1975-1995 period, shows that equality peaked in the early 1980s, but the rise in inequality since then has been modest.
4. The turbulent period of the 1990s is somewhat hard to characterize due to changes in income definitions, high realized capital gains in 1991 and 1994, and divergent patterns for various age groups. Among adults (ages 30-54) and children (ages 0-17), inequality remained remarkably stable despite the drastic increase in unemployment.
5. Most likely, a marked equalization of disposable income occurred from the mid 1960s to around 1980 when welfare-state policies were expanded and the government share of GDP increased rapidly.
6. Income taxes and tax-free transfers have had strong equalizing impacts on the distribution of disposable income.

4. How robust is the evidence?

How robust are these conclusions based on annual data? Are they only artifacts from using a single year as the time unit or from the specific income definitions that are employed? I start the discussion of these questions by reviewing results from studies that use data for longer time periods.

4.1. The time period

With perfect capital markets and perfect foresight, the individual can consume out of her lifetime income, independent of the time path of income. Lifetime income will be the sole determinant of *lifetime utility*. But without access to capital markets, fluctuations in the income

stream are also likely to affect lifetime utility. Assuming concave inter-temporal utility functions, it follows that the individual prefers an even stream of consumption (when family size is adjusted for). So fluctuations of income (adjusted for family size) will reduce lifetime utility. In general, it seems reasonable to argue that lifetime utility is a positive function of lifetime—or long-run or permanent—income and a negative function of income fluctuations. The better the individual can smooth her consumption path by means of the capital market, the less weight should be attached to fluctuations.

But to start, let us assume that we are willing to attach all weight to long-run income and ignore variability of income paths. Would the previously stated conclusions about successful outcomes of welfare-state policy, drawn from annual data, be changed? *A priori*, there are quite strong reasons to believe that distributions of lifetime income are markedly different from distributions of annual income. The early study by Blomquist (1981), in which he simulated distributions of lifetime income by using wage and hours equations estimated on longitudinal data for 1968 and 1974, suggests that inequality of lifetime income is 40-50% lower than annual income. Björklund (1993) used actual longitudinal data and compared inequality of market income of adult men over the 1951-89 period and found that inequality of income over this long period was 35-40% lower than cross-sectional inequality of annual income in the same period.

Another indication of high mobility of income, and thus a discrepancy between inequality of annual and more long-term inequality, comes from studies of transition matrixes of income in two time periods. Fritzell (1990) found that almost half of those in the lowest quartile of the distribution of family-sized, adjusted, disposable income in 1997 had moved to a higher quintile seven years later. In a recent study, which has received attention in Swedish media, Uddhammar (1997) reports patterns of mobility in disposable income from 1985 to 1991. He focuses upon those 5.6% of the population with disposable income below 50% of the median income in 1985. This group seems to be particularly mobile because only 19% had very low incomes also six years later.[20]

[20] More information is needed to reconcile the Fritzell and Uddhammar findings. But it seems as though those at the very bottom of the income distribution are particularly mobile. The conditional probability of those at the very bottom of the income distribution in 1985 to be in the top of the distribution in 1991 is higher than for those next to the bottom.

Thanks to better access to longitudinal data sets in which individuals have been followed over longer periods than one year, there is now a rapidly expanding literature that focuses on income distribution in much longer time perspectives than a single year. A few recent studies have employed longitudinal data sets from several countries, have defined as similar income concepts and samples as possible, and have compared inequality of annual and long-run income among countries. Because of the properties of standard inequality measures, inequality of annual and long-run income will be the same if relative incomes of all individuals remain constant in each period.[21] The more changes of relative incomes that there are, the lower inequality of long-run income will be. In principle, changes of relative income can be so frequent and of such magnitudes that long-run income is completely evenly distributed. Changes in relative incomes over time, which reduce long-run inequality, can be called income mobility.

