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GROWTH, INEQUALITY AND SOCIAL PROTECTION

(Note by the Secretariat)

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GROWTH, INEQUALITY AND SOCIAL PROTECTION

NOTE BY THE SECRETARIAT

1. As part of the OECD horizontal project on growth, the links between social protection expenditure, inequality and growth will be examined. This topic is the subject of a large and burgeoning number of academic studies, which frequently contradict one another, both in their theoretical predictions and empirical findings.

2. This paper provides one framework for interpreting existing academic studies. Further, it outlines how the recent development of higher-quality data for OECD countries may permit more robust empirical studies, and suggests how this might be done. Finally, it draws likely policy conclusions. These are based not on the empirical study (which has not yet been undertaken) but on identifying the most important elements of the various theories, and determining under what theoretical conditions social spending might be good or bad for growth.

3. Delegates are invited to:

- COMMENT on the suggested empirical approach, and to
- COMMENT on the suggested and anticipated policy conclusions.

SUMMARY

4. Economic growth is, ultimately, the result of the myriad of transactions which take place in a market economy. Similarly, the distribution of income depends who has ownership of factors of production, how much they can sell them for, and whether the resultant income is redistributed or not. It would be surprising were economic growth and income distribution not to be linked. But how exactly they might be linked has been the topic of many, many competing theories and empirical evaluations. Unfortunately, the studies have not led to a convergence on a common view that there is, or is not, a trade-off between the two goals of an equitable society and a rich one.

5. This lack of enlightenment becomes less surprising once the empirical studies are examined in more detail. Either accidentally or not, many empirical studies have looked at the final distribution of income, when some of the theories make stronger predictions about the links between growth and the distribution of income before taxes and transfers. In other words, much more attention is needed when doing empirical studies to systems of social protection and their links with income distribution and growth. Recently produced OECD data on human capital, income distribution and social expenditure permits a much more refined approach to the examination of the links between income distribution, social protection and growth.

6. Whilst no empirical results are reported in this paper, it is possible to identify from the theories the minimum conditions which have to be satisfied for their to be a possibility that spending on social protection is good for growth. These are: to avoid social unrest; to spread the gains from other growth-enhancing policies more widely in the population; to facilitate human capital investment; and to promote participation in the labour market. These conditions suggest objectives and approaches for social policy which coincide with conclusions of the OECD social policy Ministerial meeting.

GROWTH, INEQUALITY AND SOCIAL PROTECTION

1. The issues.

7. Implicitly or explicitly, macroeconomically or at the level of individual programmes, much discussion of social protection systems is dominated by supposed tradeoffs between the goals of growth and equity. Allusion is 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, which some argue is a price well worth paying, but which others resist.

8. This superficially sensible way of considering 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 in fact 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, one might think), then growth will itself affect the distribution of income.

9. Once one considers *policies* designed to achieve equity goals, then 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.

11. These issues take on added significance in the light of current discussions about the 'new economy'. However one cares to define the concept -- rapid productivity growth, heavy investment in information technology, new work organisation, a virtuous circle of technology-induced growth and innovation -- many have predicted that some will do very nicely out of the changes, and others will suffer. High rates of return on capital will reward those with wealth. High demand for skills in the 'new' areas of the economy will mean high wages. Equally, the very rapidity of economic change will mean those who cannot keep up, who do not have the skills to adapt, will find themselves pushed to the margins of economic activity, with low-paying work or no chance of employment at all. On the other hand, other factors can counterbalance this pessimistic view about 'winners' and 'losers' from change. Strong growth can suck more of the population into employment, evening out the distribution of earnings. Increased tax revenues may support the sustainability of systems of social protection.

12. The OECD has initiated a 'horizontal' project on growth, with inputs from the Economics Department, the Directorate for Science, Technology and Industry, and DEELSA. Recent growth trends were summarised in Economics Department Working Paper no. 248. This work, and indeed much of the ongoing work undertaken for the project, has been focussing on whether there is anything 'different' about recent growth. A document presented to the Ministerial Council summarised evidence for there being a 'new' economy, driven by technological change -- see http://www.oecd.org/subject/growth/new_eco.pdf/.

