Growth, Inequality and Social Protection

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Cet article entreprend de clarifier les relations qui peuvent exister entre l'équité et la croissance. Nous constatons : (1) qu'il n'y a pas de preuves suffisantes pour conclure avec certitude que l'inégalité est bonne ou mauvaise pour la croissance, bien que les résultats observés ne puissent nous permettre d'éliminer totalement la possibilité qu'elle ait un effet sur la croissance; (2) que l'augmentation des dépenses destinées à la protection sociale nuit à la croissance; (3) que les programmes actifs en matière de dépenses sociales, établis pour encourager chez les bénéficiaires une recrudescence d'activité dans leur travail, sont bons pour la croissance, tandis que les programmes passifs lui sont nocifs. Cependant, étant donné que les votants veulent à la fois l'équité et la croissance, la conclusion quant à la politique à adopter n'est pas de réduire les dépenses sociales pour augmenter la croissance, mais plutôt de concentrer les efforts, non pas sur les programmes passifs mais sur les programmes actifs. Cette politique est également soutenue par une interprétation différente des résultats, à savoir que la réduction des transferts encourage l'entrée dans le marché du travail, ce qui résulte à la fois en une augmentation de la croissance et un rétrécissement de la distribution des revenus.

This paper attempts to clarify what trade-offs might exist between equity and growth. It is found that (i) there is not enough evidence to state definitively that inequality is either good or bad for growth, although the results cannot be taken so confidently as to rule out completely any effect; and (ii) increased social protection expenditure is bad for growth; although (iii) active social spending programs, which are designed to encourage increased employment activity by the beneficiaries, are good for growth while passive programs are bad for growth. However, since voters want both equity and growth the policy conclusion is not to cut social expenditures to boost growth but rather to shift the focus from passive to active programs. This is also supported by a different interpretation of the results, that cutting transfers encourages entry into the labour market, both increasing growth and narrowing the income distribution.

INTRODUCTION

Implicitly or explicitly, much discussion of social protection systems is dominated by supposed trade-offs between the goals of growth and equity. Allusion is often made to the "affordability" of social programs 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 which others resist.

This way of considering possible links between equity and growth can be misleading. For a start, even if we consider only one dimension of equity — the distribution of income — it is often very confusing about whether it is the distribution of income

per se which is affecting growth, or whether it is the *policies* put in place to achieve an equitable distribution of income. 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. Furthermore, unless growth benefits all equiproportionally (an implausibly strong assumption), then growth will itself affect the distribution of income.

Once one considers *policies* designed to achieve equity goals, the permutations become even more complex. Regardless of whether the policies achieve their objective of narrowing the distribution of income, they can have very different effects on the allocation of resources in an economy and therefore on growth. Furthermore, there is good reason to think that demand for certain types of social protection is strongly linked to the level of income per capita, and hence to growth.

The purpose of this paper is to present the findings of Arjona, Ladaique and Pearson (2001). This study was undertaken as part of the Organisation for Economic Co-operation and Development (OECD) horizontal project on growth, and attempted to clarify what might be the trade-offs, if any, between equity and growth objectives, and between policies designed to achieve equity goals and growth. This paper is structured into six sections.

The first section describes the approach taken: to take the most commonly-used way of explaining differences in growth rates across countries and over time, and to see whether social protection and income inequality have any effects over and above the "standard" causes.

The next four sections take four key issues in turn. First, does the income distribution affect growth? Second, does social expenditure affect growth? Third, does active social spending affect growth differently from passive social spending? Fourth, what are the links between market income inequality and

social expenditure? In each case, the theories that have been developed to look at these issues are described, the results of previous empirical studies (if there are any) are summarized, the data used described and econometric estimates reported. The final section concludes.

THE APPROACH

The Strategy
A plausible case can be made that inequality is good for growth, promoting savings and rewarding effort; equally, a case can be made for it being bad for growth, denying resources to those who need them in order to take advantage of market opportunities, leading to social and political unrest which may call existing property rights into question and discouraging growth-enhancing policy changes. Similarly with social protection: high taxes and support for those who do not work or save are cited as reasons why growth may be inhibited. On the other hand, social expenditure may help people find work, increase their skills, and improve their health, promoting growth.[1]

Reasonable people probably accept that there is something in all these theories. Where they differ in opinion is in their relative importance. Without empirical evidence, it is impossible to talk of effects of income distribution and social protection on growth as if even the *direction* of any effects of income distribution and social protection can be known *a priori*.

The empirical approach taken by Arjona, Ladaique and Pearson (2001) and discussed here is to take the most commonly-used way of analyzing growth, and to see whether developments in the distribution of social spending and income inequality might explain some of what the basic model leaves unexplained. The paper does *not* develop any new theoretical approaches to the problem *nor* does it use new econometric techniques. Rather, the paper attempts to identify more clearly whether each

theory requires a measure of market income distribution or final income distribution, of the entire population or just of the working-age population, of social expenditure in general or social expenditure on the working-age population, of active social spending or passive social spending, and in each case to use new data which has just become available from previous OECD projects on income distribution and social expenditure.

This approach has been possible because although the theories underlying attempts to empirically test 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 a measure of inequality and social protection. Hence, although this paper does not have a series of formal equations which lead to a hypothesis that can be tested empirically, it is consistent with any number of theories that have previously been proposed. This paper can be seen as reproducing many of these previous studies, but with better (or more refined) data.

Furthermore, a variety of econometric techniques are used, reflecting limitations in the data and attempts to overcome problems intrinsic to empirical estimations of the causes of growth in general and social protection in particular. To the extent that different estimation techniques deal with different potential problems, if they come up with similar results, so does it become possible to be more confident about whether the results are robust, rather than being statistical artifacts.