Table 2 summarizes results from three such studies that have focused upon inequality of labor earnings of individuals, that is, the nature of pre-tax inequality, which the labor market generates.[22]

As expected, the results in all three studies confirm that the U.S. is the country with highest annual inequality. But what is striking is that prolonging the time period does not bring the U.S. much closer to European levels of inequality. Somewhat surprisingly, Germany has a higher degree of mobility than the U.S. in the two studies where both countries are included. The results for Sweden and the U.S. in the study by Aaberge et al. (1996) can illustrate that the differences in mobility between the countries are quite small: the Swedish Gini for annual income is 65.6% of the corresponding U.S. Gini, whereas the Swedish Gini for long-run income is 68.4% of the U.S. Gini. Results in OECD (1996), based on the transition-matrix approach, support the view that the similarity of earnings mobility patterns across countries are more striking than the differences.

[21] The Gini coefficient has a slightly different property in this respect; the Gini of income in single periods equals the Gini of average income over longer periods if the units (here the individuals) in the sample do not change rank. See Shorrocks (1978).

[22] The exact definitions of labor earnings and other choices involved in studies of earnings and income distribution differ among the studies but are as similar as possible for each country in each study. More detailed information about measurement and more results (including various sensitivity analyses) can be found in the original papers.

Table 2. Annual inequality, long-run inequality, and percentage reduction in inequality from extending the time period. Pre-tax earnings of individuals. Results from three studies.

Study	Country	Inequality measure	Long-run time period	Average annual inequality	Long-run inequality	Percentage reduction, *mobility*
A. (1996) [a]	Denmark	Gini	1980-90	.239	.220	8.0
	Norway	Gini	1980-90	.264	.256	6.9
	Sweden	Gini	1980-90	.252	.234	7.3
	U.S.	Gini	1980-90	.384	.342	10.9
OECD (1997)	Denmark	Theil-0	1986-91	.044	.039	11.0
	France	Theil-0	1986-91	.122	.109	11.0
	Germany	Theil-0	1986-91	.077	.065	15.4
	Italy	Theil-0	1986-91	.060	.053	12.1
	UK	Theil-0	1986-91	.102	.090	11.4
	U.S.	Theil-0	1986-91	.185	.163	11.7
B. & P. (1997) [b]	Germany	Gini	1983-88	.240	.224	6.5
	U.S.	Gini	1983-88	.339	.323	4.8
	Germany	Theil-1	1983-88	.116	.089	23.6
	U.S.	Theil-1	1983-88	.240	.216	10.2
	Germany	Theil-0	1983-88	.116	.083	18.5
	U.S.	Theil-0	1983-88	.196	.178	10.8

Note: The original studies contain more detailed information about data sources, income concepts, and sample criteria.

[a] A. = Aaberge et al.

[b] B. & P. = Burkhauser and Poupore

Table 3 is organized in the same way as Table 2 and shows similar results for disposable income adjusted for family size.[23] The overall conclusions are about the same as for earnings. The popular view that inequality in the U.S. is largely attributable to a high degree of income mobility gets no support at all.[24]

So an overall result from these studies is that mobility of earnings and incomes during periods up to 11 years are strikingly similar across countries. So the ranking of countries regarding inequality is not very much affected by the length of the time period that is used. Conclusion 1—that Sweden internationally ranks high regarding

[23] Due to comparability problems, the measures of disposable income are less complete than the ones used in Sections 2 and 3.

[24] Fritzell (1990), using the transition matrix approach, 1973 to 1980 for Sweden and 1971 to 1978 for the U.S., also finds remarkably similar mobility of disposable income in the two countries.

equality—does not seem to be an artifact of using annual data. The results also imply that the relatively high inequality that is observed in the U.S. is attributable to permanent inequality, not to higher mobility of earnings and income among individuals and families.

Nonetheless, some reservations are in order. The results might be due to the fact that it has not been possible to use data from complete life cycles but only time periods up to 11 years long.[25] And even though the authors of these studies have made large efforts to achieve comparability among countries, it is more difficult to achieve such comparability for longer time periods than for a single year.

Some information in recent studies also helps us determine whether conclusion 6 is an artifact of using annual data, that is, whether the equalizing impact of taxes and transfers vanishes when the time period is extended. The studies by Aaberge et al. (1996) and Burkhauser and Poupore (1997) also contain information about inequality of market income (pre-tax and transfer income) and disposable income (post-tax and transfer income) for both single years and for the longer time periods in Table 3. For all five countries included in the two studies, the percentage reduction of inequality was practically the same for a single year and for the long time periods applied in the studies. So at least the combined effects of taxes and transfers do not seem to disappear when the time period is prolonged.