Another strand of the work by ECO and DSTI will be to look at the role of policy on economic growth (see e.g. ECO/CPE/WP1(2000)xx). DEELSA work is in three parts: to look at the role of human and social capital in the growth process, which also involves developing better measures of the two concepts (see ELSA/ED/CERI/CD(2000)4); the impact of changes in work organisation on growth (DEELSA/ELSA(2000)11), and the study described in this paper.

13. The purpose of this work, undertaken as part of the OECD horizontal project on growth, is to clarify what might be the tradeoffs, if any, between equity and growth objectives, and between policies designed to achieve equity goals and growth. It will be structured in three parts:

- A clarification of the different mechanisms through which equity, social protection and growth might be linked. There have been several new approaches to the issue recently, notably those which draw on the consequences of capital market failures, and others which model the links between the political process and social protection policies.

- An empirical examination of whether there is indeed any link between social protection policies, the distribution of income, and the rate of growth. Academic economists, too, have recently devoted much attention to this issue, partly due to the increased availability of income distribution data from various sources. However, with some exceptions, the data which has been used has been deficient in key respects. Recent work at the OECD on the distribution of income, and the availability of social protection expenditure data for a reasonable length of time, will permit different hypotheses to be tested in a more systematic manner.

- A discussion of the policy implications. Again, existing studies of the links between social protection (in particular) and growth have failed to understand the different roles of social protection, implicitly assuming that social protection consists of cash transfers from rich to poor, and not taking into account the role of active social policies and the fact that relatively few transfers are targeted on income.

2. The theories

14. In a market economy, the distribution of income can be seen as the outcome of two processes: first, the distribution of wages and capital income, and second, how the government redistributes the income from one group to another. The distribution of wages and capital income (together called market income) depends, in turn, on the distribution of assets which generate income, and the demand for these assets. Put more straightforwardly, the distribution of market income depends on the distribution of skills and capital in the economy, and the demand for those skills and the rate of return which can be generated from capital investment. The distribution of skills and capital depend on endowments -- what has happened in the past.

15. Any links between growth and the distribution of income must therefore involve connections between growth and one of the three determinants of the distribution of income: the distribution of capital and skills; the demand (and hence rate of return) for those skills and capital; or the redistribution of market income -- usually through taxes and transfers (but also potentially through charitable giving, crime against property, confiscation, nationalisation, enforcement or otherwise of patent laws).

16. Following a similar approach of simplifying complex relationships, growth can be seen as being dependent on the quantity of productive factors available, and the efficiency with which they are used.

17. Most theories about how income distribution, social protection and growth might be linked are based on the ways in which one or more of these three underlying 'causes' of income distribution are related to the two underlying 'causes' of growth, with the direction of causation going in one direction or another, sometimes directly, sometimes through the intermediary of the demand for, supply of, or effects of, social protection. Table 1 summarises the main groups of theories into 4 groups. Within some of these groups, there are often several variants, with wildly different implications.[1] More details are provided in Annex 1

Table 1: Summary of theories about growth, inequality and social .

3. The evidence.

36. As is so often the case, different theories provide remarkably different predictions as to the direction of causality between income distribution, social protection and growth, and between the expected effects. The result is that pretty much any relationship between growth, inequality and social protection can be justified (e.g. as summarised in the OECD(1996)) as being consistent with theory.

37. The usual approach in such circumstances would be to test the theories empirically. The Table in Annex 2 summarises schematically a selection of the attempts to do just that, looking at the empirical links between growth, inequality and social protection. But two problems arise. The first is widely recognised: growth being the sum change in the sum of all economic activity, anything which affects any part of economic activity can plausibly be argued to have an effect on growth. If the data is exposed to enough combinations of variables which might possibly affect growth rates, growth can be found to be correlated with pretty much anything and everything (see Sala-i-Martin (1997a and 1997b)). It is difficult to construct a case for preferring a specification which shows that one set of variables are important over another one. No questions are adequately resolved.

38. This problem is not addressed in the empirical work undertaken in this study. Hence no attempt is made to say whether income distribution is more important than the large number of factors which might potentially affect growth rates. Rather, the data is examined to see if there is a plausible case that income distribution and social protection have any effect *at all*.