The Growth Model

Most analyses of the causes of growth have used an empirical model proposed by Solow (1956) and Swan (1956). More recently, as analysts have become more aware of the importance of human capital, this model has been "augmented," with human capital treated as a factor of production in its own right, as suggested by Mankiw, Romer and Weil (1992) and it is this approach that has become the

benchmark for most empirical work analyzing the determinants of economic growth. Studies that follow this approach are derived from a constant returns-to-scale production function with labour, capital and human capital. The result is that growth in gross domestic product (GDP) per working-age population is seen as being a function of the following:[2]

- the income at the beginning of a period (the poorer the country, the more rapidly it is 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.);

- the investment in physical capital (more investment means more capital assets per worker, so more growth);

- the level of human capital (more human capital means greater efficiency in using physical capital); and

- the growth rate of the working-age population (more population growth means slower growth in income per capita, *given* the level of physical capital. Hence this is *not* the same as saying a higher rate of fertility or migration is bad for growth, as long as physical capital rises accordingly.)

This framework is usually augmented by adding whatever other variables are thought to be missing from this basic approach to growth. Consequently, those studies that 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), although some studies do derive formal justifications for what they are doing from first principles. Because the Mankiw *et al.* 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.

Figure 1 provides a brief description of the core variables used in the empirical analysis. This growth equation is estimated using an annual sample of 21 OECD countries running over the period 1970 to 1998.[3] 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 dataset — and indeed much of the theoretical approach underlying this study — is drawn from Bassanini *et al.* (2001).

Problems in Estimation and Solutions
Although this approach is widely used, there are some underlying problems which have not yet been resolved. These are briefly summarized here.[4] First, the generality of conclusions: Sala-i-Martin

(1997*a,b*) has argued that since growth is the sum of the change in all economic activity, anything that affects any part of economic activity can plausibly be argued to have an effect on growth, making it difficult to build a case for preferring one set of variables to another. Second, endogeneity: related to the above point, since everything can be said to affect growth it can be difficult to disentangle effects (see Casell, Esquivel and Lefort 1996). For example, low growth may lead to higher unemployment and therefore to higher social spending, but this higher social spending has not "caused" the low growth.

Third, incompleteness: not *everything* that might matter can be put into an equation at once; yet making omissions can cause the statistical basis upon which estimates are made to fall apart. And finally, incomplete or inappropriate data: often only summary measures of final income distribution have been used in empirical evaluations. Further,

FIGURE 1
Core Variables Used in the Empirical Analysis

Dependent Variable
Annual average growth rate of real GDP per working-age population (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.

Population Growth
Annual average rate of growth of the working-age population (aged 15 to 64).

Notes: All variables come from the OECD Analytical database, unless otherwise specified.

*GDP measures market activity. It does not measure the welfare of countries, and there are numerous reasons why trends in GDP per capita may depart from welfare per capita, including, for example, the time spent in activities such as caring for children and older people.

spending on a large variety of social programs is subsumed under the heading "social protection."

INCOME DISTRIBUTION AND GROWTH

Theories

This section considers the various ways in which the distribution of income might affect the growth rate. There are a number of theories which are based around the idea of there being a link between the amount of social expenditure determined through the political process and the distribution of income, with the idea being that some distributions cause more social expenditure, in turn affecting growth, than others. A discussion of these theories is held over until the next section.

When Might Inequality Be Good for Growth?

The most straightforward of these theories, pioneered by Lewis (1954), Kaldor (1956, 1957) and Stiglitz (1969), is to note that, in a closed economy, the greater the savings, the lower the cost of capital and the greater the rate of investment, hence (at least temporarily in a neo-classical model, permanently in some other formulations) the greater the rate of growth. Because the rich have a higher savings ratio than the poor, it follows that the more unequally national income is distributed, the greater will be the aggregate savings rate, and hence the greater will be the investment and growth rate. Income redistribution would retard growth unless governments took additional steps to ensure that investment remained high.[5]

High income inequality may also encourage factors of production to be used more efficiently. The larger the difference in returns to working in different occupations, the more might people seek those qualifications that let them work in high-productivity jobs with high wage rates.

When Might Inequality Be Bad for Growth?

The role of the capital markets is also at the centre of a different group of theories which look at links between income distribution and growth. Some theorists argue that financial markets suffer from market failure 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. This may be particularly true of investment in human capital, where there is no asset that 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).

The second theory that has received some attention recently (e.g., Rodrik 1997) is to suppose that growth can be increased or retarded through pieces of legislation which nevertheless are not directly in the immediate interests of some part of the voting population. For example, there may well be clearcut net gains from opening an economy to trade, but those who have been working in activities that are no longer viable because of foreign competition, or even who find that their skills are no longer valued, are clear losers from such a policy. They may be able to put together sufficient political strength to block the introduction of such policies. This theory does not address the income distribution directly. The losers from a particular policy may be found throughout the income distribution. However, in practice it is those who have few marketable skills and little capital who find it harder to adjust to job loss, so those who are least likely to benefit directly from market openings are likely to be those with low incomes. A wide income distribution may also cause social and political unrest, which in turn discourages economic activity and investment, and hence slows growth. The work of Perotti (1992, 1994, 1996) has been particularly important in this area.

What Have Previous Studies Found?

From the early 1990s onwards, there was a growing consensus amongst academic economists that

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 ordinary least squares (OLS) approach, were, in effect, asserting that narrowing the income distribution would move a country toward 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.