But it is a strong assumption to attach all weight to long-run income and completely ignore individual income variability that contributes to cross-sectional inequality. To determine how important the latter is, information about the nature of income variability is useful. If disposable incomes fluctuate for the wealthy, for example, because of capital gains, then variability hardly represents welfare losses

[25] Even though such a reservation is motivated, some results suggest that the impact of the length of the period on the percentage reduction of inequality declines markedly after 5-10 years, (Gustafsson, 1994 and Zandvakili and Gustafsson, 1997). This finding is not inconsistent with the previously discussed results—that inequality of lifetime income is around 40% lower than cross-sectional inequality of the population. The reason is that cross-sectional inequality of annual income includes the impact of inequalities among cohorts, whereas the longitudinal studies of income mobility are done for a limited number of cohorts.

Table 3. Annual inequality, long-run inequality, and percentage reduction in inequality from extending the time period. Disposable income of families. Results from two studies.

Study	Country	Inequality measure	Long-run time period	Average annual inequality	Long-run inequality	Percentage reduction *mobility*
A. (1996) [a]	Denmark	Gini	1980-90	.221	.204	7.8
	Sweden	Gini	1980-90	.225	.195	13.5
	U.S.	Gini	1980-90	.336	.305	9.2
	Denmark	Gini	1986-90	.237	.224	5.4
	Norway	Gini	1986-90	.213	.197	7.5
	Sweden	Gini	1986-90	.202	.183	9.4
	U.S.	Gini	1986-90	.341	.321	6.0
B. & P. (1997) [b]	Germany	Gini	1983-88	.266	.238	10.6
	U.S.	Gini	1983-88	.378	.353	6.5
	Germany	Theil-1	1983-88	.124	.094	24.1
	U.S.	Theil-1	1983-88	.271	.233	13.9
	Germany	Theil-0	1983-88	.127	.093	26.5
	U.S.	Theil-0	1983-88	.272	.221	18.7

Note: See notes for Table 2.
[a] A. = Aaberge et al.
[b] B. & P. = Burkhauser and Poupore

for these people and does not cause severe inequities. An uneven income path due to college studies during young age, followed by high and stable incomes as an adult, can hardly be considered problematic either. If instead, incomes fluctuate strongly for those with low long-run income, the variability might represent a welfare loss. Inequality of long-run income would in this case underestimate inequality of lifetime utility.

A recent study by Björklund and Palme (1997) on Swedish data provides some information about the relationship between long-run income over 18 years and inter-temporal income variability for single individuals during the same period. For this long time period, they compute inequality of long-run income among individuals and inter-temporal income variability for each individual in the sample using the same measure of inequality. With this information, it is possible to characterize income variability.

Table 4 shows the magnitude of income variability by quartiles in the distribution of long-run income. Results are reported for Theil-0 and Theil-1 measures of inequality; the former measure is more sen-

sitive to low incomes. Also note that the Theil measures, like most measures of income inequality, capture relative inequalities, so in this case, the individual's income variability is measured relative to his long-run level of income. Results are also reported for two samples: one that includes youth plus young adults and another with only prime-age adults.

One conclusion from the results in the table is that variability of household market income (pre-tax and transfer income adjusted for family size) is highest for those with low long-run disposable income. This pattern holds for both samples. In the adult sample, income variability is higher in the top quartile than in the second and third. So the general pattern is that those who suffer most from low long-run income also suffer the most from income variability. Most likely, those with low long-run income have less access to a perfect capital market than those with high long-run income. It follows that income variability cannot be neglected in a study of income inequalities, even if lifetime utility is the overall norm for equity.

A second result from the table is that the equalizing impact on income variability of taxes and transfers is highest for those with low long-run income.[26] So the welfare state seems to do a good job in stabilizing income paths for those who need it most.

The study also examined the extent to which taxes and single transfer schemes affect the two dimensions of inequality, the long-run component and the component that shows variability. It is possible that some transfers, at least for some measures of inequality and for some equivalence scales, only affect income variability but not inequality of long-run income or vice versa. Indeed, it is even possible that for some transfer schemes, a conflict is involved so that, for example, income variability is reduced but inequality of long-run income is increased. The results for the separate impact of taxes, universal child allowances and means-tested housing allowances for the two samples, the two Theil measures of inequality, and for two equivalence scales suggest that no such conflict is involved. In all cases, both inequality of long-run income and individuals' income variability were reduced. So these two goals of income inequality seem to be complementary and reinforce each other rather than to be in conflict with each other.

