

## SOCIAL PROTECTION AND GROWTH

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## INTRODUCTION

Much discussion of social protection systems is dominated by supposed tradeoffs between the goals of growth and equity. Allusion is often made to the “affordability” of social programmes and to the effect on individual incentives to work and save. Equity, be it in terms of access to social services or the final distribution of income, is usually viewed as having a cost in terms of foregone output, which some argue is a price well worth paying, but others disagree.

This way of considering possible links between equity and growth can be misleading. Is it the distribution of income *per se* which is affecting growth, or is it the *policies* put in place to achieve an equitable distribution of income which are most important? In fact, there are plausible theories about how the distribution of income itself can affect growth, both positively and negatively, without acting through the intermediary of social protection. Once one considers *policies* designed to achieve equity goals, the permutations become even more complex. Regardless of whether the policies achieve an objective of narrowing the distribution of income (and in practice this is rarely their main objective), they can have very different effects on the allocation of resources in an economy and therefore on growth.

The purpose of this paper is to clarify the empirical evidence about what might be the tradeoffs, if any, between policies designed to achieve equity goals and growth.<sup>1</sup> The paper starts by looking at theories and existing evidence about the effects of income distribution and social protection on growth. New data sources on both income distribution and social expenditure, which have been developed by the OECD, are used to generate new estimates of these effects. These data represent a notable improvement upon those used in prior studies and permit the use of powerful panel-data estimation techniques which have proved valuable in generating insights about the impact of other government policies on growth (Bassanini and Scarpetta, 2001).

## THEORIES

The impact of greater inequality on growth is theoretically indeterminate, since it is relatively easy to think of cases where it could be either beneficial or damaging. The same can be said for social protection expenditures.

### **When might inequality be good for growth?**

In a closed economy, the greater is the amount of savings, the lower is the cost of capital and the greater is the rate of investment, and hence the greater is the rate of growth.<sup>2</sup> Because the rich have a higher savings ratio than the poor, it follows that the more unequally is national income distributed, the greater will be the aggregate savings rate, and hence the greater will be the investment and growth rate (Lewis, 1954; Kaldor, 1956, 1957; and Stiglitz, 1969). Income *redistribution* would retard growth.

Similarly, if the wage distribution is artificially condensed (*e.g.* by minimum wage legislation or centralised wage bargaining), the result is to reduce the incentive to invest in those qualifications which would qualify someone for high productivity jobs. In these circumstances, greater inequality could promote growth.

### **When might inequality be bad for growth?**

Financial markets suffer from some well-known market failures when it comes to financing investments by those without assets other than their own labour. Hence capital markets may not make funds available to poorer households even when rates of return (both private and social) are high, because there is no asset which can be reclaimed by a bank (or other financial service provider) in the event of a non-performing loan. Hence a wide income distribution may be associated with lower lending and investment than in an economy with a narrower distribution of final income, as put forward by Saint Paul and Verdier (1992), Galor and Zeira (1993) or Perotti (1993).

A wide income distribution may cause social and political unrest, which in turn discourages economic activity and investment, and hence slows growth. This line of argument has been used particularly in the case of Latin America to draw a link being between inequality and radical shifts in government policy and even in the form of government. The consequences may include support for confiscatory policies, including uncompensated land reform, excessive regulation, and even a tolerance of petty corruption. Inequality can also lead to tolerance of socially disruptive behaviour – crime, strikes, riots, but including in the most extreme form, support for insurgency, separatist movements, and tolerance of drug barons (Perotti, 1992, 1994 and 1996).

### **When might social protection be bad for growth?**

If benefit systems discourage people from working, the amount of labour supplied in the economy is lowered, so reducing the level of output and, in some circumstances, the level of capital investment and hence growth. If social provisions discourage people from saving, then unless public saving rises by an equivalent amount there is a reduction in the capital available for reinvestment. Furthermore,

the taxes necessary to finance social protection may reduce the return to innovation. The classic evocation of these arguments is that of Mirrlees (1971).

In reviewing the experience of the Scandinavian approach to social protection, Lindbeck (1975) argues that the universality of the Scandinavian welfare state has “politicised” the return to economic activity, so encouraged people to pursue material gain through the political process – by passing redistributive legislation – rather than through economic activity. The result is, over time, a loss of entrepreneurial and innovative capacity.

### **When might social protection be good for growth?**

The welfare-enhancing role of social security in a economy where annuity markets are absent (see, for instance, Hubbard and Judd, 1987) and individuals face borrowing constraints (as in Imrohorglu *et al.*, 1995) may be important. In those circumstances, a system of social security is good for overall welfare, because it enables people to get insurance against risks which the private sector finds hard to pool and manage – sickness, unemployment, etc. In addition, and of more obvious relevance to the topic of this paper, such insurance enables individuals to take more risks in their economic behaviour, because they are insured (to some extent) against failure. Assuming that there is a positive relationship between the riskiness of a project and its expected rate of return, the insurance afforded by social protection may foster growth (Ahmad *et al.*, 1991).

A number of additional considerations suggest that social protection can be good for growth. Examples of the sorts of arguments that are made include: that social protection may lead to a more cohesive society, better able to take “difficult” political and economic decisions, so promoting structural adjustment; that social protection prevents a group or class of society falling so far behind the “mainstream” that they are unable to participate in the market economy, causing permanent loss of potential output; that keeping children out of poverty may have long-term benefits on their social and intellectual development, etc. Indeed, references to social protection as being a “social investment” or “productive factor”, have become increasingly commonplace in official communiqués and statements about the objectives of social protection systems.

In practical terms, a focus on social protection as investment is particularly associated with an emphasis on “employment-oriented social policies” and altering the balance between active and passive social expenditures towards a greater emphasis on the former rather than the latter. These concepts can be defined as follows:

- *Active* policies are introduced in order to encourage increased employment by the beneficiaries of such spending.
- *Passive* policies are pure transfers of consumption from one group in society to another, either in the form of cash transfers or services.

If active measures successfully increase the quantity of labour supplied in the economy, they will promote growth. In other words, to the extent that this latter mechanism is important, the more active spending in the total of social spending, the more positive or less negative should be the effects on growth. This approach is in keeping with that of Bassanini and Scarpetta, 2001, who suggested that while there was empirical evidence for taxes being bad for growth, certain categories of public expenditure – in particular, public investment – could have positive effects.

### **How might inequality and social protection be linked**

A group of theories based around the political economy of redistribution assume that “the median voter” makes an assessment of potential gains in personal or household income from voting for redistribution.<sup>3</sup> Of course, unless income is completely evenly distributed, the median voter will always have an income less than the mean income of the country. The fact that the majority does not always vote for redistribution presumably reflects the assessment of the median voter that the costs in lost output following redistribution offset any gains in his or her personal or household income. The more that the mean exceeds the income of the median voter, however, the more likely is the voter to believe that the financial rewards from redistribution can exceed any loss of income due to reduced economic activity. If the amount of redistribution which takes place in a country is a response to the set of preferences of voters which in turn reflects the level of inequality, then the links between social protection and growth cannot be separated from the relationship between inequality and social protection. In other words, more social protection may reduce growth, but voters decided on that level of social protection because of the degree of inequality in their country.

The most widely-known empirical test of whether a wide income distribution is associated with slower growth because of policies to promote redistribution is that of Persson and Tabellini (1994). They used historical data going back to 1830 for a group of countries which subsequently became members of the OECD, and more recent data going back to 1945 for a broader range of countries. They find evidence from both groups of countries that a wider income distribution led to slower growth because voters (where voting existed) adopted policies to narrow the income distribution but which had the side effect of slowing growth. Alesina and Rodrik (1994) also argue that their estimates support this view.

Milanovic (1999) provided evidence that the wider is the distribution of income inequality *before* taxes and transfers, the greater is the extent of redistribution, as measured by the share gain and the Gini coefficient, though the effects are much smaller once pension expenditures are excluded.<sup>4</sup> Kristov and Lindert (1992) find that the bigger is the gap between the rich and the middle classes, the more redistribution

takes place, but that a wider gap between the middle and the bottom of the income distribution reduces redistribution.

