

Income Distribution in Europe and its Effect on Investment Priorities

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Abstract

This paper focuses on the measurement of regional priorities and their effect on the allocation of regional funds in the European Union (EU) looking at the less well off countries. The application of distributional welfare weights in the appraisal of development projects is emphasized in the guidance provided by the European Commission (EC). Application of such weights in a regional context is an important consideration given that the EC has provided a large budget of over €300 bn to finance investment projects in the European Union over the period 2007-2013. The main beneficiaries of these funds are the 12 less well off new member states some of whom have suffered considerably during the latest economic crisis. Living standards in the new member states, based on the gross domestic product (GDP) exhibit substantial regional variation, and thus it is of interest to explore the potential funding allocation impact resulting from the application of regional welfare weights in the social appraisal of investment projects in the EU-12 region. This paper develops a suitable model for the application of regional welfare weights in cost benefit analysis and then applies it to a number of new EU member states and one negotiating country, Turkey.

Keywords: *European Structural Funds, Regional Priorities, Income Distribution, Economic Development.*

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Introduction

Pareto welfare criterion based on people's willingness to pay for a project's output is regarded by many as a narrow interpretation of improvement in social well-being. A broader opinion is that even though poorer individuals may be less able to pay for a particular benefit, they may obtain greater utility from it. In line with the broader opinion, this paper looks at country based welfare weights in the European Union with a special emphasis on relatively poor countries who became members recently. Welfare weights now have a high policy profile in the European Union in relation to distribution of funds between member and member to be countries. They can also be used in cost-benefit analysis to give priority to infrastructure projects in underprivileged areas.

According to Pareto Rule, a society would be made better off if at least some of its members improved their position without making anyone worse off. Some economists realised that as no project is likely to meet this rule, then no project should ever be approved. Addressing this problem, Kaldor and Hicks modified the Pareto rule by suggesting that a project should be allowed if it improved the well-being of some people even though others might lose out, provided that the gainers compensate the losers and still are no worse off. However, this has been criticised on the grounds that, in reality, compensation is not paid and thus the rule simply gives an excuse to governments to go ahead with projects, especially of environmental variety, that may create lasting injury to some members of society

Layard and Glaister (1994) contend that if incomes were optimally distributed, \$1 would mean the same to everybody regardless of who gets it. If incomes are not optimally distributed most would argue that it should be re-distributed by taxation and subsidies not by using cost benefit analysis. But what if the money can not be re-distributed in this way? Then there would be a need to value the poor person's extra \$1 more highly than the rich person's \$1. If the government is unable to re-distribute income by using fiscal measures there would be a compelling case to allow for welfare weights to be used in cost benefit analysis.

Some argue that cost-benefit analysis should not be separated from the rest of public policy in which the government's overall aim is to maximise the welfare of its citizens, which may also include a more equitable

income distribution than the one at present. Seen in this wider context, plus the fact that income will be re-distributed between existing members of society as well as between generations, the analyst will, inevitably, face the difficult task of judging projects' effects on the well-being of all those affected.

One short cut would be to pretend that distributional and other moral issues are outside the cost-benefit analyst's area of competence and that they are best left to the government to handle. Indeed, some economists, owing either to the difficulty of the task or their own indifference, try to steer clear of such thorny questions.

For example, Pearce (1983: 3) argues that: "As a procedure for aggregating the preferences of our set of individuals, we establish something of a fundamental importance at the outset: cost-benefit analysis makes no claim to produce morally correct decisions. What cost-benefit analysis produces and what is morally correct may coincide if, and only if, we adopt a further rule, namely, that some aggregated set of preferences of individuals is morally correct way of making decisions."

Not all economists would agree with this viewpoint. In effect, economics, as a social science, has an old and rich tradition of just conduct in all areas of its jurisdiction. Concepts such as fair competition, fair employment practices, just wage, just profits have always preoccupied the profession. Of course, the next question is, what is the morally correct position in the main body of economics and in its various branches such as cost-benefit analysis? This is an issue that needs to be discussed; 'sweeping it under a carpet' will not be helpful to policy makers or to practitioners of cost-benefit analysis.