[26] This is true both for the absolute decline in variability and the percentage reduction in variability.

Table 4. Average income variability in each quartile of long-run disposable income (1974-1991).

	Theil-0				Theil-1			
Sample 1 (ages 18-32 in 1974, ages 35-49 in 1991)								
Quartile	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Household market income	.298	.116	.102	.088	.103	.060	.053	.058
Disposable income	.219	.094	.073	.068	.078	.049	.041	.049
Sample 2 (ages 33-47 in 1974, ages 50-64 in 1991)								
Household market income	.246	.041	.037	.042	.061	.032	.028	.048
Disposable income	.149	.030	.033	.041	.044	.025	.025	.048

Notes: 1) Theil-0 and Theil-1 are used as measures of variability. 2) The square root equivalence scale is used in the estimations reported in the table, but the results hold for an equivalence scale that attaches zero weight to children. 3) Income variability is measured as variability around the 18-year average income of the individual. The results are qualitatively the same when variability is measured as deviations from smooth (second-order) trend. 4) Disposable income is household market income taxes + child and housing allowances.
Source: Björklund and Palme (1997).

4.2. Full income

Another criticism of using current annual income to evaluate how successful the welfare state has been in achieving economic equity is that the same weight is attached to differences in income that are due to variation in working hours as to income differences that are due to differences in inherent working capacity. This is potentially very misleading in cases when those with lower working hours have specialized in household production or simply have stronger preferences for leisure. There is no simple way to solve this problem, but the literature offers some attempts to extend the traditional approach in this direction. For example, Jenkins and O'Leary (1996) have estimated inequality of household income plus household production and found that the distribution of such an extended income measure deviated in many respects from the distribution of the traditional income measure.

For Sweden, it would be interesting to know if conclusions 1-6 in Section 3 would be affected if such a broader concept of income, also called full income, is used. Björklund, Palme, and Svensson (1995b) attempted to control for differences in working hours by

evaluating a standard working time by the wage rate of the individual. The results suggest that the decline in income inequality from 1967 to 1980 was not as large for hours-adjusted annual income as for actual annual income. But there were no marked differences between the two income concepts in the equalizing impact of taxes and transfers.

4.3. Public consumption

Following the Haig-Simons income definition, it is natural to include the value of public services in a complete measure of income. As regards the choice of time period and the treatment of differences in working hours, one could expect that the distribution of income would be strongly affected by inclusion of the value of such services. Fritzell (1994) made an attempt to estimate the value of child care, education, health services, and care of the elderly and added these values to current income. Not surprisingly, the structure of income distribution was markedly changed.

From an international perspective, it would be interesting to know whether the conclusion of good Swedish achievement regarding equality would be affected by inclusion of the value of such services. Smeeding et al. (1993) made an attempt to include the value of non-cash subsidies for health, education, and housing for Australia, Canada, Sweden, West Germany, the Netherlands, UK, and U.S. The major result was that such non-cash subsidies rather reinforced the equalizing impact of cash transfers. So this extension of the traditional income concept did not affect the ranking of countries.

4.4. Capital income

Many economists argue that the measurement of capital income is the major weakness in modern income distribution statistics. This might very well be the case, so it is an important task for the statistical offices to get the additional information that is needed to improve measurement of such income. But the crucial question is if conclusions, such as those previously drawn, would be markedly different if capital income were to be better measured. A few attempts have been made to check if results in Swedish income distribution studies are sensitive to the definition of capital income.

Björklund, Palme and Svensson (1995a, b) investigated whether the distributional impact of taxes and transfers, according to the standard before-and-after comparison, is changed if alternative meas-

ures of capital income are used. They replaced income from capital measured by Statistics Sweden by:

- A 3% real return on estimated market value of wealth
- The maximum of income from capital measured by Statistics Sweden and 3% real return

The separate impacts of taxes and transfers were not changed, but overall inequality in 1991 was reduced making the evolution of inequality in the 1990s less erratic.