### What have previous studies found?

From the mid-1980s to the mid-1990s, a number of studies found that *social protection increased* growth, including those of Cashin (1994), Castles and Dowrick (1990), Korpi (1985), McCallum and Blais (1987) and Perotti (1992, 1994). The interpretation given by Perotti emphasises the importance of imperfect capital markets and political instability. These results have been contradicted by Gwartney *et al.* (1998), Hansson and Henrekson (1994), Atkinson (1999), Nördstrom (1992) and Weede (1986, 1991). No empirical estimates separating active from passive social expenditure have been included in a growth equation. The annex summarises evidence from empirical studies of income distribution and social protection.

From the early 1990s onwards, there was a growing consensus amongst academic economists that increasing *income inequality* was bad for growth (see Perotti 1996 for a survey and more evidence). However, more recently, doubt has been cast upon some of these empirical claims. In particular, Forbes (2000) argues that the estimation techniques that were used in the first series of attempts by researchers to look at links between inequality and growth were flawed. Poor countries have wide income distributions, rich countries much less so. The earlier studies, which often used a cross-sectional OLS approach, were, in effect, asserting that narrowing the income distribution would move a country towards the richer group. But when looking at countries over time (*i.e.* using panel estimation techniques), allowing for the identification of the effects of income distribution independently of country-specific effects, Forbes found that a narrower income distribution in any one country was associated with lower, not higher growth. Much the same criticism can be made about some of those studies referred to above which claim to have identified a positive causal effect between social protection expenditure and growth. The cross-sectional association that they demonstrate, between greater social expenditure and growth, is effectively equivalent to observing that rich nations have welfare states but poor countries do not, a statement which is true but which says nothing about whether social protection causes more rapid growth.

## THE EMPIRICAL APPROACH

Although the theories underlying attempts to test empirically links between inequality, social protection and growth are sometimes complicated, in practice estimation has nearly always involved taking a simple model of the causes of growth, and augmenting it with measures of inequality and social protection. The empirical approach taken in this paper is in this tradition: it takes the most commonly-used

model of growth, and examines whether developments in social spending and income inequality might explain some of what the basic model leaves unexplained. Hence, this paper can be seen as reproducing the methodology adopted by many previous studies. However, as will be described in more detail below, this study makes use of better data than previous studies.

Most analyses of the causes of growth have used an empirical model proposed by Solow (1956) and Swan (1956) which is based on a constant returns to scale production function with two inputs: labour and capital. More recently, Mankiw, Romer and Weil (1992) – henceforth, MRW – augmented this model by adding human capital as a third factor of production. The MRW model has become the benchmark for most empirical work analysing the determinants of economic growth (Bassanini and Scarpetta, 2002), with growth in GDP per working-age population being modelled as a function of:

- The investment in physical capital (more investment means more capital assets per worker, so more growth).
- The growth rate of the working age population (more population growth means slower growth in income per capita, *given* the level of physical capital).
- The level of human capital (more human capital means greater efficiency in using physical capital).
- Income at the beginning of a period (the poorer is a country, the more rapidly is it likely to grow, because poorer countries can copy technologies from richer countries without having to develop new techniques themselves. For this reason, it is referred to as being the “catch-up” variable).

Those studies which look at the links between inequality or social protection and growth add measures of inequality or government spending on transfers as independent variables in a more or less *ad hoc* manner (Temple, 1999). Because the MRW growth model is the most common model in the empirical work on growth, its choice ensures that any differences between the empirical work of this paper and that of the majority of studies is not due to the particular specification of the underlying model. However, this study employs *panel data*, unlike many other (particularly early) studies of the links between social protection and growth. This permits greater precision in estimates and avoids some of the spurious inferences from cross-sectional correlations, referred to above.

Although this approach is widely used, it has some underlying problems. One difficulty lies in specifying the appropriate list of regressors to include in the model. From a theoretical point of view, virtually any variable which affects any part of economic activity can plausibly be argued to have an effect on growth. In practice, it is necessary to select a modest number of regressors which appear to be most important. Unfortunately, it is difficult to discern which variables are most important since growth can be found to be correlated with pretty much anything

and everything (see Sala-i-Martin, 1997a and 1997b). Consequently, it is difficult to construct a case for preferring a specification which shows that one set of variables are important over any other and there is a very real problem of omitted variable bias. This study does not make any pretence of overcoming this problem.

Furthermore, as pointed out by Caselli *et al.* (1996), most empirical studies suffer from at least one of the following estimation problems:

- Omitted variable bias may be exacerbated because the growth model includes a lagged dependent variable (the “catch-up” variable). In a dynamic specification, such as this, serial correlation in the error term – which may result from the omission of a relevant regressor – can result in unreliable coefficient estimates;
- Endogeneity is a general problem in analysis of growth since many of the determinants of growth are, in turn, arguably affected by the rate of growth (*e.g.* investment is often thought to be related to expected growth). Endogeneity may be even more of a concern when considering the effects of social protection expenditure, because the demand for social protection appears to be strongly linked with the average income level of the population (see below).

A trade-off is often encountered in seeking to minimise these potential sources of bias in the estimates. For example, most of the research trying to defeat the problems associated with omitted variables turns a blind eye to the endogeneity problem, or *vice versa*. Three main estimation techniques are used in this paper, all of which have their advantages and disadvantages.

- *Fixed Effects* models compute estimates from differences in variables within countries across time. On the assumption that individual effects are correlated over time, but are unrelated to other regressors, this corrects for endogeneity problems. Unfortunately, because lagged income enters the MRW approach, this assumption is difficult to maintain if the model is estimated using annual data. By splitting the period of analysis into ten-year sub-periods and then using sub-period average values for all variables except for the lagged dependent variable, for which *beginning* of the period values are used, serial correlation is, at the very least, much reduced (Caselli *et al.*, 1996; Forbes, 2000). However, the number of observations is also correspondingly reduced and, as pointed out by Temple (1999), omitted variable bias remains a problem.
- *The Pooled Mean Group* (PMG) approach (Pesaran *et al.*, 1999, Bassanini *et al.*, 2001) avoids averaging data, so permits much greater precision in estimates. It nevertheless limits problems of serial correlation by explicitly modelling short term dynamics (by adding first differences of the independent variables), which are allowed to vary across countries, as well as long-run effects, which

are constrained to be equal across countries. Nevertheless, omitted variable bias potentially remains an issue.

- The GMM-IV estimator (Arellano and Bond, 1991) is run in first differences and all possible lagged values of the independent variables are used as instruments. The differencing removes the omitted variable bias, and using instrumental variables corrects for the endogeneity of the explanatory variables. This makes it an attractive estimation technique when looking at the causes of growth (Caselli, 1996; Temple, 1999; Forbes, 2000). However, the approach was developed for microdata, and its theoretical foundations do assume that there is a large sample of observations. Where this is not the case (as in this study) there is a risk that the lagged dependent variable bias (leading in particular to a downward bias in estimated coefficients) is serious (Bassanini *et al.* 2001).

No single technique can guarantee to eliminate all econometric problems. As discussed in Arjona *et al.* (2001), the fixed effects estimator gave less precise results than either of the other techniques. Consequently, this paper reports estimates from the PMG and GMM-IV approaches in preference to the fixed effects estimator (though see Arjona *et al.* 2001 for a more complete set of results). More confidence can be placed in results which are consistently found using both estimators, which take such different approaches in controlling for estimation difficulties, than if only one approach gives a particular result. However, the PMG and GMM estimators both require annual data, while comparative income distribution data is only available in ten-yearly intervals. Thus, the fixed effects estimator is used when this variable is included in the model.

## DATA

The growth equation is estimated using an annual sample of 21 OECD countries running over the period 1970 to 1998. The choice of this period and set of countries reflects a trade-off between the number of countries included and the time period available. This core data-set – and indeed much of the theoretical approach underlying this study – is drawn from Bassanini *et al.* (2001).

Social expenditures are taken from the OECD social expenditure database (SOCX) which has a definition broad enough to incorporate active labour market policies and health expenditures, as well as cash income transfers and social services, including child care. SOCX permits a more detailed assessment of the effects of social policy on income distribution and growth than has been generally attempted in the past. For example, it becomes possible to identify spending on the working age population and the whole population separately, and active and passive social spending.

### Box 1. Core variables used in the empirical analysis

- *Dependent variable*: Annual average growth rate of real GDP per working-age person (aged 15 to 64), expressed in 1993 Purchasing Power Parities.