39. The second problem is that the data used to test the hypotheses about the effects of income distribution and social protection is often inappropriate. In particular:

- often only summaries of final income distribution for the whole population have been used in empirical evaluations.
- Spending on a large variety of programmes are subsumed under the heading 'social protection'.[2]

40. The first of these two data problems arises from the failure to acknowledge that final income distribution is endogenous to the policy responses. For example, it is inappropriate to explain the demand for redistribution on the basis of data which is after taxes and transfers, so already takes into account redistribution. Similarly, if the underlying theory is based on the political process, then the income

1 . See, for instance, the surveys of Aghion et al. (1999), Bénabou (1996), Bertola (1998) and Temple (1999) for a comprehensive overview of the literature on the relationship between growth and inequality.

2 . Few authors have tried conscously toexamine this issue. An example is the paper of Vanhoudt (1997) who tried to establish a link and estimate the impact of labour market policies on unemployment and in turn on inequality.

distribution for the entire population might be appropriate; for those which refer to effects on incentives, a case can be made for focussing solely on the working age population.

41. The second data issue arises from grouping together all the various types of social expenditure as if their effects on economic behaviour will be the same. If the argument is that high marginal tax rates and reduced incentives to save and work from benefit systems reduces growth, then it might be preferable to look at spending on income transfers as the proxy variable for such effects. Using total social expenditure means that policies which reduce inequality through their effects on *market* income (income from work and capital) rather than income transfers, are also included. Spending on education, active labour market policies and other 'active policies' ('Make work pay' policies, health spending, child care spending) may promote the labour market participation and earnings of the low-skilled population, potentially promoting growth, rather than inhibiting it. Yet all such spending is confounded into a 'total social expenditure' variable. Furthermore, active policies should be expected to reduce *both* market income inequality *and* final income inequality, whereas passive tax/transfer policies will reduce final income inequality but have no effect or widen market income inequality. Yet the only variables used to test the demand for (growth inhibiting) social protection are total social spending and final income inequality.

42. Hence, for want of better data, the measures of the extent of social protection and the income distribution that have generally been used are too crude to give reliable insights (see Annex 2).

4. A new approach.

48. The OECD now has good quality *income distribution data* which distinguishes between market income and final income (and therefore which has a measure of the size of the pure redistributive effects of the tax/transfer system) for over 20 countries for at least one point in time. For a number of countries, data points from the mid 1980s and even the mid 1970s are available (see Förster, 2000). Furthermore, the data permits a distinction between the income distribution before and after taxes and transfers for the entire population and for the working age population alone.

49. The OECD *social expenditure data base* permits a more refined measure of the effects of social policy on income distribution than has been attempted in the past. In particular, it also becomes possible to identify spending on the working age population and the whole population, and on *active* policies (active labour market policies, in work benefits, child care payments) and *passive* policies. This latter distinction is important because the two types of expenditure have different effects on income equality measures.

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

- Passive policies can be expected to be market income inequality neutral or widening (because they substitute for market income alternatives) and final income inequality reducing.

50. Crucially, they also may have different effects on growth. For cash income transfers, the potentially positive effects depend on ensuring a stable social system and political support for growth

3. Hence the model estimated will be something like explaining the change in labour productivity as a function of a country-specific time trend, the level of capital investment as a share of GDP, a proxy for human capital, the level of GDP per worker, and the changes in all these variables. To the basic model will be added income distribution measures and measures of social protection expenditure. The equation which assumes comparable data across countries drops the 'change' variables.

enhancing policies. In addition, if sufficient income is transferred to the poor, capital market imperfections may be overcome, and there may be greater investment in education and human capital. Successful active policies, on the other hand, can have the same positive effects but in addition can also increase the quantity of labour supplied in the economy, so promoting growth. In other words, the more active spending in the total of social spending, the more positive or less negative should be the effects on growth. This hypothesis will be at the core of the proposed empirical work.

51. Based on the simplified model described in Annex 3, the central focus of the study will be to explain growth as being dependent on the level of certain key variables, also listed in Annex 3, and the change in these variables. This model suggests that growth depends on various standard variables, about which few dispute the significance (rate of investment, growth in the labour supply, initial level of income, etc). In addition, it may also depend on the level of social protection and inequality and the rate of growth of social protection and inequality, the rate of growth in inequality (it may seem strange that both *levels* and *rates of growth* in variables will both be tested, but in fact the theories differ in whether it is levels or changes in level which are important).

53. Whilst the quality of the data outlined in Annex 3 is significantly better than that which has been used in previous studies (with a few exceptions) there are nevertheless substantial remaining problems.