Theoretical Framework

Economic theory provides a framework for giving greater weights to income accruing to the poor rather than to the rich; the 'diminishing marginal utility of income', which is one of the oldest concepts in economic theory, for its roots can be traced to the writings of Dupuit, Gossen and Jennings in the mid-nineteenth century. Despite its great potentiality in economic analysis, this theory had gone unnoticed for a long period of time, which led Stigler (1972) to express concern that this was largely due to lack of professionalism in economics. More than eighty years after its

first appearance in the literature, Irving Fisher (1927) used the diminishing marginal utility of increasing income in justification of progressive income tax which is now used in most countries of the world.

The concept is important for intragenerational distribution of income. This theory, which is backed by substantial empirical evidence, (see below), helps us to calculate welfare weights which can be used in cost-benefit analysis. Generally speaking, welfare weights mean the relative values attached to unit increments in incomes accruing to various sections of the population. The introduction of distribution effects explicitly into cost-benefit analysis would be to supplement estimates of the total costs and benefits that stem from investment projects with indications of how these are divided amongst the population. If the distributional dimensions of a project are to be made explicit then there must be a decision concerning which distributional dimensions are worthy of consideration. There can be a number of criteria that income distribution can be applicable; regions, gender, ethnicity, religion, age, and so on.

Let us assume, for the end of simplicity, an identical consumption utility function for individuals in the community. Each individual's utility derives from his/her own consumption; that is, there are no interpersonal externalities in the form of envy or pity. The social welfare function includes all individuals in the community that is:

$$SW = f(U_1, U_2, U_3, \dots) \tag{1}$$

where SW is social welfare, which is a function of utilities of individuals/households (Us) in the community. From this expression the change in communal welfare may be aggregated on the basis of increments in individual income. That is:

$$\Delta SW = \sum U_i \Delta Y_i \tag{2}$$

where U_i is the i th person/household's utility resulting from a change in its income, Y_i .

Let us consider regions as the case material in this paper and modify our utility function in this way:

$$SW = f(U_A, U_B, U_C, \dots) \quad (3)$$

where each subscript refers to a region. In this, it is postulated that the government is considering a social welfare function from the viewpoint of the regions, a highly realistic position in many countries including the EU. Regions can be defined strictly by political/administrative borders, e.g. states, counties, or loosely by taking some broad geographical factors into consideration such as central, southern or northern Turkey. Each region can, of course, be put into various sub-sections. In theory, the policy maker can have as many regions as it wishes, although in reality most regions are established by geographical, historic and political considerations.

As can be seen from the shape of the total utility curve, Figure 1, the absolute level of utility is increasing all the while as income level grows, but this increase occurs at a diminishing rate. There is a long-winded debate in economic literature as to whether a person's utility can be measured and compared by using a cardinal index. Some believe that cardinal utility is a problematic concept and thus they prefer ordinal utility; which leaves us with the Pareto criterion, which is not very helpful in this case.

Assume a hypothetical public project that can benefit any given region of additional income. Clearly, there is a strong case for locating the project in Region a (poor region) rather than in Region B (rich region) for additional income will bring greater utility to the former. If, in a timeless world (which avoids problems of discounting and intergenerational equity), the social welfare function is the sum of all individual utilities, there will be a greater increase in communal welfare when the poor (Region A) becomes the beneficiary:

$$U_A U_A' > U_B U_B'$$

When there are n regions in the country the social welfare function will be:

$$SWF = \sum_{i=1}^n U_i \quad (4)$$

where U_i is the utility of the i th region.