#### Baseline variables

- *Catch-up*: lagged real GDP per working-age population (aged 15 to 64), expressed in 1993 Purchasing Power Parities.
- *Investment*: real private non-residential fixed capital formation to real GDP.
- *Human capital*: average number of years of schooling of the population aged 25 to 64. This variable is drawn from the De la Fuente and Doménech (2000) dataset as adapted by Bassanini and Scarpetta (2001).
- *Population growth*: annual average rate of growth of the working-age population (aged 15 to 64).

Note: All variables come from the OECD Analytical database (ADB), unless otherwise specified.

SOCX itself covers the period 1980-1997 for all the OECD countries other than those of central Europe and the other new OECD members (Korea and Mexico). An alternative data source exists for the period 1970-1980. This data (OECD, 1994), matches relatively closely the data included in SOCX in aggregate, but does not permit a disaggregation of the data.<sup>5</sup> Because the data was collected using a different methodology from SOCX, there is a risk that it is less reliable. For that reason, when undertaking the empirical estimates described below, tests were carried out to see if excluding the 1970s affected the results. In no case did any significant variable become insignificant, or vice versa, suggesting that the long time period data can indeed be used with some confidence.

## TRENDS IN INCOME DISTRIBUTION AND TOTAL PUBLIC SOCIAL EXPENDITURE

As shown in Förster (2000) and summarised in Förster and Pearson (2002), the distribution of final income among households became more unequal in most, but by no means all, OECD countries between the mid-1980s and the mid-1990s. Over a longer time period, it is harder to discern a general trend. However, in one significant

respect, there has been a trend which is general across nearly all OECD countries: an increase in market income (*i.e.* wages and income from capital, before taxes and social benefits) inequality. This holds true regardless of whether the whole population is considered, or just those of working-age.

Since 1970, social expenditure (including health but excluding education) in OECD countries has increased by around 10 percentage points of GDP on average. This growth has not been confined to any one region of the OECD, though it has been perhaps a little less rapid in the non-European OECD countries. The European region has social expenditures which are significantly in excess of those of non-European countries. The non-European country with the highest total public social expenditure – New Zealand – has a spending to GDP ratio which is lower than all but four European countries in 1997.

Within each country or regional grouping of countries, changes in the level of social spending are positively correlated with GDP per capita (Figure 1). One way of interpreting such a relationship is that the income elasticity of demand for social expenditure exceeds unity – the richer we are, the greater the share of our income we are prepared to spend in order to protect our health, our standard of living in retirement, or our current consumption levels, were we to lose our livelihood through unemployment or sickness.<sup>6</sup> However, this relationship does not hold *across* countries or regional groupings, with expenditures in Japan and the United States,<sup>7</sup> for example, being well below the level that a European country with their level of GDP per capita would be expected to have. Nevertheless, the strong correlation between GDP per capita and social expenditure within regional groupings does suggest a need to control for reverse causality in any study of empirical effects of social expenditure on growth.

One complication in looking at the effects of social protection expenditure on growth is that countries target expenditure on quite different groups, reflecting quite explicit differences in the goals of the system. Whereas some countries place redistribution (from rich to poor, but also across different social and demographic groups) at the core of their programmes, the focus in others is on helping individuals and families redistribute their resources over their lifecycle. As a result, the aggregate amount of money which can be classified as being “social” may be a rather poor proxy for the amount of redistribution from rich to poor which is taking place. Some of the various theories described above as to how social protection might affect growth clearly are referring not so much to the aggregate amount of social expenditure, but rather to the effects of social expenditure in altering incentives. Recent OECD work on income distribution (see Förster and Pearson, 2002) has developed a measure of how much net redistribution is performed by tax/transfer systems, as indicated by the increase in the share of total income received by the bottom half of the income distribution due to taxes and transfers. Table 1 shows how this variable has changed over the time period covered in the study.

Figure 1. **Public social expenditure and GDP per capita**  
1960-97

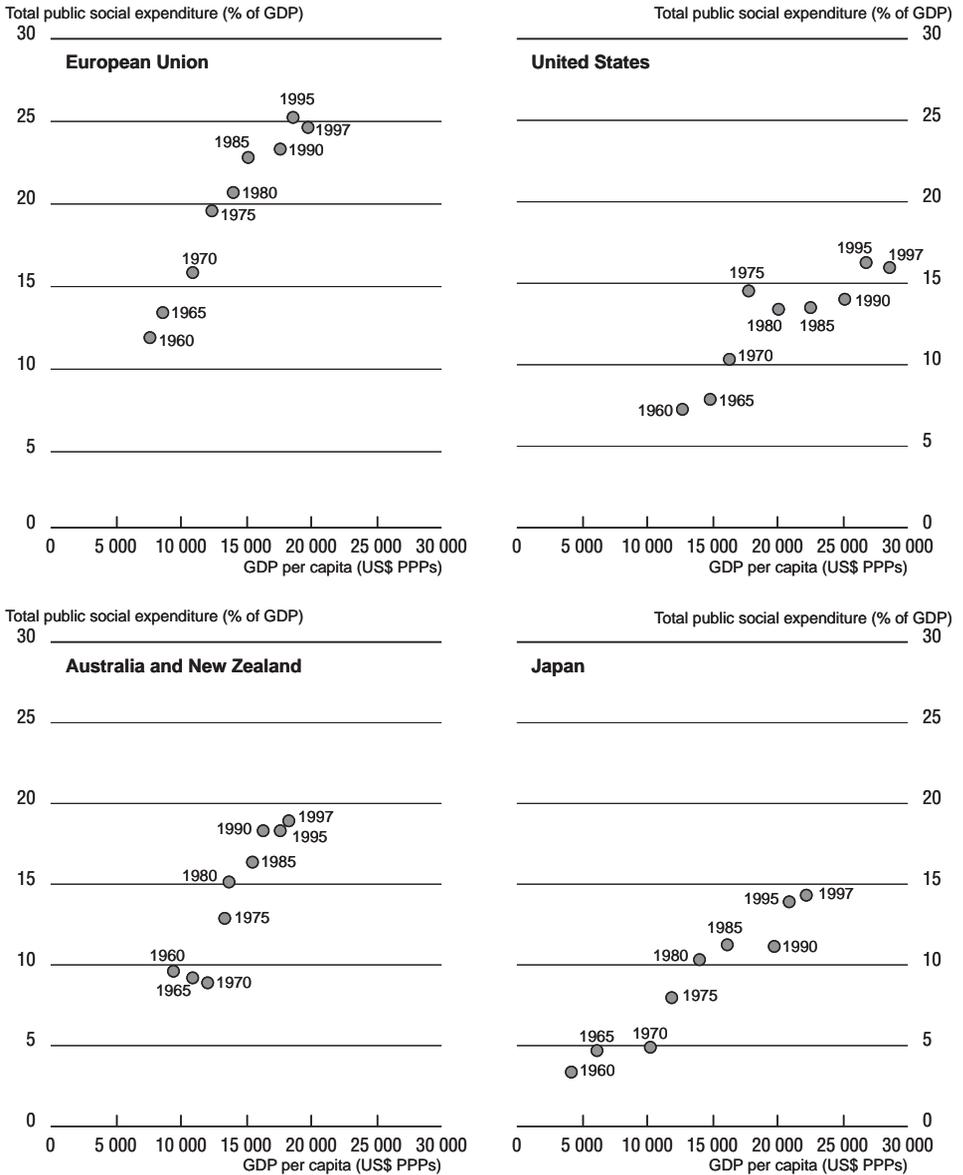


Table 1. **Share-gains of the bottom half of the income distribution**<sup>1</sup>  
Working-age population

	1970s	1980s	1990s
Australia	0.02	0.05	0.08
Belgium	..	..	0.11
Canada	0.04	0.05	0.06
Denmark	..	0.05	0.08
Finland	0.05	0.06	0.09
France	..	0.05	0.06
Germany	..	0.04	0.04
Greece	0.00	0.01	0.02
Hungary	..	0.08	0.10
Ireland	..	0.09	0.10
Italy	..	0.04	0.05
Netherlands	0.04	0.07	0.07
Norway	..	0.04	0.06
Sweden	0.06	0.05	0.08
Turkey	..	0.01	0.01
United Kingdom	0.04	0.07	0.07
United States	0.04	0.04	0.04

.. Data not available  
1. See text for definitions.  
Source: OECD questionnaire on income distribution.