- Income distribution data is available in panel format for only a few data points. Interpolation using national data sources is necessary to get a more complete data set.

- Social expenditure is available on a fully reliable basis only to 1980, though interpolation using an alternative data set back to 1960 is a feasible approach. Health data is available from 1970. Active labour market policy expenditure is available from 1985. As with the income distribution data, fully reliable data over an extended period is probably an unattainable goal. However, it should be possible to generate a reasonable approximation of national expenditure on active and passive social spending going back over an adequate period for the purposes of this project.

5. Expected conclusions

55. Schematically, what might be expected to come from the study is the following:

- There is much confusion about whether theory suggests that a wide income distribution and low social protection expenditure is good or bad for growth. Without empirical evidence, it is impossible to talk of effects of income distribution and social protection on growth as if they can be known *a priori*.

- The predictions of some models require analysis of the pre-tax and transfer distribution of income. Most empirical analysis has been on post-tax and transfer income distributions.

- Further reflection and analysis of the various theories leads one to suspect that the predicted effects of social protection expenditure in particular on growth depends on the type of social expenditure, not just its aggregate level. No empirical analysis has made this distinction.

- Regardless of whether the empirical exercise undertaken in this particular study leads to parameter estimates which are significant[4], one should therefore view previous studies which claim to shed light on this issue somewhat sceptically.

- This is particularly so given that there are so many other potential 'explanations' of growth which have plausibly been claimed to be important and which may have indirect effects on the distribution of income and social protection. Unless the empirical evidence on the causes of growth more generally becomes much more clear-cut (seemingly, a very unlikely prospect), then all evidence which focuses on income distribution and social protection alone is indicative, no more.

56. However, even without empirical evidence, the policy conclusions are perhaps rather more clear than might be thought, given the number of competing theoretical models of the links between growth and social protection. In particular, social protection is by no means unambiguously bad for growth. However, for it to be good for growth one or more of the four following conditions needs to be satisfied:

- The income distribution is becoming so unequal that social strife increases;

- The income distribution is coming to be perceived as being unfair, leading voters to oppose measures which are necessary to increase or maintain the growth rate, such as trade liberalisation, deregulation and privatisation;

- Poverty is leading to a situation where individuals and families are unable to access capital markets to engage in desirable (and growth-enhancing) investments, particularly in human capital.

- Social protection is enhancing the capacity of individuals and families to take advantage of market opportunities. In practice, this means enhancing the incentive to participate in the labour market, or else increasing the skills of individuals and their employability more generally.

57. Even when one or more of these conditions are satisfied, the potential negative effects of social protection on growth, on labour market participation, savings and rent seeking (through increased tax rates, as well as directly through social programmes) must be seen as offsetting potential beneficial effects.

58. Hence the overall policy conclusion is likely to be in line with that followed for the 1998 social policy ministerial (and in the report *A Caring World: the new social policy agenda*): far from there being any intrinsic contradiction between an efficient dynamic economy and one that places social justice at its core, the achievement of the former requires the latter. However, the best way to achieve the latter is to help individuals and families to help themselves by investing in their capacity to participate in the modern economy, by stressing active, rather than passive, interventions.

4 . Realistically, given inevitably short time series of data, such an outcome cannot be expected.

Table 1: Summary of theories about growth, inequality and social protection

	Process involved:	Predictions of the theory:	Theories associated with:
1.	Growth changes endowments changing income distribution	Income distribution widens, then narrows, as resources move from low productivity (agriculture) to high productivity (industrial) sectors	Kuznets (1955)
2a.	Income distribution affects growth by affecting the relative quantity of productive factors	The rich save more than the poor. More savings mean more investment meaning more growth. The wider the income distribution, the more rapid is growth.	Lewis (1954), Kaldor (1956, 1957), Stiglitz (1969)
2b.		Due to capital market imperfections and indivisibilities in human capital investments, the poor cannot borrow and invest (in human capital, in particular). The wider is the income distribution, the slower is growth.	St Paul and Verdier (1992), Galor and Zeira (1993), Perotti (1993)
3a.	Social Protection affects growth by affecting the quantity and/or the efficiency of productive factors, lowering the incentives to accumulate capital	Social protection alters prices, so harms the allocative efficiency of the price mechanism. People save or work less, so reducing the quantity of factors. More social protection may reduce inequality, but only at the cost of reducing growth	Mirlees (1971) and others, too numerous to mention.
3b.		Social protection diverts society into arguing 'for a bigger slice of the cake' rather than productive activity.	Lindbeck (1975, 1995)
4a.	Income distribution affects the social and political process which affects growth by affecting the efficiency of productive factors	Social protection guarantees 'losers' from market-friendly reforms which promote growth a share of the gains, broadening the political support for such measures.	Rodrik (1997)
4a		Too unequal a society is associated with social and political unrest, retarding investment.	The 'new' Latin American literature. For instance, Perotti (1992, 1994 and 1996) or Keefer and Knack (1995b)
4b		The wider is the income distribution, the greater is political support for redistribution, which in turn retards growth.	Persson and Tabellini (1994), Alesina and Rodrik (1994), and the Political economy literature.