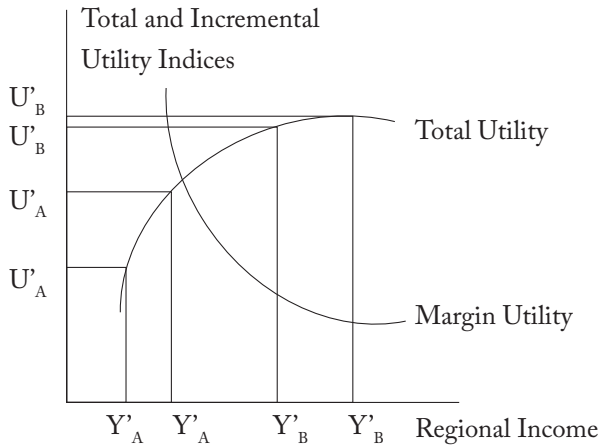


Figure 1. Regional Total and Marginal Utility Functions

Since the regional utility indices are to be summed up we must find a common unit of measurement and this is taken to be the per capita regional income. The assumption that there is a strong correlation between income and utility levels between regions is supported by migration in most countries of the world from deprived areas to the better off regions and this is highly conspicuous in developing countries. When income levels vary sharply between the regions of a country the use of regional welfare weights in cost benefit analysis may become an additional policy instrument (in addition to maximisation of social welfare) to moderate the movement of the people by giving poor regions priority in the location of public and private sector projects to generate much needed income and employment in these areas. This has already been done in the European Union where poor regions are looked after by way of regional development aids, which, in the main, support investment projects in various regions.

The use of regional welfare weights in cost benefit analysis would give priority to poor areas in the choice of venues. In addition, the government by way of a financial support policy may wish to attract private sector projects into the disadvantaged regions. Regional welfare weights may help to decide the extent of a support package.

However, it has to be pointed out that a project may be located in a poor region but in fact may benefit the better off individuals there. It is often the case that income distribution in poor regions is more skewed than in rich regions. It is not automatically guaranteed that the choice of location alone would achieve the desired objective. Therefore, the public sector

policy maker may have to devise further measures to ensure that rich in a less favoured area do not capture most of the benefits.

A Model for Welfare Weights

We have already mentioned that as the consumption levels raise the utility increases at a decreasing rate. What is the extent of this decrease? For this we need to consider the marginal utility function in Figure 1. In this function the elasticity of marginal utility of consumption is assumed to be constant then;

$$U_i = \frac{C_i^{1-e}}{1-e} \tag{5}$$

where C_i is the per capita consumption in the region, e is the elasticity of marginal utility of income.

The incremental, or marginal, utility would be:

$$\frac{dU_i}{dC_i} = C_i^{-e} \tag{6}$$

The elasticity of this function becomes:

$$\frac{d^2U_i}{d_i C^2} \frac{C_i}{dU_{i_i} / dC_i} \tag{7}$$

which yields $-e$.

There is nothing sacrosanct about the constancy of the elasticity of marginal utility of consumption. This assumption is made because it is mathematically convenient, and also because it yields good results in calculations. Most importantly, empirical research lends support to this assumption. For example, Blue and Tweeten (1997) by using data on incomes taken from US Social Surveys construct a quality of life index, a proxy measure for utility, in which consumption levels turn out to be the most significant variable amongst all the factors considered. Furthermore, the majority of regression models used in their study confirms the shape of the marginal utility function, Figure 1.

In cost-benefit analysis, we are mainly interested in comparing consumption increases between different regions/groups. To see whether marginal utilities differ across regions, we can look at the following ratio:

$$\frac{MU_i}{MU_j} = \frac{C_i^e}{C_j^e} = \frac{C_j^e}{C_i} \quad (8)$$

The distributional weight, W , of region i to the average level of consumption in the country, \bar{C} , would be:

$$W = \frac{\bar{C}^e}{C_i} \quad (9)$$

By choosing the average consumption level in the community as our yardstick, we can compare the welfare effects of a project to individuals in different income groups, or in different regions.

The Use of Welfare Weights

The welfare weights can be implemented in a variety of ways in the European Union. First, how much a member state should contribute to the European Union's structural funds? In fact it was Irving Fisher (1927) who recommended the use of the concept of diminishing marginal utility of consumption, which is the foundation of welfare weights, in justification of a progressive income tax scheme. If the rich pay more in terms of taxes compared with others then welfare loss to the community would be minimized. Second, welfare weights can also be used in the allocation of funds between member states. Money given to a relatively poor country would generate greater welfare in the community than the same amount given to a well off country, Evans (2004) and Evans *et al* (2005). Third, welfare weights can also be used in the appraisal of European communal projects. For example an infrastructure project located in a relatively deprived location would rise in prominence when its net present value is multiplied by the relevant welfare weight.