The Ministry of Finance (1996) examined whether the time-series pattern of Swedish income distribution from 1975 to 1994 is much affected by the definition of capital income. They adjusted capital income for inflation by counting only a fraction of nominal capital as real income, the fraction being determined by one minus the ratio of the nominal interest rate and CPI inflation. Even though this is a crude adjustment, it is interesting to note that the long-term evolution of income distribution is not very much affected. But the evolution over the 1990s becomes less erratic with lower inequality in 1991 and 1994.

No doubt more attention should be paid to and more resources be allocated to the measurement of capital income. Even though conclusions, such as numbers 1-6, would not necessarily be very much affected if capital income were to be better measured, the confidence in income distribution statistics among economists would be raised a lot.

5. Equality of opportunity—intergenerational earnings mobility

There has also been a strong emphasis on equality of opportunity in Swedish welfare-state policy: *life's opportunities should not be affected by the size of parents' wallets*. It is far from obvious how such a goal can be made operational. One criterion, which can be implemented empirically, is that the outcome in an individual's life is independent of her family background. Simple correlations of the outcomes of members of different generations of the same families, such as fathers and sons, provide this information. High correlations would suggest low intergenerational mobility and also a low degree of equality of opportunity.

The study of intergenerational mobility of economic and social status has a long tradition in sociology. One strand of the sociology literature has examined class mobility, primarily between fathers and sons.[27] Another strand of literature has studied how *social status* is transmitted between generations.[28] Because my focus is on income inequality, I instead review a rapidly expanding economics literature on intergenerational correlations in earnings and incomes.[29] Within the economics profession, there has been an interest in such correlations for a long time.

The publication of two studies in 1992, by Gary Solon and David Zimmerman, on U.S. data in the same issue of the *American Economic Review* stimulated more such studies for several countries and several cross-country comparisons. Solon and Zimmerman found that the correlations between (the log of) fathers' and sons' long-run incomes were higher than previously believed: around 0.4, or maybe even as high as 0.5. Conversely, the results imply that this kind of intergenerational mobility was lower than previously believed.

Solon and Zimmerman also clarified some methodological issues involved in estimating such correlations from the research data sets that are available today.[30]

Table 5 shows a subset of recent studies of such correlation studies. I only include estimates of earnings correlations between fathers and sons. For several reasons, some care is called for in interpreting the results; there are both data quality and other methodological issues involved in these studies and the literature is still very new. But there is one pattern that *cannot* be found in the results. The popular view in American political rhetoric, that the U.S. is a country that offers a high degree of equality of opportunity that compensates for high cross-sectional inequality, gets no support in these results.

[27] Erikson and Goldthorpe (1992) is a modern classic in this field of literature.

[28] See, for example, Treiman and Ganzeboom (1990) for an informative survey.

[29] The following section is based on Björklund and Jäntti (1997b) in which more detailed information as well as a comparison with the sociological literature can be found.

[30] Note that the correlation coefficient between fathers' and sons' log income equals the elasticity of sons' income regarding fathers' income if there is no long-run trend in the variance of male income.

Table 5. Results from studies of father-son earnings correlations for various countries.

Author(s) and country	Measure of earnings	Age of sons	Estimate of father-son earnings correlations
		Studies of single countries	
Solon (1992), U.S.	1. Annual earnings 2. Hourly wage	25-33	1. .41-.53 2. .45
Zimmerman (1992), U.S.	1. Wages+salaries 2. Hourly wage	29-39	1. .40-.54 2. .38-.39
Altonji & Dunn (1991), U.S.	Annual earnings	29-39	.39
Corak & Heisz (1996), Canada	Total income	28-31	.19
Dearden et al. (1996), UK	Weekly wages	31	.39-.59
Jäntti & Österbacka (1995), Finland	Annual earnings	Average age: 34.8	.22
		Cross-country comparative studies	
Björklund & Jäntti (1997a)	Annual earnings	Sweden: 29-38 U.S.: 28-36	Sweden: .23 U.S.: .33
Couch & Dunn (1997)	Annual earnings	Germany: 22.8[a] U.S.: 24.9[a]	Germany: .12 U.S.: .17
Wiegand (1997)		Germany: 25-33 U.S.: 25-33	Germany: .29-.33 U.S.: .41-.53

Comments: For Corak and Heisz: 1) The estimates are elasticities. 2) Non-linear relationships implying higher mobility at the lower end of the distribution were found. For Björklund and Jäntti: the P-value of a one-tailed test of equal correlation was only 0.19. For Couch & Dunn: the low age of sons can explain that correlations are low for both countries. For Wiegand: the study is a comment on Couch and Dunn, and the author claims that his results are more reliable. The results for the U.S. are not new estimates but taken from Solon (1992).