NOTE: In a strict neo-classical growth model, in the long run growth is determined by the quantity of labour and the evolution of labour productivity. Changes in e.g. the amount of investment or redistribution only affect growth during a transition period (see Aghion and Bolton (1997)). The table above (and indeed this report) assumes that growth does depend on investment, which can be taken as being consistent with endogenous growth models, or with a belief that the 'transition' period is probably as long as most people's time frame. See 'Links between policy and growth: cross country evidence', ECO/CPE/WP1(2000)xx.

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ANNEX 1: THEORIES OF LINKS BETWEEN GROWTH AND SOCIAL PROTECTION

60. The theories discussed in this annex follow the classification used in Table 1 in the main text.

1) Growth determines the distribution of income.

61. A group of theories associated with Kuznets (1955) focus on the first of these processes. For example, as countries develop, so would individuals move from the low productivity, low income part of the economy, to the high income sector.[5] At first, the income distribution would widen, but after a certain point, so few would be left in the unproductive part of the economy that they further movement from non-productive to productive employment would *narrow* the income distribution once again. The relationship between inequality and average income would follow the so-called 'inverted U' argument.

62. Whilst most OECD countries are not in the sort of economic position which makes this theory directly applicable, there is an obvious resonance with recent economic changes. The income distribution before taxes and transfers depends on two elements: the distribution of factor endowments, and the demand for those endowments. At a time of relatively rapid economic change, demand for some factors (e.g. high skills or capital) will be high, but relatively few people will have the endowments. It is of course possible for the distribution of factor endowments to be changed (for example, by investing in education), but this is a long term process. Hence the emergence of new economic opportunities, be they driven by technology or expanded market openings, will cause the income distribution to widen.

63. Hence there are good reasons to look at the distribution of income as being an outcome of long run economic processes which themselves determine factor endowments and the demand for these factors. There are few policy levers which can affect the distribution of factor endowments, and even fewer which affect the demand for the factors, so little more will be said about this particular link in this project. That does not mean that it should be considered irrelevant or unimportant to OECD countries . Indeed, this story about how income distribution might change due to long-run economic trends seems to mirror some aspects of recent economic developments. First, there has been the emergence of new technologies and in particular the Information Technology industry; and second, there has been a widening of market opportunities, both through a reassessment of the borderline between public and private provision, and in the extent of integration of geographically distinct economies. That those in possession of scarce endowments have benefited and that those who have been displaced from failing industries but who, for whatever reason, have been unable to take advantage of market opportunities, have suffered, is hardly surprising. The income distribution widened. More recently, however, at least in the United States, the distribution of income has started to narrow once more as demand has sucked even the low skilled back into employment.

5. In fact, in the original Kuznets' argument individuals moved from low income and low productivity agriculture to the richer urban sector. The theory was based around the distribution of capital income but the line of reasoning followed the same pattern as the one given here.

2) The income distribution affects growth directly.

64. This section considers the various ways in which the distribution of income might affect the accumulation of factors of production and thereby the growth rate *directly*. (There are a number of theories which are based around the idea of their being a link between the *political* process and the distribution of income, with the idea being that some distributions are more likely to result in growth-enhancing economic policies than others. A discussion of these theories is held over until section 4 below).

65. 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 is the amount of savings, the lower is the cost of capital and the greater is the rate of investment, and hence (at least temporarily in a neo-classical model, permanently in some other formulations) the greater is the rate of growth. 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. Income redistribution would retard growth unless governments took additional steps to ensure that investment remained high.