One important issue in cost-benefit analysis is to define the boundaries of the economy in which investment projects are located. In the past the national borders were used. Discount rate, shadow prices, welfare

weights and valuation methods were all based on the national economic conditions. From the viewpoint of the European Union there is a convincing case that boundaries should be the jurisdiction of the Union including all member states. Especially when member states contribute to the common pool of money from which allocation is made to support various infrastructure and other projects the entire map of the European Union should be considered. That is from a theoretical perspective the European Union based welfare function should replace the national ones. The EU has already been harmonising the social discount rate, another crucial parameter in cost-benefit analysis, in the 27 member countries, which is an indication of moving towards a Europe wide calculation.

Here we look at regional based welfare weights for three countries of the European Union; Slovakia, Bulgaria, Romania and one negotiating country, Turkey, who is to become a full member in due course. Their per capita incomes based on the purchasing power parity (PPP) unit of measurement are shown in Table 1.

Table 1. Per Capita Real Incomes Estimates for 2008

Country	Income p.c. \$	p.c. of EU Average
Slovakia	18 700	72.2
Bulgaria	11 300	41.3
Romania	10 700	40.9
Turkey	11 600	45.8
EU Average	26 177	100.0

Source: Eurostat (2009)

For the third parameter in equation (8) we need estimates of e . In a recent article Evans (2005) calculated elasticity of marginal utility of income, e , for twenty countries thirteen of which belong to the European Union. His estimates centre on a figure of 1.5, which is used in welfare weight estimates in our four countries. The figures are:

Slovakia	1.39
Bulgaria	2.42
Romania	2.45
Turkey	2.18

All these numbers are greater than unity. That is, in an EU wide cost-benefit analysis of, say, infrastructure projects, the net present value figures for them to be multiplied by the relative regional welfare weights which would increase their priority. If the European Union assumes that well being of all member states are equally important then there would be a case for using welfare weights in raising revenue for structural funds in the allocation of money to member states and last but not least in cost benefit analysis of structural projects.

It has to be mentioned that regional disparities exist even in well of countries of the European Union. For example Evans *et al* 2005 look at the case in the United Kingdom and argue that a greater priority should be given to Northern Ireland. In effect, HM Treasury (2003) in its latest guidance on the appraisal and evaluation in central government spending has raised the policy profile of distributional impact of social projects favouring the underprivileged regions. Similar cases can be made for various regions in other countries of the European Union such as Sicily in Italy, Eastern part of Germany, South and North Cyprus, Evans and Kula (2011), etc.

Conclusion

The use of distributional weights normally produces a systematic bias in investment analysis favouring projects that benefit the poor rather than the rich. This should not be regarded as being a distortion in the rational use of scarce resources, but rather a manifestation of fundamental socio-economic objectives of the European Community who may wish to consider equity and efficiency objectives simultaneously.

Although welfare weights may or may not be decisive for any particular project, it is quite clear that this type of broader analysis will result in a pattern of decisions that would differ significantly from the one that would emerge if distributional considerations were continuously ignored. This does not mean that in determining the social value of public projects

appraisal standards would be diminished. On the contrary, the introduction of welfare weights into cost-benefit analysis involves a broader and more rigorous analysis than before that proposals meet more than one objective.

With the use of, say, regional welfare weights the cost-benefit analysis will make poor districts of the European Union a more favourable venue than richer ones. The issue of regional spending is becoming even more important in Europe given the large number of countries have recently become members of the Union and more due to join in due course. There is a substantial scope for further work in relation to European regional policy and regional welfare weights in all parts of Europe to include not only the new 'poor' countries but also the old 'rich' countries containing their relatively poor regions.

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