As is apparent from Table 1, the changes in share gains over time have been very substantial. For example, in the 1970s, the share of *final* income of the bottom half of the distribution of incomes in the working age population was just 2 per cent more than their share of *market* income in Australia. By the 1990s, the difference was 8 per cent more. Increases (albeit, usually less rapid) have taken place in other countries. The net effect of taxes and transfers has been to redistribute more income to the lower half of the income distribution, either because more is now spent on social protection, or because benefits are more targeted than previously.

### Trends in spending on active social policies

Whilst a clear definition of social spending being either entirely active or passive is very appealing, reality is not so obliging. Most social programmes are *not* unambiguously one thing or the other. They may be mainly active, with passive elements (a labour market programme, which also provides income support and may re-qualify the recipient for unemployment insurance); they may be mainly passive, with active elements (a cash transfer programme, which has job-search requirements). As most social programmes lie between the two extremes of activity

and passivity, any classification of them into active spending or passive spending is arbitrary, to some degree.

The narrowest possible interpretation of “active” social spending is to focus on active labour market policies. These are designed, broadly, to help jobless persons find and retain paid employment. They may include training programmes; help with job-search activity; rehabilitation services for disabled workers; and wage subsidies.<sup>8</sup> Spending on active labour market programmes as a percentage of GDP remain relatively low, only recently approaching 1 per cent of GDP on average (Table 2). Expenditure is significantly higher in Nordic countries, France, Germany and New Zealand. In subsequent estimations, reference is also made to a broader measure of active social expenditure, which includes those programmes which seek to increase labour supply through reducing barriers to participation, including family support expenditures such as childcare, and also those measures which “make work pay” (Pearson and Scarpetta, 2001).<sup>9</sup> Expenditure on such policies has been on an upward trajectory, but not a particularly strong one (Arjona *et al.* 2001).

## EMPIRICAL ESTIMATES

### The baseline models

As described above, the empirical approach followed in this paper is to treat annual data for the various OECD countries as a panel data set. Before discussing the estimated effects of social protection on growth it is first worth describing how the various approaches to estimating growth equations compare with each other when the basic MRW model is estimated (and presented in the first column of the tables below). As in Bassanini and Scarpetta (2001), the PMG estimator (as used in Table 3 for example) gives statistically significant coefficients of the sign predicted by theory (positive in the case of human capital and physical investment; negative in the case of “catch-up” and population growth). Much the same is true for the GMM-IV estimates (as used in Table 5 for example), though in this case the physical investment variable is insignificant. The GMM-IV estimator also permits a number of diagnostic tests about whether serial correlation is present, and this is confirmed as not being a problem. On the other hand, the fixed-effects model with data averaged over ten year periods performs much less well (Arjona *et al.*, 2001). Although estimated coefficients have the predicted sign, and the equation overall explains a statistically-significant part of the variation in growth rates across countries and over time, only the catch-up variable is estimated sufficiently precisely to have the degree of confidence usually considered necessary. This reflects the absence of a sufficient number of observations. Accordingly, the following sections do not present estimates of the effects of social protection on growth generated using this technique.

<sup>20</sup>

Table 2. **Spending on active labour market policies, 1980-97**  
Percentage of GDP

	1980	1985 <sup>1</sup>	1990	1995	1997
Australia	..	0.4	0.3	0.8	0.5
Austria	..	0.3	0.3	0.4	0.5
Belgium	..	1.3	1.2	1.4	1.2
Canada	0.3	0.7	0.5	0.6	0.5
Czech Republic	..	..	..	0.1	0.1
Denmark	0.4	0.9	1.1	1.9	1.7
Finland	1.0	0.9	1.0	1.5	1.5
France	0.5	0.7	0.8	1.3	1.4
Germany	..	0.9	1.1	1.3	1.2
Greece	..	0.2	0.4	0.4	0.4
Iceland	..	..	..	0.1	0.1
Ireland	..	1.5	1.4	1.6	1.6
Italy	..	..	..	1.1	1.0
Japan	..	0.1	0.1	0.1	0.1
Korea	..	..	0.1	0.1	0.1
Luxembourg	0.3	0.5	0.3	0.2	0.3
Mexico	..	0.0	0.0	0.1	0.1
Netherlands	0.7	1.0	1.1	1.3	1.4
New Zealand	0.6	0.9	0.9	0.7	0.7
Norway	..	0.6	0.9	1.3	1.0
Poland	..	..	..	0.4	0.5
Portugal	..	0.4	0.6	0.8	0.7
Spain	0.2	0.3	0.9	0.8	0.6
Sweden	1.2	2.2	1.7	2.4	2.1
Switzerland	0.1	0.2	0.2	0.5	0.8
Turkey	..	0.1	0.0	0.0	0.1
United Kingdom	0.8	0.7	0.6	0.4	0.4
United States	0.2	0.1	0.2	0.2	0.2
OECD <sup>2</sup>	..	0.6	0.7	0.9	0.8
European Union <sup>3</sup>	..	0.8	0.9	1.1	1.1

.. Data not available.

1. 1986 for Portugal and Turkey; 1987 for Japan and Mexico.

2. Excluding the Czech Republic, Iceland, Italy, Korea and Poland.

3. Excluding Italy.

Source: OECD (2000).

## Social protection spending and growth

The rest of this article focuses on the hypotheses that social protection expenditure affects growth. Table 3 adds the various possible ways of measuring total social expenditure to the basic MRW model. Column (1) of the first panel gives the results for the baseline model calculated using the Pooled Mean Group

Table 3. **The effects of aggregate social expenditure on growth**  
 Dependent variable: growth rate of real GDP per working age population in 1993 PPPs

	Annual data – Pooled mean group estimations <sup>1</sup>				
	Entire population			Working age population	
	(1)	(2)	(3)	(4)	(5)
	Baseline	SOCX	(SOCX-Health)	SOCX	(SOCX-Health)
Catch-up	-0.085 [5.52]**	-0.147 [-4.14]**	-0.151 [4.36]**	-0.112 [2.25]**	-0.126 [2.35]**
Population growth	-15.505 [5.74]**	-2.834 [-2.89]**	-2.811 [2.78]**	-6.789 [9.44]**	-6.604 [8.66]**
Investment	0.200 [3.65]**	0.345 [9.54]**	0.319 [9.82]**	0.242 [6.94]**	0.256 [7.48]**
Human capital	0.857 [5.96]**	1.280 [11.66]**	1.240 [11.70]**	1.780 [23.51]**	1.723 [23.21]**
Social expenditure	- -	-0.134 [-2.57]**	-0.090 [2.14]**	-0.099 [2.52]**	-0.037 [1.56]
Constant	0.674 [5.66]**	0.981 [4.40]**	1.007 [4.60]**	0.635 [2.30]**	0.702 [2.42]**
Observations	533 (1970-1998)	533 (1970-1998)	533 (1970-1998)	340 (1980-1998)	340 (1980-1998)
Log likelihood	1 563	1 603	1 601	1 127	1 122
Countries	21	21	21	20	20

1. All PMG estimations include short-run dynamics. The figures presented in this table are the long-run coefficients.  
 Source: OECD.

estimation approach; column (2) presents the estimated coefficients when the equation is augmented by total social expenditure, column (3) shows the results using the same measure, adjusted to exclude expenditure on health. Columns (4) and (5) exclude expenditure on the elderly, where it can be separately identified, on the grounds that it might influence incentives somewhat differently from expenditures on the working age population.<sup>10</sup>

The models perform well and the basic growth model variables are individually significant with the expected sign. However, there is some instability in coefficients (*e.g.* that on population growth), which does suggest that individual results need to be interpreted with some caution. That said, the coefficient on total spending on social protection is negative and significant. If health expenditure is excluded in the measure of expenditure, the coefficient falls to two-thirds of the value found for total social spending. Excluding expenditure on the elderly also reduces the coefficients.<sup>11</sup>

The results suggest that social protection has a moderate effect on GDP in the long term. Partial elasticities suggest that an increase in spending from approximately 18.5 per cent of GDP (the mean over the whole period considered) to 19.5 per cent of

## Box 2. Income distribution and growth

The focus of the paper is on the effects of *social protection* on growth. However, one of the key purposes of social protection spending may be to reduce income inequality, making it necessary to understand whether income distribution and growth are causally linked. Table 4 shows estimates of the effects of income distribution on growth. Because of the absence of annual data, a fixed-effects model has to be used to generate estimates. The various measures of inequality\* which are added to the baseline MRW equation all have a positive coefficient, suggesting that inequality is associated with higher growth, but only in the case of the squared coefficient of variation does the coefficient approach statistical significance. However, addition of any inequality measure makes the equation highly unstable, with very large changes in the value of other coefficients and in many cases the equations as a whole become statistically insignificant. Arjona *et al.* (2001) report similar conclusions based on estimates which focus solely on the inequality of the working age population, and when looking at the distribution of *market* income inequality (*i.e.* inequality before taxes and transfers) rather than final income inequality. Finding no robust evidence of a link between inequality and growth is not the same as establishing that there is no link, of course, but given that the quality of data used in this study was significantly better than that which has generally been used in similar such studies, the absence of any significant relationship is suggestive.

