Inherent Inequality and the Extent of Redistribution in OECD Countries

Hannu Tanninen and Matti Tuomala*

The OECD's postwar history can be divided, at least roughly, into two phases (see Kanbur 2000). From 1945 to about 1980 the degree of inherent inequality or the inequality of market incomes (incomes from earnings and investment) decreased because of reduction in skilled/unskilled wage differentials and asset inequality. The second phase occurred between 1980 and the mid-1990s when the degree of inherent inequality reversed course and increased. It is striking that in a number of OECD countries inherent inequality increased between 1980 and the mid-1990s but, perhaps surprisingly, redistribution as well. This is nicely illustrated in the case of Canada in Figure 1.

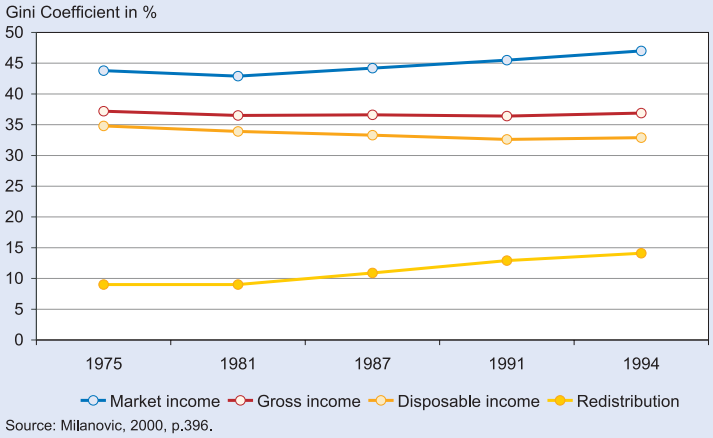
What might be an explanation for this development of redistribution policy? There is now considerable literature on the relationship between inequality and growth (see Persson and Tabellini 1994; Alesina and Rodrik 1994; Perotti 1996; Tanninen 1999). A key element in this literature is the link between inherent inequality and the extent of redistribution. The explanation in this literature is the political mechanism (the median voter theory) through which greater inherent inequality leads to greater redistribution. The median voter theory implies that if there is a redistribution of income within the society, so that the income of the median voter increases, then the demand for redistribution in the society will rise even though the average income remains the same.[1] There are, however, some well-known and less well-known limitations of this theory. First, we know that in many OECD countries voter participation rates are relatively low. This means that the median voter is not the median income earner. Secondly, it is hard to believe that the middle income voters are able to determine that they belong to the fifth or sixth decile of the market income distribution.

An analytical framework for thinking through the relationship between inherent inequality and the extent of redistribution is put forward by James Mirrlees in his Nobel Prize winning paper (Mirrlees 1971). It captures the central features in thinking about the evolution of redistribution policy. Three elements of the Mirrlees model are useful for our purposes. The first is the concept of inherent inequality which reflects, among other skilled/unskilled wage differentials, asset inequality and social norms. If there is no intervention by the government, the inherent inequality will be fully reflected in the disposable income. However, if the government wants to intervene – as it seems to be the case in OECD countries – it will find the second component of the Mirrlees model, the egalitarian objectives of the government. And if the government tries to redistribute income from high-income people to low-income people, there will be incentive and disincentive effects. In other words the redistribution policy is the product of circumstances and objectives. Of course, distributional objectives differ from one coun-

* Hannu Tanninen is Lecturer for Economics at the University of Kuopio, Finland (hannu.tanninen@uku.fi); Matti Tuomala is Professor for Economics at the University of Tampere, Finland.

Figure 1

Income Inequality and Redistribution in Canada



Source: Milanovic, 2000, p.396.