66. 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. On the other hand, whilst this suggests that there need be no correlation between national savings and investment rates, in practice the correlation remains relatively strong (albeit declining over time), as suggested by the 'Feldstein-Horioka' puzzle (1980). A large difference between savings and investment rates implies imbalances in either the current account or in public sector borrowing which may become the objective of policy to limit. Hence, 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 (made available by national investors) provide a substantial proportion of required funds, as advocated by the 'home bias' puzzle.

67. 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 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).

3) Social protection affects growth.

68. The two groups of theories discussed so far describe how growth might affect the income distribution and how income distribution might affect growth. They do not refer to social protection. It might be inferred from them that social protection might affect growth (or be affected by growth) through altering the distribution of income, but this is implicit in the theories, not explicit.

69. There are, however, several groups of theories which 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, 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. There are many more such examples which could be given.

70. 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 '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.

4) Income distribution, the political process and growth

71. The previous theory looks at social protection as providing a forum for groups to pursue their material objectives, distracting attention from wealth creation. The political process is not considered directly: rather, the mere fact of politics entering the discussion about 'who should get what' is suggested to be bad for growth. However, another group of theories model the political process explicitly. Income distribution leads people to vote in a particular way in order to introduce policies which benefit them, with consequences for the rate of growth.

72. One approach which has received some attention recently (e.g. Rodrik (1997)) is to suppose that growth can be increased or retarded through pieces of legislation (such as openness to trade and investment from abroad, but also privatisation, liberalisation, etc) which nevertheless are not directly in the immediate interests of some part of the voting population. For example, there may well be clear-cut net gains from opening an economy to trade, but those who have been working in activities which 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. However, social protection both ensures that those who lose are protected (through unemployment insurance and other benefits for those without work, and through active policies which help people gain useful labour market skills), and that those who gain will pay higher taxes, thus distributing the gains (and losses) from such policies over the population, making it more likely that policies which do have a net overall benefit are distributed more evenly than they otherwise would be. This makes the chance of a coalition forming to block such policies much more unlikely than it would have been in the absence of social protection.

73. 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 will find it harder to adjust to job loss than those who have greater skills. In practice, those who are least likely to benefit directly from market opening are likely to be those with low incomes.

74. A second theory takes this a stage further, and argues that a wide income distribution causes 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, with a link being drawn 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 -- including in the most extreme form, support for insurgency, separatist

movements, and tolerance of drug barons. The work of Perotti (1992, 1994 and 1996) has blazed a trail in this area.

75. A third 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.

76. A simple model of the links between income distribution, social protection and growth states that if there is a wide distribution of income, the population will vote for redistribution which in turn will, it is assumed, harm growth. On the other hand, a narrower income distribution will lead to less redistribution, and more growth.

77. However, these 'political' models of redistribution implicitly simplify the choices facing voters. A very small part of social protection expenditure has redistribution from rich to poor as the overt objective. Instead, as discussed in Förster (2000), most social expenditure redistributes from childless households to families with children, from young to old, from healthy to sick and from those who work to those who do not. Even the method of financing social protection may be designed to limit the redistribution from rich to poor (through ceilings on social security contributions, for example). This does not *necessarily* mean that models based on the 'median voter' assessing the possibility of voting him or herself an increase in income by reducing that of the rich, because it may be that this round-about way is the most efficient manner of to effectuating the underlying objective of income redistribution. But there is at least an element of sophism in such an argument. In particular, treating expenditures on contribution-based pension systems as being motivated by the same objectives as, say, social assistance expenditures is unconvincing. There is arguably a need to be more subtle when interpreting the effects on growth of social expenditure.