Notes: 1) For more detailed information, see the original studies and Björklund and Jäntti (1997b). 2) For some studies, the standard errors of the correlation coefficients are as high as 0.10. 3) The range of values refers to results from alternative techniques to estimate the correlations.

[a] Average.

On the contrary, the pattern that can be found in the results goes in the opposite direction. Both cross-country studies (Sweden-U.S. and Germany-U.S.) suggest higher correlations for the U.S., even though the differences might not be statistically significant. Among the studies of single countries, the U.S. and the UK, both countries

with high cross-sectional inequality, come out as countries with high correlations and hence low intergenerational mobility.

It would be premature to argue that cross-sectional equality on one hand, and equality of opportunity on the other, are complementary and tend to reinforce each other. But the burden of proof seems to be heavy for those who argue that politics involves a choice between these two dimensions of equality.

6. Summary and discussion

In this paper, I reviewed income distribution in Sweden according to three dimensions of equality:

1. Cross-sectional equality of annual disposable income
2. Economic equality in a longer time perspective
3. Equality of opportunity as measured by correlations between income of fathers and sons

For obvious reasons, most empirical data are available for annual data. Even though there are some conceptual and practical problems involved in measuring disposable income over one year, there is now quite good time-series information on this dimension of equality. It seems, for example, as though Sweden has been able to retain its position among OECD countries as one of the four or five countries with the most equal distributions of annual disposable income even in the midst of the deep recession in the early 1990s.

It is sometimes argued that lifetime equality and equality of opportunity represent more basic and more valuable dimensions of equity. Of course this is partly a matter of values. But it is also an empirical question how much people are hurt by volatile income paths or by temporarily low incomes. A few years of very low disposable income for young students is probably not much of a problem, whereas the consequences could be severe for families with children. So it is important to learn more about the nature of the income variability that contributes to inequality of annual income but is neglected in studies of lifetime income, before one can determine what weights should be attached to these different dimensions of inequality.

Another important question is how different types of policy affect these three different dimensions of equality. One hypothesis could be that politics involves a choice between, on one hand, a society of (say) the U.S. or the present UK type with a high degree of cross-sectional inequality but instead quite equal lifetime outcomes and high

degrees of equality of opportunity, and on the other hand a society of the Swedish type with high cross-sectional equality but not lower long-run equality or less equality of opportunity. An alternative hypothesis could be that these three dimensions of equality rather reinforce each other in the sense that smoothing of income paths also contributes to more equal lifetime outcomes and more of equality of opportunity.

My interpretation of the available evidence that I have reviewed in this paper is that the latter hypothesis is the most plausible one. In particular, three pieces of evidence speak in favor of this hypothesis and against the first one. First, studies that have prolonged the time period to longer periods than one single year show no sign of convergence in inequality between countries as the time unit is made longer. Second, in Swedish data, inter-temporal income variability is highest for persons with low long-run incomes, and taxes and transfers that smooth inter-temporal variability *also* equalize long-run income. Third, there are no indications that intergenerational connections are weaker in the U.S. and the UK, rather the opposite pattern can be found in data.

To understand why this interpretation could be reasonable, it might again be useful to consider families with children. If welfare state policies stabilize income paths for such families by sheltering them from dips in market income, not only annual incomes are equalized, but probably also lifetime incomes. A more stable private economy for such families could also make them more prone to invest in the future of their children.

No doubt, more research is needed to corroborate my somewhat speculative conclusions. Some specific policies might also mainly affect annual incomes without any effects, or even regressive effects, on more long-run outcomes. But if my conclusions are correct, it becomes more important to tell politicians that the three dimensions of equality are closely related to each other and that they tend to reinforce each other, rather than telling them that politics involves a choice between these alternative dimensions of equality.

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