[1] Greater inherent inequality is usually expected to increase the gap between mean and median incomes, leading to more redistribution because the loss to the median voter from an increase in the tax rate is now reduced relative to his or her gain from the increased amount available for redistribution (see Meltzer and Richard 1981; Persson and Tabellini 1994).

try to another and from one government to another, but there have not been significant changes in the overall progressivity of the OECD countries between 1985 and 1994 (see Messere 1998), given that we believe holding constant the degree of egalitarianism espoused and the level of incentive effects between the 1980s and the mid-1990s are not bad approximations.

What the data say

Most of the median voter studies mentioned above utilise data sets including the largest possible number of countries all around the world. For example a recent and widely used data set compiled by Deininger and Squire (1996) covers 108 countries and 682 observations. However, such data sets have many problematic features that are discussed in detail by Atkinson and Brandolini (2001). Furthermore, as Milanovic (2000) has recently pointed, in all mentioned studies inequality is measured from disposable income and, therefore, those studies do not properly make a distinction between inherent income and redistribution. Fortunately this distinction is taken into account in the Luxembourg Income Study (LIS), which is a comparable data on income distribution for a maximum sample of 25 countries. The income and recipient concepts employed here are market income (MI), gross income (GI) and disposable income (DPI) per household where the latter has been adjusted by the square root of household member (for different definitions of income see Atkinson, Rainwater and Smeeding 1995). We measure inequality with the Gini coefficient and our measure of redistribution is the difference between Gini coefficients calculated from market and disposable incomes.[2]

Table 1

Changes in the inequality between 1980 and the mid-1990s in 12 OECD-countries
(Gini coefficient for different income definitions)

Percentage point changes between "first wave" and "fourth wave" in the LIS database					
Country	Years	MI	GI	DPI	RD
Australia	81–94	5.6	3.3	3.2	2.4
Belgium	85–92	–4.2	5.1	–0.7	–3.5
Canada	81–94	4.1	0.4	–1.0	5.1
Finland	87–95	5.7	1.7	2.2	3.5
France	79–89	1.9	–2.2	–0.4	2.3
Germany	81–94	6.3	4.5	1.8	4.5
Italy	86–95	5.2	–	3.9	1.3
Netherlands	83–94	–5.5	–2.8	–0.2	–5.3
Norway	79–95	1.1	–2.1	–1.8	2.9
Sweden	81–95	4.1	1.7	2.0	2.1
UK	79–95	10.1	8.2	8.0	2.1
USA	79–94	6.2	5.7	5.8	0.4

Source: Milanovic (2000, p. 396–98).

As we are interested in the development of redistribution, our focus is on those 12 OECD countries with at least three or more observations (compared to a total of 24 countries and 79 observations available in Milanovic 2000). The evolution of the Gini coefficients in Table 1 can be summarized as follows. Over the sample period the inequality of market income as well as the extent of redistribution has risen in all selected OECD countries, except Belgium and the Netherlands, where the opposite is true.

We investigate the relationship between inherent inequality and the redistribution by utilising the following linear version

$$RD = \alpha CONST + \beta MI + \gamma_i X_i + \varepsilon$$

where RD is the extent of redistribution measured in terms of the difference between the inequality measure for market income (MI) and the inequality measure for disposable income (DPI). X_i denotes our three control variables, namely dependence ratio (DEP_R), public employment as percent of total employment (GE) and natural logarithm of openness (LOPEN), and country dummies.[3]

Table 2 reports the results for the relationship between inherent inequality and the extent of redistribution for 12 OECD countries with three or more observations between 1967 and 1997.[4] Given our control variables for population structure, government employment, openness and unobserved country differences, Table 2 (column 5) indicates that one standard deviation increase in the Gini coefficient for market income (i.e., 4.42) will increase the redistribution by 2.8 percentage points. In terms of standard deviations this is