ANNEX 2: SUMMARY OF EMPIRICAL STUDIES

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 Sources: some existing data-sets, see Fields (1993) and Persson and Tabellini (1991).	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.
Barro (1996)	TO BE DONE .			
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. Data sources: 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) using controls for investment and employment and period dummies. Sample: 18 OECD countries. Sources: OECD Historical Statistics and National Accounts.	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.
Devarajan et al. (1993)	Period: 1970-1990. Method: OLS. Sample: 69 countries. Sources: IMF GFS.	Moving average of per capital 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 ones. Sources: Summers and Heston (1991), Barro and Wolf (1989), GFS, IFS and Easterly et al. (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 Historical Statistics and OECD Economic Outlook.	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*	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

			*: controls for pooled OECD and developing sample	expenditure and GDP growth.
Hansson and Henrekson (1994)	Period: 1970-87. Method: Cross-country and cross-industry OLS, controlling for investment and employment. Sample: 14 OECD countries. Sources: OECD Historical Statistics.	Real private output in 14 industries.	OECD social security transfers/GDP	Negative and significant effect for subperiod 1965-82.
Keefer and Knack (1995a)	Period: 1960-1985. Method: OLS. Sample: developing countries.	Gini. Land Gini. -Q3, 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 -Q3 and redistribution.
Keefer and Knack (1995b)	Period: 1960-1985. Method: OLS. Sample: developing countries. Sources: 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. Sources: ILO Social Expenditure.	Real per capita GDP	ILO Social expenditure/GDP	Positive and significant coefficients.
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 Historical Statistics, OECD Labour Force Statistics, Summers and Heston (1988), OECD National Accounts.	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 National Accounts.	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 National Accounts.	Logarithm of the ratio of 5th to 3rd quintile of the income distribution. Logarithm of the ratio of 3rdto 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 but not significant relationship for the education variable. When the author focuses on investment, the signs are positive and significant. "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 program.
McCallum and Blais (1987)	Period: 1960-83. Method: OLS. Pooled time-series and cross-section analysis. Sample: 17 OECD countries. Sources: OECD Historical Statistics. Method: IV with controls for employment growth.	Real GDP	OECD Social Security Transfers/GDP	Positive and significant coefficients.
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 percent. Gini coefficient. Middle class gain generated by moving from factor to disposable income. Using: factor income, factor P	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 *factor* 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

		income (factor income plus pension transfers), disposable income.		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 National Accounts.	Real GDP growth	Other current transfers item in OECD National Accounts.	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 et al. (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.
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.
Persson and Tabellini (1994)	Period: 1960-1985. Sample: cross section of 13 OECD countries. Method: total effect is measured using unweighted IV estimation. Sources: 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. Source: 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.	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,	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

	Sources: Deininger and Squire's (1996) dataset on inequality, the Penn World Tables (PWT5.6), OECD Science and Technology Indicators, OECD Job Study, and OECD Employment Outlook.		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.	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. Sources: OECD Historical Statistics.	Real GDP. Real per capita GDP.	OECD social security transfers/GDP.	Negative coefficients with strong effects.
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. Sources: OECD Historical Statistics.	Real GDP Per capita GDP Per worker GDP	OECD social security transfers/GDP.	Relatively strong negative effects.

ANNEX 3: EMPIRICAL APPROACH TO BE USED IN THE OECD STUDY

78. The standard approach of many recent empirical studies is to take a straightforward Cobb-Douglas production function:

$$Q_{jt} = \exp\left(\sum_j \gamma_j T_j + \sum_j \delta_j J_j\right) K_{jt}^{\alpha} H_{jt}^{\lambda} (E_{jt} L_{jt})^{1-\alpha-\lambda}$$

where Q is output, H is the human capital stock, K is the physical capital stock, L is the amount of labour and E is the efficiency with which assets are used. J and t are country and time indicators. T_1 is 1 is the observation is year 1 and 0 otherwise and, similarly, J_1 is 1 if the observation is country *1* and 0 otherwise.

79. In addition to the three inputs (physical capital, labour and human capital), the production function may also vary with differences in time and country characteristics to account for short-run economic shocks and longer-run disembodied technical change. It is traditionally assumed that time (*t*) and country (*j*) effects only result in multiplicative shifts in overall production but do not interact with any of the inputs (Brynjolfsson and Hitt (1995)). In addition, the Cobb-Douglas functional form has the appealing property of allowing for direct calculation of the output elasticities. Employing a simple logarithmic version of the production function and adding an error term, the following equation is obtained. This equation can be considered to be a first order approximation to an arbitrary production function:

$$\log q_{jt} = \sum_j \gamma_j T_j + \sum_j \delta_j J_j + \beta_1 \log k_{jt} + \beta_2 \log h_{jt} + \beta_3 \log e_{jt} + \varepsilon_{jt}$$

where low case variables are in 'per worker' terms, and the following parameter restrictions apply $ß_1 = \alpha$, $ß_2 = \lambda$ and $ß_3 = 1 - ß_1 - ß_2$. In this formulation, the coefficients represent the output elasticities of the various inputs (the percentage change in output for a 1 percent change in the quantity of input). Output elasticities can be translated into marginal products (the amount of additional output provided for an additional dollar of investment in input).[6]