Trends in Income Distribution

The theories described above about the effects of income distribution on growth suggest that different aspects of the distribution of income might be important: to the extent that it is the aggregate level of savings that affects growth, and savings in turn are expected to rise the greater the inequality of income, the variable that needs to be tested is (changes in) the final income distribution of the whole population. To the extent that the argument is about the ability of those low-income households to make investments in their human capital, it is most likely to be found among the working-age population (on the assumption that the retirement-age population is not likely to be investing in their human capital, at least for the purposes of generating market income[6]). If the argument is instead that a wide income distribution leads the population to vote against growth-enhancing policies or in favour of policies that might adversely affect growth, the variable that needs to be tested is the income distribution of the whole population prior to taxes and transfers.

This section therefore describes the trends in both the market and final income distribution. It draws heavily on the recent OECD study of income distribution trends (see Förster 2000).

One of the great dilemmas in looking at income distribution is that there is no unique measure that does not implicitly involve value judgements when comparing the incomes of one person against another. The most commonly-used measure — the Gini coefficient — is particularly sensitive to changes in the middle of the income distribution. Yet the discussion of theories above suggests that changes at the extremes of the distributions are likely to be more important for growth: it seems unlikely that changes in the middle of the distribution should lead to big changes in savings rates, for example, and if either the capital market constraints argument or the social disruption arguments are important, a measure more sensitive to changes at the bottom of the distribution may be more appropriate. For that reason, four measures of inequality are used in the regression analysis.[7]

Overall, there has been no clear general trend in total income in OECD countries. In the ten countries for which a relatively long time period can be considered, from the mid-1970s to the mid-1990s, there are four countries where the income distribution widened, three countries where it narrowed, and it remained stable in the remaining three. However, there *are* signs of a more general trend across OECD countries in more recent times. From the mid-1980s to the mid-1990s inequalities decreased slightly in four of the 20 countries for which data are available, remained stable in another five, but increased in the other 11 countries, in half of them by considerable amounts.[8]

Trends in, and indeed levels of income inequality *before* taxes and transfers are not as familiar to most people as changes in final income distribution, and they differ markedly. Overall, there is much *less* variation in market incomes across countries than there is in final incomes. There is not, for example, much difference in the market income distributions of Sweden and the United States. There is, however, a general trend in the distribution of market income within the population as a whole, and it is toward greater inequality.

Notwithstanding one or two differences, trends in the income distribution of the working-age population are not hugely different from that of the entire population. Market income of the working-age population, however, has polarized to an even greater extent than when looking at the whole population. The polarization of market income has been particularly sharp in the Nordic countries, no doubt reflecting the loss of employment of people at the bottom of the income distribution, as discussed by Förster (2000) in more detail.

Empirical Results

This section tests the hypothesis that the income distribution affects growth. By comparing the results from regressions including the various measures of income inequality outlined above with results from the basic model outlined in the first section, two things can be inferred. First, does adding income inequality help us "explain" more of the changes in growth across countries and over time? Second, does a wider income distribution increase or reduce growth rates? Figure 2 describes the income inequality variables used.[9]

The Effects of Final Income Distribution

Constrained by the availability of data on inequality — just three points in time for some countries, only two for others, reflecting the situation at the middle of each of the last three decades — it is not possible to use annual data on growth, investment, etc. when looking for the effects of final income distribution on growth. Instead, ten-year-period averages of the rest of the variables in the annual

FIGURE 2
Income Inequality Variables

The income distribution variables used in this study come from the *OECD Questionnaire on Trends in Income Distribution and Poverty* described in Förster (2000). Data were provided by national experts using the same income concept across countries. Variables are available before and after taxes and transfers (market versus final income distribution). Income has to be adjusted to take account of family size by assuming an equivalence scale of 0.5. Precise definitions are given in Förster (2000). Several alternative measures of inequality were tested as follows.

Gini Coefficient
A statistical measure that has a value of zero if every person in the economy has the same amount of income, and one if one person had all the income, and everybody else had no income at all.

Mean Log Deviation
The average of the log difference between the arithmetic mean of disposable income per equivalent household member and the disposable income of each household member.

Squared Coefficient of Variation
The variance of the disposable income of individuals divided by the squared arithmetic mean of disposable income per equivalent household member.

Ratio of the Ninth to the First Decile
The ratio of the (upper bound value of the) ninth income decile to the (upper bound value) of the first income decile.

These indices have different ranges. All indices have a lower bound of zero but the upper bound is unity only for the Gini index: it is infinity for the SCV and (1+log(100))log(mean) for the MLD. Changes of similar magnitude can then indicate different changes in the degree of inequality depending on the indicator used. In addition, each index differs in its sensitivity to changes in income at various points on the income distribution.

sample are constructed. When data are of this form, the best estimation technique to use is known as the fixed effects model (see Arjona, Ladaique and Pearson 2001 for discussion of this model).

According to the above-mentioned argument put forward by Lewis (1954), Kaldor (1956), and Stiglitz (1969) more final income inequality should be "good" for economic growth. Because the elderly save as well as the working-age population, if there were any such effect, then it would be most likely to have shown up in our econometric results. Yet the results were not supportive of the theory, because the variables taken as a whole explained no more than a small proportion of the variation in growth rates across countries and time. The theory underlying the Galor and Zeira (1993) argument is that the poor cannot borrow and invest because of credit-market imperfections. Because those who have retired from the labour market are unlikely to wish to undertake growth-enhancing human capital investment, this theory is best tested using measures of the income distribution of the working-age population. Again, however, the results were so poor that there is no evidence for or against such an hypothesis. Although no theory in particular suggests that *market* income distributions should affect growth, the results were not much more satisfactory. Whilst market income inequality does just manage to be significant when measured by the Gini coefficient and by the mean log deviation, the estimates as a whole remain poor and unconvincing.

