POVERTY TARGETING CLASSIFICATIONS AND DISTRIBUTIONAL EFFECTS

Elio Londero *

Abstract

This paper reviews two common definitions of poverty targeted projects, discusses the limitations of poverty targeting classifications, calls for a poverty focused cost-benefit analysis that looks at the main policy constraints affecting the distribution of project benefits, and argues for looking at the distribution of net benefits. Finally, it offers some conclusions for the distributionally-minded applied economists.

* Inter-American Development Bank. Opinions expressed in this paper are those of the author and are not intended to represent the views of the Bank. A preliminary version of this paper was presented to the Conference on People, Projects and Poverty, held at the Development and Project Planning Centre, University of Bradford, May 6-7, 1999. Comments by Arthur Darling, Ruthanne Deutsch, Simón Teitel, and Conference participants are gratefully acknowledged.

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Elio Londero[1] *

It would be well to be quite sure
Just who *are* the deserving poor
Or else the state-supported ditch
May serve the Undeserving Rich.
Kenneth Boulding (1966)

1. Introduction

During the late seventies and early eighties, economists devoted considerable attention to the distributional effects of projects. This attention reflected long-standing concerns of applied welfare economists about the distributive implications of prescriptive judgements (Little, 1950). Closer to practice, there were attempts to bringing into the open, using cost-benefit methods, and in a form suitable for practical application in a planning context, the interpersonal and intertemporal value judgements inherent to investment decisions (Marglin, 1967). These efforts, coupled with the perception by international observers that development institutions were not reaching the poor as much as desired, led to the publication of two influential books proposing specific methodologies to bring into the open these value judgements (Little and Mirrlees, 1969, 1974; UNIDO, 1972).

The theoretical and methodological discussion about estimating interpersonal distributional effects stayed (and stays) well ahead of implementation. Initially, applied economists faced with the requirement of producing an estimate of distributional effects had very little guidance available,[2] and what was available reflected the limited experience acquired up to that moment. During the eighties,

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[2] Notable exceptions were UNIDO (1972, 1980) and Hansen (1974).

only one development institution, the Inter-American Development Bank, regularly estimated the distributional effects of the projects it helped to finance. A book presenting principles and applications was published as a result of that experience (Londero, 1987).

Nowadays, applied economists seem to be more aware of the normative importance of estimating distributional effects, and, perhaps, of its practical virtues.[3] This greater awareness has not necessarily resulted in more and better estimates of distributive effects, nor in the full use of the ensuing expertise for policy advice and policy design. In recent years there has been a reduced interest by multilateral development institutions in the distributional effects of policy measures, as well as less emphasis on cost-benefit analysis and more emphasis on non-project lending.

In the nineties, the use of cost-benefit methods has been greatly reduced and the estimation of distributional effects has been practically abandoned. Most investment is expected to result from the profit motive, and the role of the public sector is presumed to be that of creating the conditions for such investment to lead to an economically efficient outcome, as if such desirability could be established independently of interpersonal and intertemporal value judgements. Raising public revenue and expenditure decisions would also be guided by efficiency considerations, but attention would be concentrated in areas were the public-good nature of the output and the existence of externalities would result in too little private investment. Also, the role of the government is presumed to be that of protecting the poor from the market outcome, while trying to improve those labor force characteristics that the market requires.

Concerns about the ability of reaching the poor have led to promoting the design of poverty targeted interventions, in some cases leading to the dichotomous classification of projects into poverty targeted and the rest. To that effect, two not mutually exclusive definitions of poverty targeted projects seem to be in use. One is that of building into project design specific instruments to channel to the poor more benefits than would otherwise have been the case. The other requires that headcount measures of poor beneficiaries exceed a certain threshold. In both cases, it is implicitly assumed that it is sufficient to comply with these criteria, and that it is not necessary to

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[3] On the external benefits of estimating distributional effects, see Londero (1996).

estimate the distribution of project costs and benefits. This paper will examine these two classification criteria, show that compliance with them does not ensure equity in the final distribution of benefits, and argue in favor of the importance of distributionally minded economic analysis for project and policy design even when projects are "poverty targeted".[4]

The paper will also discuss the appropriation of benefits in the form of rents. There will be nothing new in this discussion. In fact, the issues have been discussed by politicians and tax authorities well before welfare economists existed, and are well known to tax specialists and administrators. But tax specialists and administrators rarely appraise projects, and project economists often ignore these issues. This discussion will set the tone for presenting the case of seemingly poverty targeted projects that generate an important share of total benefits in the form of rents that accrue to the non-poor. The role of property taxes in the project's distributional outcome will be briefly discussed.