Table 4. **The effects of final income distribution (entire population) on growth**  
 Dependent variable: growth rate of real GDP per working age population  
 in 1993 PPPs Ten-year periods – Fixed-effect estimations<sup>1</sup>

	(1)	(2)	(3)	(4)	(5)
	Baseline	Gini	SCV	MLD	P9/P1
Catch-up	-0.360 [2.89]**	-0.265 [1.39]	-0.224 [1.06]	-0.378 [1.11]	-0.242 [1.24]
Population growth	-0.300 [0.49]	0.486 [0.56]	0.017 [0.02]	1.174 [1.16]	0.407 [0.47]
Investment	0.039 [0.33]	0.056 [0.31]	0.015 [0.08]	0.371 [1.33]	0.040 [0.22]
Human capital	0.290 [0.94]	0.209 [0.38]	-0.070 [0.12]	0.740 [0.86]	0.221 [0.40]
Inequality	-	0.428 [1.59]	0.205 [2.12]*	0.066 [0.43]	0.288 [1.61]
Constant	3.020 [2.92]**	0.755 [0.46]	2.778 [1.58]	1.204 [0.64]	0.280 [0.16]
Observations	62	43	40	32	40
Countries	21	18	17	14	18
R-squared	0.43	0.37	0.35	0.36	0.33
F-test	7.02**	2.35+	1.93	1.47	2.37+

1. All inequality variables are after tax/transfer and include the entire population.

Source: OECD.

### Box 2. Income distribution and growth (cont.)

However, looking for a *direct* influence from income distribution on growth is not the only way in which developments in the two variables are connected. As noted above, several theorists (*e.g.* Persson and Tabellini, 1994) have argued that a narrow distribution of market income is good for growth because it reduces the demand for redistribution which is damages growth. As Rodrik (1998) says: "While equality is good for growth – if equality is inherited or as a result of historical or exogenous factors – policies that aim at achieving more equality are bad for growth".

The evidence presented in Arjona *et al.* (2001) suggests that if the Gini coefficient on market income increased from 0.42 to 0.43, the associated rise in social expenditure would eventually be of the order of 2 per cent of GDP, and this in turn is associated with lower levels of GDP. However, this is not strong evidence in favour of the arguments outlined above, as other interpretations of the results are possible. In particular, more social expenditure may *substitute* for market income. For example, if there is a reasonably generous publicly-provided pension, individuals will not accumulate private wealth to finance their retirement (see OECD, 1998, 2000a). Similarly, high rates of benefit payments may cause behaviour to change which leads to fewer people in work. In each case, market income inequality will increase.

\* Inequality can be measured in a number of different ways, each of which can be interpreted as giving different weights to different parts of the income distribution. For example, the Gini coefficient is more sensitive to the middle of the distribution; the SCV to both ends of the distribution, and the MLD to the bottom of the distribution.

GDP would reduce GDP in the long term by 0.7 per cent.<sup>12</sup> This can be compared with the effects of other variables on GDP: a 1 per cent of GDP increase in investment would increase GDP by 1.3 per cent; and an increase of one year in the average years of schooling in the working-age population would increase long-run GDP by over 6 percentage.<sup>13</sup>

One way of interpreting these results is that the effect on growth is not from social protection *per se*, but from taxation. In other words, as social protection spending increases, so does taxation, and it is taxation which reduces growth, rather than social expenditure reducing growth directly. There are a number of studies which have looked at the effects of taxation on growth. Generally, they find that the tax to GDP ratio negatively affects output – more taxation, less growth

(see, for example, Bassanini *et al.*, 2001), though of course in any particular case the effects of taxes on growth depend on their initial level and on how they are levied.

Yet even if there were *no* effects on output from social expenditure, but the financing of social expenditure reduced growth, it would still be reasonable to assert that the social expenditure *caused* the increase in taxation and reduction in growth, as increased social spending accounts for most (if not all) of the increase in tax pressure in OECD countries since the mid 1960s. In other words, it is just as likely that the studies which find an effect from taxation on growth may in fact be picking up an effect from social protection expenditure as *vice versa* – because it is not possible to have social protection expenditure without an assumption of increased taxation either now or in the future, it is not really possible to separate a tax effect from a social expenditure effect.<sup>14</sup>

Evidence is inconclusive about whether it is the level of social expenditure or the amount of redistribution which might have the greatest effects on growth. Arjona *et al.* (2001) tested whether a measure of net redistribution – the share-gain of the bottom half of the income distribution, both in general and when looking just at the working-age population – had a significant effect on growth.<sup>15</sup> Because income distribution data is only available at decade-wide intervals, the model had to be estimated using the fixed-effects regression technique on a sample of ten-year periods. Although the signs on the share-gain variables were negative – as would be expected were redistribution to harm growth – diagnostic tests reject the hypothesis that the coefficients explain a statistically significant amount of the variation in growth rates across time and countries, regardless of whether including the share-gain for the working-age or the entire population. Furthermore, it is not entirely possible to separate the effects of social protection expenditure on growth from the interactions between income distribution and growth. Box 2 contains some discussion of this difficult area.

### Active and passive social expenditure

The hypothesis tested in this section is that some part of social expenditure, broadly conforming to the “active” definition outlined above can be defined and found to have a statistically different effect on growth from other forms of social expenditure.

One form of active social spending – active labour market policies – can only be identified in the OECD SOCX database for the period 1984-1997. Column 2 of Table 5 includes both active (the narrow ALMP definition) and non-active (total social spending minus ALMP) variables as regressors in the same regression. In addition, GMM-IV estimation is also used in columns 3 and 4.

There is a positive significant coefficient for active social spending and a negative significant coefficient for non-active spending in column 2. The sensitivity of

Table 5. **The effects of active social policies on growth**  
 Dependent variable: growth rate of real GDP per working age population in 1993 PPPs

	Annual data – Pooled Mean Group estimations <sup>1</sup>				GMM-IV estimations	
	(1)	(2)	(2a)	(2b)	(3)	(4)
	Baseline	Active and non-active	Active and non-active (2, excluding spending on elderly)	Active and non-active (2b excluding health)	Baseline	Active and non-active
Catch-up	-0.220 [2.54]**	-0.299 [4.44]**	-0.316 [4.33]**	-0.335 [4.27]**	-0.150 [29.00]**	-0.241 [4.08]**
Population growth	4.056 [6.53]**	3.230 [4.91]**	3.969 [5.83]**	4.264 [5.51]**	-0.565 [7.02]**	-0.623 [4.26]**
Investment	0.202 [9.00]**	0.151 [6.28]**	0.211 [8.47]**	0.160 [6.18]**	-0.002 [0.14]	-0.046 [0.71]
Human capital	1.647 [20.62]**	2.468 [32.91]**	2.547 [32.10]**	2.266 [33.60]**	0.256 [3.42]**	0.618 [1.41]
Active spending	-	0.065 [10.00]**	0.078 [10.57]**	0.067 [8.77]**	-	0.018 [2.07]**
Non-active spending	-	-0.426 [13.06]**	-0.351 [12.81]**	-0.249 [12.80]**	-	-0.103 [2.21]**
Constant	1.315 [2.56]**	1.554 [4.52]**	1.398 [4.35]**	1.617 [4.29]**		
Observations	204 (1984-1997)	204 (1984-1997)	204 (1984-1997)	204 (1984-1997)	518 (1970-1998)	244 (1980-1997)
Log likelihood	688	613	610	605		
Wald-test					99.52**	72.18**
Sargan test					20.69	17.35
m2 statistic					-3.051**	-0.934
Countries	17	17	17	17	21	19

1. PMG estimations of models (1) – (3) include short-run dynamics. The long-run coefficients are reported in this table. Model (4) is estimated as a partial adjustment model.