Hence it is possible to conclude that there is no evidence in support of any income distribution being either good or bad for growth, despite using the most appropriate econometric techniques and the most comparable income distribution data for OECD countries, which is available for a reasonably long time period.

However, saying that there is "no evidence" is not quite the same as saying that there is "no effect" of income distribution on growth. There are two reasons why our results may have failed to show

a significant effect on growth. First, the econometric technique which has to be used because of the nature of the data — the fixed effects model — risks underestimating any effect.

The second problem is more subtle. The Kaldor-type model suggests that a wider income distribution will lead to more savings and hence investment, promoting growth. However, as the estimates already have investment as a variable, all that the income distribution variable might be picking up is any effect *additional* to that which is already embodied in the investment variable. Similarly with the Galor/Zeira-type model. A wider income distribution is suggested to reduce investment in human capital, but there already is a measure of human capital in the equation: the average years of schooling of the working-age population. So again, it might be that no effect is showing up from income distribution because the baseline model already has the effect embodied within it. Various tests were tried to see if this second hypothesis might be true, but the data do not show any pattern consistent with such an effect.

A more extreme way of testing for endogeneity is, however, to drop the variable in question. If either investment or human capital is dropped, then inequality becomes borderline significant at the 10 percent level. If both are dropped at the same time, then inequality becomes comfortably significant at the 10 percent level. Taking these results at face value, it becomes just about possible to conclude that income inequality is good for growth.[10] However, although this approach of dropping variables certainly solves the endogeneity problem, it leaves a very obvious "omitted variable" bias. It is, after all, difficult to imagine that inequality explains more than a small proportion of investment or human capital.

As mentioned above, these estimates should be interpreted as falling between the two extremes of short term and very long term. If inequality affects labour supply, savings or the general efficiency with

which resources are allocated, then such effects should show up in the estimates. But there may well be other reasons underlying the changes in the income distribution, and these may take longer before they become evident in the data. A widening of income inequality may, for instance, improve the allocation of resources in the economy, and promote growth in the short term, but this may harm growth in the longer term, through one or other of the mechanisms described in the first part of this section. Overall, we do not find any evidence that suggests that a wider income distribution is either good or bad for growth, but nor can we be so confident in the results that we can conclude that there is in fact no such effect.

SOCIAL PROTECTION AND GROWTH

Theories

When Might Social Protection Be Bad for Growth?

The previous section discussed how income distribution might affect growth. It might be inferred then that social protection might affect growth through altering the distribution of income, but this is implicit in the theories, not explicit.

There are, however, several groups of theories that do directly relate social protection and growth. The most familiar just refer to the potential for a trade-off between equity and efficiency in systems of social protection. If benefit systems discourage people from working, the amount of labour supplied in the economy is cut, thus reducing the level of output and, in some circumstances, the level of capital investment and hence growth. There are many more such examples which could be given, with perhaps the classic evocation of the problem being that of Mirrlees (1971).[11]

In reviewing the experience of the Scandinavian approach to social protection, Lindbeck (1975) suggested a link between social protection and growth which appears at first sight to be a variant of the equity/efficiency trade-off, but which when pursued in greater depth, turns out to depend on quite a different mechanism. His argument is that the universality of the Scandinavian welfare state has politicized the return to economic activity, thus encouraging 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 idea that social protection can be good for growth is reflected in a series of official statements at the national or multinational level. 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; and that keeping children out of poverty may have long-term benefits on their social and intellectual development, etc. Often referred to as social investments, or treating social protection as being a productive factor, such sentiments have become increasingly commonplace in official communiqués and statements about the objectives of social protection systems.

Furthermore, the welfare-enhancing role of social security in an economy where annuity markets are absent (see, for instance, Hubbard and Judd 1987) and individuals face borrowing constraints (as in Imrohoroglu, Imrohoroglu and Jones 1995) may be important. In those circumstances, a system of social security is good for overall welfare, carrying out a dual function: first, promoting efficiency whilst substituting for the missing markets, and second, encouraging individuals to be less risk averse in insuring them against risks that would otherwise remain uncovered. In addition to better management

of individual risks, systems of social protection can also help in the more efficient administration of societal risks. This may foster investment and ultimately growth (Ahmad *et al.* 1991).

What Have Previous Studies Found?
Previous studies that have found that social protection *increases* growth include Cashin (1994), Castles and Dowrick (1990), Korpi (1985), McCallum and Blais (1987), and Perotti (1992, 1994). Most of these studies have datasets dominated by less-developed countries. These results have been contradicted by Gwartney, Lawson and Holcombe (1998), Hansson and Henrekson (1994); Nördstrom (1992), and Weede (1986, 1991).

Trends in Total Public Social Expenditure
Since 1970, social expenditure (including health, but excluding education) in OECD countries has increased by around ten percentage points of GDP on average (data are presented fully in Arjona, Ladaique and Pearson 2001). This growth has not been confined to any one region of the OECD; it has been perhaps a little less rapid in the non-European OECD countries, but not to any significant extent. 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. One way of interpreting such a relationship is that social expenditure shows a positive income elasticity of demand — the richer we are, the more 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. However, this relationship does not hold *across* countries or regional groupings, with expenditures in Japan and the United States, for example, being well below

the level that a European country with their level of GDP per capita would be expected to have.[12] Nevertheless, the strong correlation between GDP per capita and social expenditure within regional groupings does suggest a need to control for endogeneity in any study of empirical effects of social expenditure and growth.

Trends in Spending on the Elderly
A distinction between expenditure on the elderly and that on the rest of the population is useful, because spending on the elderly is unlikely to affect incentives to supply labour as much as cash income transfers to the working-age population. Population aging has led to strains on systems of public income support for the retired population in a number of (particularly European) OECD countries (OECD 1998, 2000*b*).