[2] Note that in the empirical literature the overall size of the public sector is conveniently used as an approximation of redistribution (see e.g. Perotti 1996; Tanninen 1999; Bjornvatn and Cappelen 2003). In our case the correlation is 0.7.
[3] Full assessment of the extent of redistribution would also take into account various publicly provided services at less than market value, which in Nordic countries are considerable. Many of these items – health care, education and social services – are very extensive.
[4] It should be noted that our data set is an unbalanced panel with regards to the number of observations for individual countries and to the division of observations between different decades or between different waves of collection.

around 0.60 standard deviations of the extent of redistribution. [5]

Of our three control variables, the percentage share of government employment in total employment enters significantly into our regression equations in Table 2. Interestingly, when comparing columns (3) and (5) we can find some evidence that redistribution has been organised through public employment in the Nordic countries and to a lesser extent in Canada, France and Belgium. Our second control variable, dependency ratio does have a negative but statistically insignificant effect on redistribution. Our third control variable, logarithm of openness enters with a significantly positive coefficient into our regression equations only in column (2) where we do not have country dummies. Finally, to control fixed effects, country dummies give us some indication of the general attitude towards redistribution in the society compared to that in the United States. Not surprisingly, all of the coefficients have a positive sign.

[5] The results are in line with Milanovic (2000) who mainly concentrated on the development of income share gain between the market and the disposable income of particular income groups (i.e. bottom half, bottom 20 percent or the middle class).

Table 2

Inherent inequality and redistribution in 12 OECD-countries
(Gini coefficient, OLS)

	(1)	(2)	(3)	(4)	(5)
CONST.	–7.270 (–1.24)	–22.709 (–2.56)	–24.595 (–7.07)	–19.528 (–2.34)	–30.615 (–10.16)
MI	0.467 (3.70)	0.529 (7.38)	0.699 (10.10)	0.620 (8.93)	0.637 (11.02)
GE		0.443 (5.99)		0.600 (5.05)	0.581 (5.66)
DEP_R		–0.329 (–1.50)		–0.246 (–1.58)	
LOPEN		4.042 (5.49)		–0.727 (–0.58)	
D-Australia			4.346 (6.22)	4.057 (4.77)	3.883 (7.22)
D-Belgium			13.537 (17.75)	12.197 (5.06)	11.229 (13.46)
D-Canada			4.537 (4.99)	1.527 (0.91)	1.261 (1.34)
D-Finland			11.904 (11.95)	7.607 (3.49)	7.507 (5.88)
D-France			5.391 (6.95)	2.531 (2.05)	2.012 (2.22)
D-Germany			8.253 (9.80)	8.607 (6.21)	8.472 (12.87)
D-Italy			4.298 (3.84)	3.017 (1.99)	3.250 (2.99)
D-Netherlands			5.693 (7.09)	7.360 (3.33)	6.812 (10.44)
D-Norway			10.575 (11.13)	4.135 (1.59)	3.173 (2.33)
D-Sweden			11.886 (6.44)	5.155 (1.89)	4.314 (2.33)
D-UK			4.677 (4.28)	3.607 (2.32)	2.671 (3.02)
n. obs.	55	55	55	55	55
Adj. R^2	0.186	0.742	0.838	0.937	0.936
SEE	4.172	2.393	1.899	1.187	1.191

Notes: White heteroscedasticity-consistent t-statistics are reported in parenthesis. Redistribution and inherent inequality are measured in Gini coefficients from Milanovic (2000). Data for other variables are from OECD data base (Economic Outlook).

Of course, there are several reasons to be cautious about our results. Our sample is relatively small. There may be problems with measurement errors and with endogeneity of our explanatory variables. It is possible that the redistributive policy has itself caused rising inequality of market incomes (cf. Lindbeck 1997). In principle we can distinguish two ways of redistributing income, a direct one, transferring income between different individuals and an indirect one, through manipulation of equilibrium quantities and prices (wages). For example an increase in the statutory progressivity of the tax/transfer system could make members of lower-income group worse off, because it reduces their before-tax wage rates. Empirically it is not easy empirically to separate out these two effects.