80. This basic model needs some minor adaptations in order to look at the relationship between income distribution and growth. First, of course, it does not include the distribution of income. This does not, perhaps, matter too much, as an unrestricted form of the equation can be used (ie. the relationship between the different parameters such as α and λ, which is implied by the Cobb-Douglas function is not forced on the data) and a variable for income inequality can be added. The previous specification aims at accounting for another potential problem, noted by Brandolini and Rossi (1998) -- namely, the fact that country specific effects are usually *not* included in the equations derived from standard production functions, and the fact that there is usually no role for time-specific effects. If, as has been very often the case, income distribution data has been used which differs across countries in a variety of ways -- definition of income, population sample, household definition, equivalence scale used, etc -- then "cross-

6 . Different techniques could be used to estimate the model. The approach in this paper aims at using simple econometric methods such as standard OLS or 2SLS with fixed effects.

sectional analyses have been mixing up measures of inequality with a questionable degree of logical and statistical comparability. As a result, the cross-country variability of inequality measures may have accounted for country-specific effects ruled out by assumption in the cross-sectional context"(Brandolini and Rossi, 1998). Problems of the same nature, it might be added, may have arisen with some of the more 'ad hoc' sources of social protection data used to check for links between growth and social protection in the past.

81. There are two possible approaches to tackle this problems. One is to use an alternative formulation, along the lines of the one presented above, allowing for country-specific effects. Such a fixed-effects model will permit the use of national inequality measures and measures of social protection spending which, though not strictly comparable across countries, are nevertheless comparable across time within each country. Such data is available for a substantial number of countries.[7]

82. The data to be used in the OECD study is described in the following paragraphs.

1. Core growth variables

The labour productivity, capital stock, population growth and human capital variables used will be the standard OECD set used in all parts of the horizontal growth project.

2. Income distribution variables

Core set:

1) Gini coefficients and p90/p10 after taxes and transfers for whole population

2) Gini coefficients and p90/p10 after taxes and transfers for working age population

3) Gini coefficients and p90/p10 before taxes and transfers for the whole population

4) Gini coefficients and p90/p10 before taxes and transfers for the working age population.

Source: OECD questionnaire on trends in income distribution and poverty, Förster 2000.

This data will be supplemented for the fixed effects modeling and in order to extend the usable data from the following sources:

Deininger and Squire (1998) (the UN data collection source -- good country coverage, but no cross-country comparability of data)

Gottschalk and Smeeding (1999) (based on the Luxembourg Income Study data)

Milanovic (2000) (a World Bank data source).

7. Hence the model estimated will be something like explaining the change in labour productivity as a function of a country-specific time trend, the level of capital investment as a share of GDP, a proxy for human capital, the level of GDP per worker, and the changes in all these variables. To the basic model will be added income distribution measures and measures of social protection expenditure. The equation which assumes comparable data across countries drops the 'change' variables.

Domenech and De la Fuente (2000) (a recently updated dataset)

Miscellaneous other data sources providing historical information on income distributions.

3. Expenditure data (defined as %GDP except where noted)

1) Total government consumption (from OECD National Accounts)

2) Total public social spending (the sum of the public expenditure data in OECD Health Data, OECD Education data, OECD Social Expenditure Data Base and OECD Active Labour Market Policy data base).

3) Total active spending (a). Total public expenditure on Education and active labour market policies.

4) Total active spending (b). As 3), plus health expenditure

5) Total active spending (c). As 4), plus other active social spending (in work benefits and tax credits, child care expenditure. The distinction between 'active' and 'passive' social spending will build on *Maxwell Stamp,* 2000).

6) Total passive spending (a). Income transfers recorded in SOCX.

7) Total passive spending (b). Difference between Gini co-efficients/p90/p10 before and after taxes and transfers.

8) Passive spending on the working-age population (a). As 6), minus cash income support for old age pensions and survivors benefits.

9) Passive spending on the working-age population (b). As 7), for the working age population.