Nevertheless, spending on the elderly shows no particular trend toward becoming a more important element in total social spending. Spending on the younger population has increased at a similar rate (on average) to that on the retirement-age population. Unemployment benefits, although only a small element in total social expenditure, doubled as a percentage of GDP between 1980 and the early 1990s. Furthermore, health expenditure has increased steadily. Understanding the role played by public health expenditure in the various theories about social protection and growth requires a consideration of whether it is best considered a redistribution from the rich and healthy to the sick and poor, or whether it promotes a healthy labour force and promotes labour supply, an issue which is considered in the fourth section.

Trends in Redistribution
Much social expenditure is "churned" — people pay taxes at the same time as receiving benefits. The aggregate amount of money that can be classified as being social may be a rather poor proxy for the amount of redistribution from rich to poor that is taking place. The OECD work on income distribution has developed a measure of how much net

redistribution is performed by tax/transfer systems that can be used when assessing theories about growth and social protection: the increase in the share of total income received by the bottom half of the income distribution due to taxes and transfers.

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 was just 2 percent more than their share of *market* income in Australia. By the 1990s, the difference was 8 percent 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 spent, or because benefits are more targeted than previously.

Interpreting the Results

As with the discussion of income distribution above, two hypotheses were considered: first, does including a measure of spending on social protection help us explain more of differences in growth rates across countries and over time, and second, is the effect of

more social spending positive or negative? Figure 3 provides definitions and sources of the variables used. Arjona, Ladaique and Pearson (2001) explain the pooled mean group (PMG) regression technique used and the results obtained.

Taken at face value, the data are consistent with the theoretical argument put forward by Mirrlees that social expenditure reduces growth, and is inconsistent with the idea that social expenditure, taken as a whole, was an investment that had a positive impact on growth rates. The results do not give evidence in favour of the hypothesis that spending on the elderly has a lesser or no effect on growth. On the contrary, estimates that focus only on the working-age population are less well-defined and apparently smaller than when spending on the whole population is included.

The results suggest that social protection has a moderate effect on growth in the long term — it is not a negligible effect, but it is by no means a driving force in growth rates. Partial elasticities suggest that an increase in spending from approximately

FIGURE 3
Social Expenditure Variables

These variables come from the *OECD Social Expenditure database* (SOCX), 2000, and the *OECD Questionnaire on Trends in Income Distribution and Poverty* described in Förster (2000), respectively.

- *Social spending* is the provision by public institutions of benefits to, and financial contributions targeted at, households and individuals in order to provide support during circumstances that adversely affect their welfare, provided that the provision of the benefits and financial contributions constitutes neither a direct payment for a particular good or service nor an individual contract or transfer. Such benefits can be cash transfers, or can be the direct (in-kind) provision of goods and services (see OECD 1996). Because of data limitations (see Adema 1999), the variable used here is limited to *public* social expenditure, i.e., the expenditure must be made by an institution that is classified as being general government in the system of national accounts.

- *Share gains*: the share gain for a given decile is defined as the increase in the income share of that decile as transfers take place. These variables capture how the income share of the bottom half and of the bottom quintile of the distribution of market income for the working-age population increase as redistribution takes place, that is, as tax/transfers have effect. In computing these share gains, it is necessary to define them across the same set of people. The variable used below reflects the share gain of the bottom 50 percent of the income distribution.

18.5 percent of GDP (the mean over the whole pe-riod considered) to 19.5 percent of GDP would reduce GDP in the long term by 0.7 percent.[13] This can be compared with the effects of other variables on GDP: a 1 percent of GDP increase in investment would increase GDP by 1.3 percent; increasing the initial level of GDP by $1,000 per person would reduce eventual GDP by 0.6 percent, and an increase of half of one year in the average years of schooling in the working-age population would increase long-run GDP by over six percentage points.[14]

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 pro-tection spending increases, taxation has to rise, and it is taxation that affects (reduces, according to these estimates) 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 growth (see e.g., Bassanini, Scarpetta and Hemmings 2001).

Such an interpretation implies that it is reason-able to consider the effects of social spending as being somehow separable from the financing of so-cial expenditure. However, including a measure of tax pressure in the equation does not alter the coefficient on social expenditure.[15] Overall, therefore, there is evidence that is consistent with the argument that more social expenditure is associated with lower growth. Further, it is the aggregate amount of expenditure that appears to matter: no evidence was found in favour of the idea that it is redistribution, rather than expendi-ture, which may have an effect on growth.

THE EFFECTS OF ACTIVE AND PASSIVE SOCIAL SPENDING ON GROWTH

Theories and Evidence
The previous section considered the effects of so-cial protection expenditure as a whole on growth. Social expenditure consists of somewhere between

one-half and three-fifths of total government spend-ing in OECD countries and accounts for up to 30 percent of GDP. But it is not a homogeneous mass, including as it does expenditures ranging from cash income support to the unemployed to capital invest-ment in the health-care sector. It is reasonable to consider whether different sorts of social spending might affect growth differently.

SOCX permits a distinction to be made between different types of spending. In particular, it is use-ful to make a distinction between active and passive spending: *active* policies are introduced in order to encourage increased employment by the benefici-aries of such spending and *passive* policies are pure transfers of consumption from one group in society to another, either in the form of cash transfers or services. This distinction is potentially important because the two types of expenditure may have dif-ferent effects on income equality measures:

- *Active* policies can be expected to reduce both *market* income inequality and *final* income inequality.

- *Passive* policies have complex effects on mar-ket income inequality. If nobody changes their behaviour when such programs are introduced, market income inequality will be unaffected. If, however, they do cause behavioural changes (people work less, or save less) then they will widen market income inequality. Whether final income inequality is reduced or not depends on whether the taxes and transfers offset the wid-ening, if any, in the market income distribution.