Finally, the paper will argue for the importance of looking at the distribution of net benefits. Some alternatives to that effect will be discussed briefly.

2. Poverty Targeted Projects and Distributional Effects

The first common definition of a poverty targeted project is a project whose design includes specific instruments to channel to the poor more benefits than would otherwise have been the case. An important characteristic of this definition is that it is not concerned with the amount of benefits channeled to the poor, but only with the existence of the targeting instruments. The project may be selected according to unspecified criteria. Then, its distributional impact is "improved" through targeting. Therefore, there is no way of knowing what the effect of this approach would be on the poor without knowing the criteria for selecting the project and the impact of the distributive improvement. This definition of poverty targeting does not establish a minimum share of project benefits that should be appropriated by the poor, or a minimum additional percentage of project benefits that should be channeled in excess of those in the situation "without the targeting" for a

[4] Londero (1996) and Potts (1999) provide more general arguments for estimating distributional effects.

project to be considered targeted. Therefore, a project that provides services for the rich but includes a special arrangement to provide some services to the poor qualifies as poverty targeted, despite the fact that the majority of benefits is received by the rich. In fact, unless some thresholds complement the criterion, any instrument obtaining any additional amount of benefits to the poor would make a project poverty targeted under this definition.

The second definition is one of headcount impact. For a project to be poverty targeted it is normally asked that the percentage of poor beneficiaries exceeds a certain preestablished threshold, for example, the headcount poverty incidence in the country or region. Therefore, it would be possible for a project to qualify as poverty targeted because the number of poor beneficiaries as a proportion of non-poor ones exceeds the threshold, while the percentage of total benefits received by the poor is actually low.

In these methods, it is normally unclear how the word "beneficiaries" is defined. It has to be assumed that beneficiaries does not mean just those whose welfare improves, but rather those affected, that is, those receiving positive or negative welfare changes. Otherwise, those who lose as a result of the project would be ignored. But if losers are included, there is no indication as to how to treat them. Should the number of losers be deducted from the number of gainers according to poverty level? This vagueness in defining what is meant by beneficiaries manifests itself when looking at the cost side of the project, since it is also obscure how to treat beneficiaries such as workers receiving wages that exceed their compensating variation for accepting the job.

It would be perfectly possible for a project to be poverty targeted according to any of the above definitions and to have fewer beneficiaries, or deliver less benefits to the poor, than the alternative course of action. In other words, it would be possible for the project to have negative net poor beneficiaries, or for the poor to receive negative *net* benefits. If the aim is to increase the welfare of the poor, the analyst should look at the distributional effects of public investments in net terms, that is, the difference between what would be obtained with the project less what would have been obtained with the alternative course of action (Londero, 1987). While this is more easily said than done, the use of headcount measures combined with ignoring the distributional effects of the alternative course of action may result in increasing poverty when compared with the alternative

course of action.

Three conclusions are warranted. First, it is unclear what is the meaning of poverty targeted when the preceding definitions are used as instruments to select projects that are expected to contribute to poverty reduction. Second, headcount-based measures of poverty targeting say very little about the distributional effects of public actions. Third, measures of distributional effects should take into account the distributional effect of the alternative course of action; this issue will considered in section 5 below.

3. Projects, Rents, and Distributional Effects

Conventional applied welfare economics has emphasized the measurement of costs and benefits when outputs are subject to market transactions.[5] In most of these cases, market competition eventually leads to the elimination of temporary rents (or *quasi rents*) and benefits are finally enjoyed by the population at large according to expenditure levels and patterns. But such is not the case in all projects. There are many cases in which the appropriation of benefits is determined by the ownership of a non-reproducible asset, such as land. In those cases, competition would not transfer the additional benefits to the population at large through prices. Rather, these benefits would be finally enjoyed by property owners in the form of additional rents. Such is the case, for example, of an irrigation project that increases the productivity of intramarginal farms. The unit production costs of these farms would be reduced by the project, while market prices would remain unaffected, since they are determined by the marginal producers, who would not be affected by the project (Londero, 1987, Chapter 7).