2. Total social spending-active spending including ALMPs.

Source: OECD.

these results to different definitions of non-active spending are explored in columns 2a and 2b. The coefficient on active spending remains unchanged in sign, level and significance. Excluding spending on cash transfers to the elderly reduces the negative coefficient on non-active spending, and also excluding health spending reduces it even further. However, it remains significant. The reliability of these results is confirmed by estimating the same model specifications using the GMM-IV technique (column 4).<sup>16</sup> A positive significant coefficient is obtained for active spending, and a negative significant coefficient on other social spending.

The most reasonable interpretation of the estimates is that not only are the effects of the two sorts of spending significantly different, they have significant effects in the opposite direction to each other. More *passive* spending may be associated with a poor growth performance, but more *active* spending is associated with higher output. This result appears broadly to be supported by the two different econometric techniques used (which take a different approach to dealing with the various statistical problems).

The estimates suggest that increasing active spending from 0.63 per cent of GDP (the average over the period and countries covered) to 0.73 per cent of GDP would increase long run GDP by nearly 1 per cent. The “passive” estimate (in reality, total social spending minus active spending) suggests that an increase from 20.7 to 20.8 per cent of GDP would reduce long run GDP by 0.2 per cent. The effect of active spending on GDP in particular seems very large. Much caution needs to be used when interpreting results which are so dramatic, and factors such as diminishing marginal returns to additional active spending have to be taken very seriously when attempting to use such figures to draw policy conclusions.

Evaluations of ALMPs have given “mixed” results about their effectiveness in promoting employment (*e.g.* Martin, 2000). Do these results provide evidence that in fact the ALMPs have been effective? The answer depends on what is meant by “effective”. What is found is that increased spending on active policies increases output. If increased employment were to be the mechanism by which active spending promoted growth, it might be expected that there would be a clear impact on intermediate variables. For example, the employment to population ratio might be expected to rise in the presence of a high rate of “active” spending. Existing microeconomic evidence on the effectiveness of ALMPs suggest that it would be surprising were such an impact of active social spending on labour force participation rates to be found.

There may be alternative explanations of why such a high parameter is found on the “active” spending variable. For example, high active spending may be an indicator that a government has undertaken other growth-enhancing reforms and what is being identified may not be so much an effect from active spending, but rather the impact of an entire policy stance. Alternatively, it is possible that active policies may be relatively ineffective in creating net increases in employment for those who benefit from them, but relatively effective in increasing effective labour supply by keeping groups at the margin of the labour market in touch with the world of work, with more general beneficial effects on growth rates. Unfortunately, it is not possible to prove or disprove such hypotheses with the aggregated data utilised in this study. The most reasonable interpretation of the results is that this study provides some evidence that active spending might be good for growth, but that further evidence is required before such an assertion can be made with confidence.

## CONCLUSIONS

Recent decades have witnessed important changes in income distribution and social expenditures in OECD countries. When looking at income distribution data, the most striking fact is that there has been an increase in market income inequality (almost) everywhere in the OECD. Partly as a result of efforts to limit changes in the final income distribution, there has been a long-run trend towards greater social expenditure, lasting at least up until the early 1990s. However, since then any growth in social expenditure as a percentage of GDP appears to have stabilised.

These changes in income distribution and social protection expenditures are not trivial. This paper has had as its goal the objective of evaluating whether there was any evidence that these changes altered the rate of growth in the economy.

This study found no evidence that the level of income inequality affects GDP one way or another. By contrast, the balance of evidence is that more social protection expenditure reduces output, although the effect is not large. In interpreting this result, the suggestion that different sorts of social expenditure have different effects on growth proves to be important. The estimates in this study suggest that more “active” spending (*i.e.* social spending which attempts to change the distribution of market income by promoting the labour market participation of part of the population that would have lower-than-normal market incomes) is associated with higher growth, whereas other social spending is associated with lower growth.

These findings were obtained by applying the best statistical methods identified in previous studies to superior data, including the most reliable data on OECD countries which are available not just on social protection and income distribution, but also on investment, GDP growth and human capital investment. This makes them the best available estimates of the impacts of inequality and social expenditures on growth, but does not necessarily make them good. In particular, it is not possible to say whether these findings are subject to serious omitted variable bias. The models estimated here exclude a number of potentially important influences on growth, for example, indicators of entrepreneurial environment, innovation, quality of education, R&D, macro-economic stability, openness to trade, geographical position, religious affiliation, etc. The tentative conclusions given above are based on estimates which do not take into account all these other factors that we think might be important.

Finally, it should be noted that the estimates presented here are of the effects of *marginal* changes. To the extent that the estimates presented are considered reliable,

they suggest that a bit more active spending is likely to be good for growth, and a bit more passive spending bad for growth. It cannot be concluded that, say, a doubling of active spending would still be good for growth and a halving of passive spending still bad for growth. Common-sense suggests that the former might well result in wasteful spending, and the latter lead to political instability due to resentment at an “unfair” distribution of final income.

## NOTES

1. This paper summarises some of the main results from a longer study conducted by the authors, Arjona *et al.* (2001).
2. The increase in the growth rate due to a higher savings rate is only temporary in the basic neo-classical growth model (Swan, 1956, Solow, 1956), but can be permanent in some other formulations (Romer, 1986, 1990).
3. In many economic models of democracy, the behaviour of the median voter is the key in determining government policy.
4. These results are consistent with the theoretical findings of Tabellini (2000) and Casamatta *et al.* (2000), among others, in which the greater the inequality of pre-tax income within each generation (and the proportion of elderly people in the population), the larger the size of social security expenditures.
5. It does not, however, include data for Iceland, Luxembourg, Portugal, Spain or Turkey, or any of the new OECD member countries (the Czech Republic, Hungary, Korea, Mexico, Poland, Slovakia).
6. There are other possible explanations. Because a significant part of social expenditure relates to services which are not traded internationally, Baumol or Balassa-Samuelson effects may be significant. As productivity increases in the provision of public services are limited, but wages must match those in the traded sector, an ever greater proportion of GDP must be devoted to maintaining a given level of social services.
7. Spending in Japan and the United States tends to be lower than the European average in each of the main categories of spending – on cash transfers to the elderly, unemployment, disability, etc.
8. This may be the narrowest possible definition, but even so it is not without problems. As noted by Martin, (2000), some active measures are really passive ones in disguise.
9. There is no generally-accepted definition of make work pay policies. Furthermore, many of them are delivered via the tax system, rather than the benefit system. This complicates the generation of a making work pay expenditure variable. As a result of only partially being able to overcome these problems, the measure used probably underestimates the expenditures or revenues forgone in countries which deliver making-work pay transfers to the employer via payroll tax reductions.
10. These models have also been estimated on a sample excluding the 1990s, reflecting the fact that the baseline model gives much less satisfactory results when the 1990s are included, and on a sample excluding the 1970s, in recognition of the fact that data from the 1970s comes from a slightly different data source and might not be as reliable. The results obtained over either of the shorter periods were generally not significantly different from those obtained over the long period time periods (Arjona *et al.* 2001).

11. The GMM-IV estimation approach (which should be effective in overcoming endogeneity problems) was also used to test the effects of social expenditure on growth. However, diagnostic statistics suggest that there may be serial correlation, so the GMM results are unreliable in this particular case and are not presented.
12. A 1 percentage point increase in spending takes several years to have its full-scale impact on GDP, during which time the growth rate is temporarily increased.
13. The results in this paragraph are obtained from the estimates of total social spending estimated over the full time period, using the PMG model. All effects are calculated at the mean.
14. Regardless of which interpretation is correct, including a measure of tax pressure in the equation does not alter the interpretation or the coefficient on social expenditure, and that on tax pressure is insignificant (Arjona *et al.*, 2001).
15. These variables capture how the income share of the bottom half of the distribution of market income increases due to taxes and transfers. In computing these share gains, it is necessary to define them across the same set of people.
16. The model is well specified and both tests for serial correlation (the Sargan test and the m2 statistic) indicate its absence.