Furthermore, they may also have different effects on growth. The previous section identified some cir-cumstances when passive social spending could be good for growth. Active policies may be beneficial in all these circumstances, but in addition they can also increase the quantity of labour supplied in the economy, so promoting 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.

Health spending is clearly not all active or passive according to the definitions outlined above. There have been some attempts to determine whether health status and health spending affect growth rates. For example, Bhargava *et al.* (2000) find that increased health status is associated with more rapid growth. Devarajan, Swaroop and Zou (1993) also found that some categories of health and education spending promoted growth. However, these studies, as with most others in this field, focus on developing countries, where improvements in health status are much more likely to be felt amongst those of working age than in the OECD area, where improvements in morbidity and mortality are more likely to be in the retired population.

No empirical estimates separating active from passive social expenditure have been included in growth equations. However, Vanhoudt (1997) found that spending on active labour market policies was effective in raising the income levels of the lowest quintile, but did not affect the Gini coefficient. Martin (2000) surveys the extensive literature on the effectiveness of active labour market programs in increasing employment, finding that there were positive experiences for some groups and types of spending, but not for others.

Trends in Spending on Active Social Policies
Unfortunately, whilst a clear definition of social spending programs being either entirely active or passive is very appealing, reality is not so obliging. They may be mainly active, with passive elements (a labour market program, which also provides income support and may requalify the recipient for unemployment insurance); they may be mainly passive, with active elements (a cash transfer program, which has job-search requirements). As most social programs lie between the two extremes of activity and passivity, any classification of them into active spending or passive spending is arbitrary.

For the purposes of looking at the effects of social spending on growth, this failure to generate a clear and clean distribution of social spending into active and passive categories is not *that* important. After all, the objective is not to rank countries by their active effort, but rather to see if different compositions of expenditure can affect growth. To that extent, it is reasonable to test a variety of definitions of active and passive, in order to see which, if any, of them appear to influence growth (or more accurately, to influence growth in a different manner to the rest of social expenditure).

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 programs; help with job-search activity; rehabilitation services for disabled workers; and wage subsidies.[16] Spending on active labour market programs as a percentage of GDP has been on an upwards trajectory, but the levels remain relatively low, only recently approaching 1 percent of GDP on average. It is significantly higher in Nordic countries, France, Germany, and New Zealand.

A broader interpretation of active social spending might include those programs that seek to increase labour supply through reducing barriers to participation in the formal labour market. This would suggest that in addition to spending on active labour market policies, two other items of expenditure should be included. First are those payments made to low-income households who nevertheless do have earnings. Schemes such as the Earned Income Tax Credit in the United States, the Working Families Tax Credit (formerly Family Credit, formerly Family Income Supplement) in the United Kingdom, and the Family Income Supplement in Ireland are all designed to "make work pay" by supplementing family incomes with payments from government. Second, expenditures on family care, and child care in particular, may reduce the costs of parents going to work, so increasing (particularly female) labour supply.

As with active labour market programs, there has been an upward trend in spending on family services and make-work-pay policies. Spending on family services in European countries, particularly Nordic countries, has been high throughout the period. The growth in such spending in the United States and the United Kingdom reflects the increase in spending on make-work-pay policies.

In addition to the intrinsic benefits of reducing sickness and promoting health, health expenditure also ensures that a greater percentage of the population will be available for work by preventing sickness, reducing the intensity of symptoms, and ensuring that people get well quickly. Obviously, not all health expenditure can be seen as being likely to have an effect on growth. Perhaps 40 percent or even more of health-care expenditure is spent on treating older persons.

There has been an increase in spending on health, though it has hardly been dramatic since 1980, amounting, on average, to just 0.6 percentage points of GDP. Much more rapid increases have been experienced in Belgium, France, Germany, the United States, Switzerland, and Portugal. Declines in health expenditure as a percentage of GDP have taken place in several countries.

Interpreting the Results

The hypothesis being tested was that active spending had a significantly different impact on growth than passive 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 actually good for growth. This result appears broadly to be supported by the two different econometric techniques used (which correct for different sorts of statistical problems and are described along with the detailed results in Arjona, Ladaique and Pearson 2001).

Active spending, which has this effect, includes at least active labour market policy spending, spending on family services, and spending on make-work-pay policies. This does *not* mean that all other expenditure is bad for growth. It is not possible, in general, to break-down expenditures within programs into an active or passive component so there may well be items of expenditure in many different social expenditure fields that have a positive effect on growth.

It is not clear which items of non-active expenditure are particularly associated with low growth. This is somewhat surprising and perhaps justifies some caution when drawing policy conclusions.

It follows that the correct interpretation of these results is *not* that *only* expenditures on active labour market policies, policies to make work pay, and family services are good for growth. Rather, it is that where it is possible to identify active spending, it seems to have a positive effect on growth, and that this is supportive of efforts to combine other sorts of social expenditure, particularly cash transfers, with efforts to promote employment.

The estimates suggest that increasing active spending from 0.63 percent of GDP (the average over the period and countries covered) to 0.73 percent of GDP would increase long-run GDP by nearly 1 percent of GDP. The passive estimate (in reality, total social spending minus active spending) suggests that an increase from 20.7 to 20.8 percent of GDP would reduce long-run GDP by 0.2 percent of GDP. The effect of active spending on GDP in particular seems very large. Much caution needs to be used when interpreting results that 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.[17]

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. What is being identified may not be so much an effect from active spending, but rather the impact of an entire policy stance.[18] Such hypotheses are difficult to prove or disprove. 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.