Possible explanations

Optimal non-linear tax theory

The statistical association between the extent of redistribution and inherent inequality appears to be a robust one. The question is why this relationship exists. The simplest model in which incentives, inherent inequality, preferences for equity, and revenue requirement can be

integrated in a coherent framework, and which can provide a useful background for the questions we are interested in, turns out to be the Mirrlees (1971) model of optimal non-linear income taxation. In this model there is inherent inequality because individuals differ in their labour productivities. The government chooses a non-linear income tax and transfer schedule to maximize a welfare function, which is in principle sensitive to inequality, but does so with the added constraint that individuals choose their labour supply in response to the tax function. The government must also satisfy the overall budget balance constraint, with tax revenues equal to outlays. Unfortunately, however, as well recognised in the literature, closed form analytical results are few.

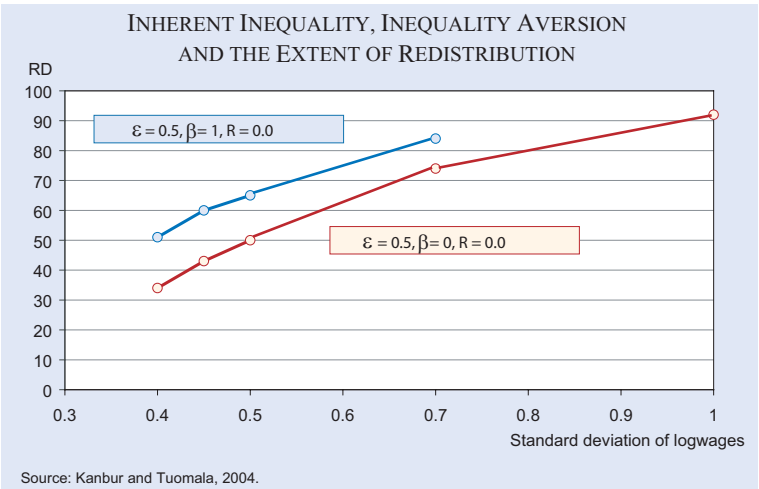
However, in the tradition of the non-linear tax theory, we can provide better understanding of the form of optimal redistribution policy through numerical simulations. With these techniques, we can compute post-tax income at each level of marginal productivities (in the sense of wage rates), and thus calculate inequality of pre- and post-tax/transfer income as well as total income, for different values of key parameters (for an exposition and discussion see Tuomala 1990 and Kanbur and Tuomala 2004). Using the Mirrlees model of optimum income taxation, Kanbur and Tuomala (1994) ask what happens to the extent and nature of the optimal degree of redistribution (i.e. redistribution which takes into account incentive effects, which in turn are based on empirically plausible labour supply estimates) when inherent inequality increases.[6] Using numerical simulations with empirically plausible estimates, the answer is that the optimum tax/transfer system becomes more progressive.

Figure 2 (from Kanbur and Tuomala 2004) summarizes the key findings on the relationship between inherent inequality, inequality aversion and the extent of redistribution. Increase in inherent inequality (standard deviation of logwages) is shown in the horizontal axis and RD, the extent of redistribution (in percentages), is shown in vertical axis. As we can see from Figure 2, the amount of redistribution increases as the inherent inequality increases. Furthermore, as the degree of inequality aversion in social welfare function (β) decreases so does the amount of redistribution, which still, however, increases as the inherent inequality increases. R is revenue requirement and ε is the elasticity of substitution between consumption and leisure.[7]

In sum, Kanbur and Tuomala (1994; 2004) show that when inherent inequality increases, the optimum income tax/transfer system becomes more progressive, taxing the better off at higher rates to support the less well off. Thus, one of the policy responses in view of inherent inequality should be a greater willingness to redistribute through the tax and transfer system. And similarly, if the inherent inequality decreases, the redistributive role of the government budget decreases.