*Annex.* **Studies on the link between economic growth, income inequality and social protection**

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Alesina and Rodrik (1994)	Period: 1960-1985 and 1970-1985. Method: OLS and 2SLS. Samples: High-quality and low quality samples, 46 and 70 countries. Includes OECD countries and developing countries <i>Sources:</i> some existing data sets, see Fields (1993).	Average per capita growth rate of GDP over the period 1960-1985.	Per capita GDP level in 1960. Primary school enrolment rates in 1960. Gini coefficient of income inequality, in 1960. Gini coefficient of land distribution in 1960. Democracy dummy.	The more unequal the distribution of resources is, the lower is the rate of economic growth. This link is explained by redistributive politics. Significant and negative coefficients are obtained for both Gini variables.
Cashin (1994)	Period: 1971-88 (sub-periods 71-75, 76-80, 81-85). Method: Time-series cross-section estimation using OLS and GIV with one-factor error structure for panel estimation (group dummy variables). Sample: 92 country observations, on 23 developed countries. <i>Data sources:</i> IFS, World Tables, GFS, Summers and Heston and OECD LFS data.	Rate of growth of real GDP per worker.	Average value of change in the stock of public capital as a share of GDP. Natural logarithm of real GDP per worker in 1985 prices. Average rate of social security and welfare expenditure to GDP. Average rate of secondary school enrolment. Average value of each sup-period's current revenue. Average share of total population over 65. Average level of GDP of each sub-period. Average value of each sub-period's interest rate. Average value of CPI in each sub-period.	Increased government spending on those items which enter private production functions enhances economic growth. Example of such spending include transfer payments and public investment. Both of these generate positive externalities raising private investment and growth. Positive and significant coefficients on social security spending. Positive and borderline significant on public investment.
Castles and Dowrick (1990)	Period: 1960-1985 Method: Pooled time-series cross-section. OLS (endogeneity is tested) Sample: 18 OECD countries. <i>Sources:</i> OECD <i>Historical Statistics</i> and <i>National Accounts</i> .	Real per capita GDP.	OECD social expenditure (excluding health and education)	Positive coefficients but not significant (if controlling). With no control: irregular signs and not-significant.

## Annex. Studies on the link between economic growth, income inequality and social protection (cont.)

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Devarajan <i>et al.</i> (1993)	Period: 1970-1990. Method: OLS. Sample: 69 countries. Sources: IMF GFS.	Moving average of per capita real GDP.	Continental dummy variables. Current net of interest public expenditure over total expenditure. Capital expenditure over total expenditure. Defence expenditure over total expenditure. Health expenditure over total expenditure. Education expenditure over total expenditure. Transportation and communication expenditure over total expenditure. Premium in the parallel market for foreign exchange. Terms of trade, interest rate shocks.	Investigating the relationship between the composition of public expenditure and growth, the authors claimed that a change in the policy mix in favour of productive activities can lead to a higher rate of growth of the economy. The results explained, however, that only current expenditure and some categories of health and education expenditure seemed to play a relevant role, with positive and significant coefficients.
Easterly and Rebelo (1993)	Period: 1970-88 (and 1870-1988). Method: OLS. Cross-section regressions. Sample: 125 (28 countries for the historical estimation), including developed and developing. Sources: Summers and Heston (1991), Barro and Wolf (1989), GFS, IFS and Easterly <i>et al.</i> (1993).	Growth rate of per capita GDP. Ratio of private investment to GDP	Government expenditure in agriculture, education, health, housing, infrastructure, industry. All as a share of GDP. Investment by general government and public enterprises. Marginal income tax rate. 1960: GDP per capita, primary enrolment and secondary education enrolment rates. 1970-1985: assassinations per million, revolution and coups, war casualties per capita. Ratio of individual income to personal income. Ratio of domestic taxes over (consumption and investment).	1) The share of public investment in infrastructure is correlated with growth. 2) Budget surplus is also correlated with growth and investment. 3) The link between most other fiscal variables and growth is statistically fragile. 4) High levels of income inequality prior to 1970 were associated with higher levels of public spending in education 70-88.
Gwartney, Lawson and Holcombe (1998)	Period: 1960-1996 and 1980-1995. Method: OLS regression. Sample: 23 OECD countries. Sources: OECD <i>Historical Statistics</i> and OECD <i>Economic Outlook</i> .	Investment as share of GDP Annual rate of growth real GDP	Share of government expenditure in GDP at the beginning of period and change in government expenditure during the period Investment as a percentage of GDP Property rights* Standard deviation of the inflation rate Change in years of schooling 80-95* *: controls for pooled OECD and developing sample	Excessively large government expenditure has reduced economic growth. There is a strong negative relationship between: 1) size of government and GDP growth and, 2) increases in government expenditure and GDP growth.

*Annex. Studies on the link between economic growth, income inequality and social protection (cont.)*

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Hansson and Henrekson (1994)	Period: 1970-87. Method: Cross-country and cross-industry OLS, controlling for investment and employment. Sample: 14 OECD countries. <i>Sources:</i> OECD <i>Historical Statistics</i> .	Real private output in 14 industries.	OECD social security transfers/GDP	Negative and significant effect for sub-period 1965-82.
Keefer and Knack (1995a)	Period: 1960-1985. Method: OLS. Sample: developing countries.	Gini. Land Gini. Income of the 3rd quintile of the income distribution.	GDP shares of social security, welfare, government transfers, taxes, expenditures and consumption. Share of public employment.	Consistent signs but generally not significant for the relationships between Gini coefficients or -O3 and redistribution.
Keefer and Knack (1995b)	Period: 1960-1985. Method: OLS. Sample: developing countries. <i>Sources:</i> Data from International Country Risk Guide (ICRG) and the Business Environmental Risk Intelligence (BERI).	GDP growth 1960-1985. Average ratio of real private investment to GDP over the period 1970-85.	Initial GDP level in 1960. Secondary and primary school enrolment rates in 1960. Share of government consumption in GDP. Frequencies of coups and assassinations. Magnitude of deviation of SH investment deflator from mean.	Property rights are found to have a larger impact on investment and growth than has previously been found. Rates of convergence to US level incomes increase when property rights are included in the regressions.
Korpi (1985)	Period: 1950-73. Method: Time series and cross-section estimated by unweighted OLS measuring total effects and controlling for the share of agricultural labour force. Sample: 17 OECD countries. <i>Sources:</i> ILO Social Expenditure.	Real per capita GDP	ILO Social expenditure/GDP	Positive and significant coefficients.

## Annex. Studies on the link between economic growth, income inequality and social protection (cont.)

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Kristov and Lindert (1992)	Period: 1960-1981. Method: Pooled time-series and cross-section. OLS (with Prais-Winsten transformation) and GLS (analysis of the simultaneity bias). Sample: 19 OECD countries. Sources: OECD <i>Historical Statistics</i> , OECD <i>Labour Force Statistics</i> , Summers and Heston (1988), OECD <i>National Accounts</i> .	Social transfers (pensions and other social transfers) over GDP	Logarithm of the unemployment rate Logarithm of the share of population aged 65+ Logarithm of real GDP per capita Logarithm of CPI over GDP deflator. Logarithm of change in direct taxes over GDP. Growth rate of GDP per capita. Logarithm ratio of top quintile to middle quintile income. Logarithm ratio of middle quintile to lower quintile income.	The elasticities of real per capita GDP are significant and positive (government spending is a luxury good). Higher rates of growth weaken the will to help the poor (displays a negative and significant coefficient). Age structure and unemployment affect social transfers (significant and positive coefficients). Price-elastic demand for real social transfers (coefficient less than unity but bigger than zero). Progressive transfers are raised by a wider income gap between top and middle and lowered by a wider gap between middle and low. Pension spending is reduced by a widening of distance between top and middle.
Landau (1985)	Period: 1952-76. Method: Pooled time series and cross-section. Estimated using IV corrected for heteroskedasticity. Sample: 16 OECD countries. Sources: OECD <i>National Accounts</i> .	Real per capita GDP growth	Government Transfers/GDP.	Positive but non-significant effects, whether using OLS or IV and regardless of including population weights or not.
Lindert (1996)	Period: 1960-1981. Method: OLS. Sample: 19 OECD countries. Sources: OECD Social Expenditure database, IMF GFS and OECD <i>National Accounts</i> .	Logarithm of the ratio of 5th to 3rd quintile of the income distribution. Logarithm of the ratio of 3rd to 1st quintile of the income distribution.	Shares in GDP of social security expenditure, welfare, unemployment, health and total transfers.	Consistent and mostly significant relationship for the tax/transfer variables and consistent sign. "The dead-weight costs of spending, and the taxes behind it, fail to show the predicted upward spiral." The further the middle pre-fisc income ranks from the poor, the lower the political tendency to spend on any major type of social programme.
McCallum and Blais (1987)	Period: 1960-83. Method: OLS. Pooled time-series and cross-section analysis. Sample: 17 OECD countries. Sources: OECD <i>Historical Statistics</i> . Method: IV with controls for employment growth.	Real GDP	OECD Social Security Transfers/GDP	Positive and significant coefficients.