LINKS BETWEEN INCOME INEQUALITY AND REDISTRIBUTION

Previous sections have found no evidence that income distribution affects growth, that social expenditure in general is associated with lower growth, but some social expenditure has a positive effect on growth. However, social expenditure alters the income distribution. This section stops treating social expenditure and income distribution as if they were entirely unrelated, and examines whether the manner in which they are linked can affect growth.

Theories

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. In economic models of democracy, the behaviour of the median voter is the key in determining government policy. 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. Hence, Persson and Tabellini (1994) and Alesina and Rodrik (1994), among others, suggest that the greater is inequality as measured by the difference between mean and median incomes, the greater the level of political action to redistribute funds.

Previous sections have used the inequality and social protection variables as if they were "choice" variables. It is as if a dictator of each country had chosen to have such-and-such a level of inequality, and/or this-or-that level of social protection expenditure. If in reality the amount of redistribution that takes place in a country is not some philosophical choice based on a set of first principles, but rather is a response to the set of preferences of voters, which in turn reflects the level of inequality and the rate of growth of the economy, then the links between social protection and growth cannot be separated from the relationship between growth, 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 level of growth and 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 find evidence over long historical periods that a wider income distribution led to slower growth because voters (where voting existed) adopted policies to narrow the income distribution but this had the side effect of slowing growth.

Milanovic (1999) provided evidence that the wider the distribution of income inequality *before* taxes and transfers, the greater 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.[19] Kristov,

Lindert and McClelland (1992) find that the bigger 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.

Interpreting the Results

In light of the earlier results showing that social expenditure can reduce growth, the hypothesis tested was whether social expenditure itself depended on market income inequality and the rate of growth. The results show that the data are consistent with (but do not prove the validity of) the argument that a wider market income distribution leads to more redistribution, which in turn reduces growth. Details on the specific estimation techniques and results are found in Arjona, Ladaique and Pearson (2001).

In particular, the coefficients on the parameters suggest 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 percent of GDP. On the other hand, if a country grows 0.1 percent of GDP more rapidly every year than previously, the eventual level of social spending will be over 2.5 percent of GDP lower than it otherwise would have been. And finally, each 1 percent increase in social expenditure as a percentage of GDP is associated with a reduction in eventual GDP per working-age population of 0.6 percent (a similar order of magnitude to the estimates made using the PMG technique reported earlier).

The traditional argument is that labour supply is enhanced by such spending, so directly affecting growth. In addition, the estimates reported here suggest that if such active spending is effective, the distribution of market income is narrowed, so reducing the demand for redistribution. Increased active spending *indirectly* promotes growth by reducing the demand for redistribution to offset an unacceptably wide distribution of market income.

The consequences of this interpretation of the results may at first sight seem somewhat confusing.

A narrow distribution of market income is good for growth because it reduces the demand for redistribution. But the main government policy for reducing income inequality — redistribution — is bad for growth. As Rodrik 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" (1998). In practice, what is meant is that measures that redistribute market income are bad for growth, but measures that encourage a narrowing of the distribution of income before taxes and transfers may be good for growth.

However, the data are only consistent with this argument. They do not prove it, and 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, 2000b). 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 (as well as growth rates falling). In other words, the causal connection would not be: *market income inequality causes high social spending which reduces growth*, but rather *high social spending causes market income inequality and reduces growth*.

Obviously this second interpretation of the results would lead to very different policy conclusions from the first interpretation. It would mean, for example, that 1 percent GDP of social expenditure reduces eventual GDP by 0.6 percent, and increases the market income inequality Gini coefficient by around half a point. It is not possible to use the results presented here to say which interpretation fits the data best.

CONCLUSIONS

When looking at detailed income distribution data over an extended period, the most striking fact is

that there has been an increase in market income inequality (almost) everywhere in the OECD. This is not (only) related to demographic aging — the widening of the market income distribution is apparent for the working-age population, as well as for the entire population. However, the trend in *final* income distribution is not quite so general. Whilst it is true that the final income distribution has widened in more countries than it has narrowed, at least since the mid-1980s, there are, nevertheless, counter-examples.

The fact that changes in the market income distribution have sometimes been offset by changes in the tax and transfer system reflects either a greater targeting of taxes on high incomes and/or benefits on low incomes, or else there must have been a greater amount in cash transfers. When examining trends in social expenditure it is apparent that the latter of the two effects is at least partly responsible. The trend toward greater social expenditure persists, at least up until the early 1990s. Since then any growth in social expenditure as a percentage of GDP appears to have stabilized.

These changes in income distribution and social protection expenditures are not trivial. Over an extended period, income before taxes and transfers has become more concentrated than before, and the government redistributes much more than before. This paper has had as its goal the objective of deciding whether there was any evidence that these changes altered the rate of growth in the economy.

The empirical results can be interpreted as follows.

How does the final income distribution (after taxes and transfers) affect growth? On the basis of this study, it is not possible to say one way or another. This is not the same thing as saying that there is no effect; still, if there were a strong effect of income distribution on growth (in whatever direction), it should have been apparent in one or more of the approaches tried. At first sight it looks as if evidence

is leaning toward a hint of a suggestion that a wider income distribution is good for growth. But on closer analysis, the estimate as a whole explains so little of differences in growth rates across countries and over time that in fact nothing can safely be concluded from the regression. This is true regardless of whether the theory being tested is one that requires looking at the whole income distribution, or just that of the working-age population.

How does social protection expenditure taken as a whole affect growth? The balance of evidence is that more social protection expenditure is bad for growth (but see the next point).

Does it matter what sort of social spending takes place? The balance of evidence is that it does indeed matter. The estimates discussed in this study suggest that more active spending is good for growth, whereas other social spending is associated with lower growth. In other words, cutting transfer payments might in some circumstances promote growth, but cutting attempts to help the disadvantaged support themselves would reduce growth.