The Mirrlees (1971) model treats differences in observed income as being due to unobserved differences in ability, which means that in his model the individual knows exactly what income he or she will receive at each possible level of effort. One might well argue that both high-income and low-income people do not owe their (un)success entirely to ability, but part of the income differentials are due to luck. The critical question is whether differ-

Figure 2



Source: Kanbur and Tuomala, 2004.

[6] Changes in the global trading and production environment can be interpreted as having increased the inherent or underlying inequality in developed countries.

[7] For example in Kanbur and Tuomala (2004) ε (= the elasticity of substitution between consumption and leisure) ranges from 0.3 to 1. Given any ε between 0.3 and 1, the optimum income tax/transfer system becomes more progressive when inherent inequality increases. The result also holds for higher values of the degree of inequality aversion in social welfare function (β) than 0 and 1as in Figure 2, including the Rawlsian case (β=∞). It is also true for different revenue requirements (R), ranging from – 0.1 to + 0.2 (as a proportion of total output).

ences in income come mostly from luck or from ability. If luck plays a substantial role in the determination of income it makes sense to have a progressive tax, creating a form of social insurance in which the lucky subsidize the unlucky. There is another strand of optimal redistribution literature (see Mirrlees 1974; Varian 1980; Tuomala 1990) that stresses the social insurance role of redistributive taxation. In this framework, an increase in variability of income would also increase the optimal degree of progressivity, because it increases the insurance value of the progressivity.

Other explanations

The prediction of ("rational") public choice theory for the size of government proposed by Meltzer and Richard (1981) is also that a greater inherent inequality should also increase the amount of redistribution. In their model increased inequality increases mean income relative to the income of the decisive voter and, thus, makes redistribution more attractive to him or her. Persson and Tabellini (1994) and Alesina and Rodrik (1994) among others incorporate versions of this result in constructing models of why greater pre-tax-and-transfer inequality is harmful for economic growth.

Perhaps most surprisingly, some authors have suggested that redistribution is greater the less inherent inequality there is (see e.g. Peltzman 1980; Persson 1995; Lindert 2000; Bjornvatn and Cappelen 2003). Peltzman's (1980) starting point was his observations that in the US greater inherent inequality seemed to lead to less redistribution. He attempts an explanation in a model in which the total support for redistribution increases if income inequality between middle and lower income groups narrow. The problem with this explanation is that because income inequality tends to increase both within group and between group inequality, a decomposition analysis of income inequality says that the net effect on redistribution is indeterminate. Bjornvatn and Cappelen (2003) argue that such a positive relationship is a result of spatial segregation among rich and poor. The more segregated societies are the less there is willingness to redistribute. Persson (1995), in turn, provides an explanation based on the notion that people care not only about the level of their own incomes but also about their incomes relative to others. Thus people neglect the envy their incomes cause others so that introducing a linear income tax with relatively little inherent inequality can yield Pareto improvement. It is not easy to see how the relationship might go in this way. Keen (1997) writes "such preferences imply, for example that the non-poor would actually gain by taking resources away from the poor and simply throwing them away". At least our empirical study does not support that redistribution is negatively correlated to inherent inequality.

Conclusions

Our finding that redistribution in OECD countries is positively associated with inherent inequality is not a new one. The point we have made here is that such a stylized fact can be explained through the Mirrlees model. If the inherent inequality increases (decreases) for any given incentive effects and the degree of espoused egalitarianism so will the society's redistributive effort.

Our empirical results are based on the assumption that the degree of espoused egalitarianism has remained constant over the period considered. There is, however, some recent individual country evidence that there could have been a shift in norms causing governments to become less willing to finance transfers and to levy progressive taxes (e.g. in the UK and Finland; see Atkinson 1999) leading to reduction in the extent of redistribution. One could argue in line with Atkinson that these kinds of changes have been episodic rather than long-term and therefore rather difficult to justify in the context of median voter models.

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