*Annex. Studies on the link between economic growth, income inequality and social protection (cont.)*

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Milanovic (1999)	Period: Four 'waves' of data, mid-70s, mid-80s, early 90s and late 90s. Sample: 24 democracies and 79 observations. Method: OLS. Sources: LIS data-set.	Share of the bottom half in the income distribution. Share of the bottom quintile in the income distribution. Share of total disposable income received by the bottom half or bottom 20 per cent. Gini coefficient. Middle class gain generated by moving from factor to disposable income. Using: factor income, factor P income (factor income plus pension transfers), disposable income.	Gini for factor incomes. Share of persons older than 65. Share of total factor income received by the 5th and 6th decile of the population.	Greater <i>factor</i> inequality is associated with greater gains of the poor and the very poor, through more redistribution. The age variable is not significant. The Gini coefficient has the expected sign and is significant. Depending on the sample used, the gains may be fairly large for the very poor. Redistribution fully compensates for the differences which might exist between the countries at the factor income level. It is greater in societies starting from a more unequal position. The effects of redistribution become less important if pensions are taken out of transfers and treated as factor income. There is no evidence that the median-voter hypothesis describes collective choice.
Nördstrom (1992)	Period: 1979-89. Method: Modelling the total effect using OLS. Cross section. Sample: 14 OECD countries. Sources: OECD <i>National Accounts</i> .	Real GDP growth	Other current transfers item in OECD <i>National Accounts</i> .	Negative and significant coefficients for different specifications.
Perotti (1992)	Period: 1960-85 and 1970-85. Sample: 72 countries. Method: OLS two-equation model in which the endogenous variables are investment and a variable of socio-political instability. Krasker-Welsch robust estimates for 1970-1985. 3SLS for 1970-85. 2SLS for 1970-85. Sources: Alesina-Rodrik and Persson-Tabellini data-sets.	GDP growth, 60-75 and 60-85. Ratio of real private domestic investment to real GDP. Ratio of gross real public investment to real GDP. Nominal government transfer payments as ratio to nominal GDP.	GDP. Primary and secondary school enrolment rates. Share of third and fifth quintiles of the population. Deviation of PPP value from sample mean. Urban population as share of total. Share of population older than 65. Number of revolutions and coups per year. Number of government crises per year. Dummy: government is made up of coalition. Number of political demonstrations against the government. Number of political strikes. Index of political stability.	Government transfers seem to have a positive effect on growth. This finding, obtained by estimating a structural model complements the work of Devarajan <i>et al.</i> (1993) and Sala-i-Martin (1992). Income inequality fuels social discontent, increasing socio-political instability, uncertainty in the politico-economic environment and reduces investment and economic growth. Income inequality and economic growth are inversely related. Socio-political instability is measured using a composite index of political unrest.

## Annex. Studies on the link between economic growth, income inequality and social protection (cont.)

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Perotti (1994)	Period: 1960-85 and 1970-85. Sample: 72 countries. Method: OLS and 2SLS. Sources: Alesina-Rodrik and Persson-Tabellini data-sets.	Investment to GDP ratio. Share of government transfers in GDP. Measure of socio-political instability.	Degree of imperfection of capital markets (loan-to-value payment of mortgages in 1960). A measure of equality in the distribution of income in 1960 (share of two bottom quintiles). Primary school enrolment ratio. Deviation of PPP from sample mean. Number of revolutions and coups. Investment to GDP ratio. Share of government transfers in GDP. GDP. Share of 65+ over total population.	The results cast doubts on the empirical validity of the endogenous fiscal policy explanation of the relation between income distribution and investment, while the imperfect capital market approach and the political instability explanation receive more convincing support. There is a positive relationship between redistribution and economic growth, sometimes significant. Political instability has a negative and significant effect on investment. When the share of the middle class increases, so does investment (a positive and significant coefficient is found).
Perotti (1996)	Period: 1960-1985. Sample: 67 countries. Method: OLS, Krasker-Welsch robust estimates, WLS, 2SLS and IV. Sources: Perotti (1992, 1994), Persson and Tabellini (1994), Gastil (various years) and Barro and Lee (1993).	Average yearly growth of GDP per capita. Average marginal tax between 1970-1985. Socio-political instability. Net fertility rate, average of 1965 and 1985 values. Female secondary school enrolment ratio.	Share in income of the 3rd and 4th quintiles, 1960. Share in income of the 3rd quintile, in 1960. GDP per capita in 1960. Average years of secondary schooling, in 1960. PPP value of the investment deflator, relative to US, in 1960. Average share of government expenditure on SS, W health and housing, education in GDP, 70-85. Labour taxation, income taxation in GDP. Average marginal tax rate. Urbanisation rate. Share of population older than 65. Education enrolment ratios. Net fertility rate. Life expectancy at birth. Share of population belonging to an ethnic group.	Strong empirical support linking income distribution to socio-political instability and to the education/fertility decision. Borrowing constraints and investment in human capital also received support by the data. There is less support for explanations on the effects of income distribution on fiscal policy.

*Annex. Studies on the link between economic growth, income inequality and social protection (cont.)*

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Persson and Tabellini (1994)	Period: 1960-1985. Sample: cross section of 13 OECD countries. Method: total effect is measured using unweighted IV estimation. <i>Sources:</i> OECD Social Expenditure series.	Real per capita GDP growth	OECD Social Expenditure over GDP (transfers are measured as the sum of pension payments, unemployment benefits/compensation and other social expenditure)	Negative non-significant coefficients.
Sala-i-Martin (1992)	Sample: 74 countries. Method: OLS. <i>Source:</i> Summers and Heston.	Average annual growth rate of per capita GDP taken from Summers and Heston.	Logarithm of initial per capita GDP. Public investment as a share of GDP. Public transfers (share of social security expenditure over GDP). Investment share in GDP.	Positive and significant coefficient of the regression of growth on public transfers and investment. Transfers to the poor, minimum wages, minimum working-age requirements and other types of public welfare serve to keep workers possessing low human capital out of the labour force.
Vanhoudt (1997)	Period: 1985 (to 1991 when possible). Sample: 13 to 15 countries OECD countries (depending on the dependent variable chosen). Method: OLS cross-section regressions. <i>Sources:</i> Deininger and Squire's (1996) dataset on inequality, the Penn World Tables (PWT5.6), OECD <i>Science and Technology Indicators</i> , OECD <i>Job Study</i> , and OECD <i>Employment Outlook</i> .	Log of Gini. Log of quintile 1's income share Log of quintile 5's income share Log of quintile 5's to 1's income share	Log of average investment share in physical capital, 65-91. Log of average investment share in R&D, 75-85. Log of average growth rate of labour force, 85-91. Log of average share of GDP financing ALMPs, 85-91. Log of average share of GDP financing PLMPs, 85-91. Log of average share of GDP (ALMPs + PLMPs). Percentage change in tax wedge, 85-91.	Spending on LMPs does not have a significant effect on the Gini coefficient but it does affect other measures of inequality. Spending on ALMPs significantly improves the income share at the bottom at the expense of the top. The tax wedge has a significant effect on inequality in all the estimated regressions.
Weede (1986)	Period: 1960-1982. Sample: OECD. Method: pooled time series and cross-section. OLS. Total effect, controlling for share of labour force in agriculture. <i>Sources:</i> OECD <i>Historical Statistics</i> .	Real GDP. Real per capita GDP.	OECD social security transfers/GDP.	Negative coefficients with strong effects.

*Annex. Studies on the link between economic growth, income inequality and social protection (cont.)*

Authors	Period, method, sample and data sources	Dependent variables	Independent variables	Results
Weede (1991)	Period: 1960-1985. Sample: 19 OECD countries. Method: pooled time series and cross-section. Total effect, controlling for share of labour force in agriculture and length of democratic period. OLS. <i>Sources: OECD Historical Statistics.</i>	Real GDP Per capita GDP Per worker GDP	OECD social security transfers/GDP.	Relatively strong negative effects.

*Source:* OECD.

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