So should we conclude that the study supports cutting cash transfers to promote growth? The message is more subtle. Some theories argue that the wider the distribution of market income, the more likely the population is to wish for redistribution to leave a "fairer" distribution of final income. As noted in a previous point, redistribution does appear to be associated with lower growth. Hence a wider market income distribution would be associated *indirectly* with lower growth. When tested using simultaneous equation regression techniques which jointly estimate whether a wider market income distribution is associated with more redistribution and whether the resultant redistribution is associated with slower growth, the data are consistent with this theory. To the extent that this is a correct way of interpreting the results, the level of social expenditure is not a pure or exogenous "choice" variable. It is (at least in part) a response by voters to the level of inequality that would otherwise prevail. Saying

that "the estimates show that cutting cash transfers would promote growth" misses the point: voters want growth, but they want equity too. The way to get both is through shifting the focus of social spending toward active measures, not mindlessly cutting passive expenditures.

However, the data are also perfectly consistent with an entirely different view, which *does* support cutting cash transfers to promote growth. High social spending may cause people to change their behaviour, relying on cash transfers from the government rather than generating market income themselves. To the extent that this interpretation of the results is correct, cutting social spending would boost growth but would also *narrow* the market income distribution, as people would work more and save more in response to less generous benefits. Because the approach used here does not permit a choice to be made between the two interpretations on statistical grounds, it leaves a key social and economic policy question unanswered. But both interpretations are consistent with the argument that the dilemma can be lessened by emphasizing active, rather than passive, social spending.

These conclusions are based on estimates using the most reliable data on OECD countries 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, but does not necessarily make them good. In particular, it is not possible to say whether these factors are robust in the presence of other influences on growth that have been found to be important.

Finally, it should be noted that all estimates 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 or a halving of passive spending would still be good for growth.

Common-sense suggests that the former might well result in wasteful spending, and the latter lead to resentment at an unfair distribution of final income.

NOTES

[1]See, for instance, the surveys of Aghion, Caroli and García-Peñalosa (1999); Bénabou (1996); Bertola (1998) and Temple (1999) for a comprehensive overview of the literature on the relationship between growth and inequality.

[2]The reason for using the working-age population rather than, say, GDP per capita is that the latter is influenced by demographic changes. An increase in the number of children or retired people, for example, will reduce GDP per capita (because the numerator is increased but the denominator is unchanged, assuming that they do not work), making it harder to separate out the effects of economic variables such as investment, schooling, etc. on growth.

[3]The sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, (Western) Germany, Greece, Ireland, Italy, Japan, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States.

[4]Arjona, Ladaique and Pearson (2001, Annex 2) discusses the problems and various techniques used to deal with them in more detail, and Annex 3 gives the results for the "baseline model" (i.e., the model as described by

Mankiw *et al.*, *without* the addition of income distribution or social expenditure variables) for all the different techniques used.

[5]This argument has received less attention recently, because its focus on the national supply of savings is seen as overly simplistic. Companies or governments seeking to finance investments can draw on international and not just domestic capital markets. However, although not strictly limited to domestic sources of finance, an economy may find it easier to sustain high investment without causing imbalances or vulnerability to short-run capital movements where domestic savings are high.

[6]They may well do so in order to have a fuller life, of course. See OECD (1998, 2000*b*).

[7]The most commonly used (the Gini coefficient) gives particular weight to changes around the middle of the income distribution; the squared coefficient of variation and the mean log deviation overweight changes at both extremes; and the ratio of the income of the ninetieth percentile to the tenth percentile ignores any income changes other than those that affect these two points. Despite these differences, changes over time are generally (but by no means universally — hence the case for using a variety of measures of inequality in empirical investigations) in the same direction, regardless of which measure is used.

[8]These results are consistent with the various national studies that have been undertaken (see Förster 2000 for a comparison).

[9]It seems reasonable to suppose that while the presence of some inequality may be positive for growth, a lot of it is likely to be detrimental. In other words, one could envisage a non-linear relationship between the rate of growth and inequality. In order to account for this relationship, a set of regressions was run including additional powers of the (log of the) inequality measures as regressors. Allowing for this change in specification had no sensible impact on the regression results and diagnostic statistics.

[10]This is precisely the approach followed by Forbes (2000), and may explain why that study found a positive coefficient on inequality.

[11]Atkinson (1999) examines the theoretical and empirical implications of this line of reasoning, shedding light on the nature of the relationship between the welfare state, economic growth, and overall societal welfare. His analysis finds no irrefutable evidence on the effects of the welfare state on economic growth.

[12]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.

[13]A one-percentage point increase in spending takes several years to have its full-scale impact on growth. The long-run elasticity of 0.7 should be interpreted as being the cumulative impact on GDP.

[14]The results in this paragraph are obtained from the estimates of total social spending, including health, estimated over the full time period, using the PMG model. All effects are calculated at the mean.

[15]For the 18 countries where it is possible to include both social expenditure and tax pressure, estimates using the PMG technique show that all coefficients (including social expenditure) remain approximately the same as when tax pressure is not present. Furthermore, the Hausman test calls for the coefficient on tax pressure to be unrestricted. The unrestricted estimate on tax pressure is insignificant.

[16]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.

[17]The effects referred to in this paragraph are based on the estimates obtained from the model including both active and non-active spending. Changes are based on increases in the mean value of parameters for those countries included in the estimates.

[18]The correlation between the two measures of active spending tested (active labour market programs and programs plus spending on make-work-pay policies and family services) is 0.84.

[19]These results are consistent with the theoretical findings of Tabellini (2000) and Casamatta, Cremer and Pestieau (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.

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