When benefits of irrigation projects are appropriated by the intramarginal producers as rents, the method traditionally used to estimate benefits, that is the incremental farm budgets, measures benefits at the point where they will be appropriated. As a result, there is a direct connection between measuring benefits and estimating their distribution. Instead, if the farms in question are

[5] On methods of measuring costs and benefits associated with goods that are not directly the subject of market transactions see, *inter alia*, the exchange of views in *The Journal of Economic Perspectives*, Vol. 8, No. 4 and the references therein.

at the margin, farm-gate prices will decline and benefits are likely to be transferred forward through prices, and eventually reach the consumer. In such a case, the marginal farmers should not be considered the beneficiaries, since they do not appropriate the benefits. Moreover, intramarginal farmers lose as a result of the project due to the price reductions. If benefits are passed on to the consumers through prices, the distribution of benefits according to income levels will depend on the specific agricultural products, and primarily on expenditure shares on these products, rather than on the distribution of farms according to productivity and size.

In other cases, the point at which benefits are measured differs from the point at which benefits are appropriated, and both differ from the point at which final transactions take place. That, for example, would be the case of freely accessible urban roads.[6] Efficiency benefits of road projects are normally measured by estimating time and vehicle operating cost savings,[7] but most of these savings are not appropriated by vehicle owners. In the case of a major route, passing cargo vehicles originate normally in a variety of locations. Thus, it is likely that benefits would be appropriated similarly to the irrigation of marginal farms, and would mostly be reflected in final price reductions. In the case of an urban road, local traffic will enjoy cost and time savings according to the origin and destination of the trip, making location the dominant characteristic for benefit appropriation. Therefore, it is landowners, rather than transporters, producers or consumers, who receive a significant part of the benefits through the prices commanded by their properties.[8]

There is ample evidence about the capturing of benefits by land owners. In studying the effects of transportation improvements on land values, McDonald and Osuji (1995) found that not only adjacent land values increased substantially due to the specific improvement, but also that land markets anticipated the benefits derived from its construction. Also, Haughwout (1997) found that benefits of infrastructure investments in central cities are partially captured by suburban land owners.

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[6] Tolls would capture part of the benefits.

[7] In some cases, the reduction in the probability of accidents is also included.

[8] Note that of course some of this landowners may also use the road, but it is their land ownership, rather than their vehicle ownership, what determines the appropriation.

Voith (1993) shows that suburban land values increase over time as cities continue to grow. Finally, Haughwout (1997) found that property taxes were (more than) fully capitalized in property values.

These distributional effects may not be the result of error or insufficient information. Publicly financed roads are often built to develop urban land previously acquired by rent seeking entrepreneurs speculating on land values, who in turn finance political campaigns, particularly at the local level. It may be argued that such political relations reduce the incentives for politicians to pursue poverty focused distributional goals.

The economist knows that increased property values in the area of influence of the road should not be added to time and cost savings benefits because it would amount to double counting (Mohring, 1961; Harberger, 1972). Increased property values reflect the already computed time and cost savings. The economist is also aware that transportation projects generate distributional effects of the type described,[9] but is often instructed not to worry about the distribution of those benefits, since distributional considerations are ignored in efficiency analysis and would be addressed by fiscal policy. Whether fiscal policy addresses these distributional concerns does not seem to be the business of the project economist.

Urban roads is not the only case where these issues arise. A similar case is that of freely provided public education when quality varies significantly among schools. Here also the demand for the characteristic is associated to location, and at least part of the benefit may be appropriated as a locational rent. Therefore, in the absence of taxes capturing these rents, not all benefits of such education would be appropriated by students.[10]

Some poverty targeted projects generate benefits appropriated by the non-poor that may be comparable in amount to the benefits captured by those targeted. Urban development projects are one of these cases. Consider the case of slum relocations, which would be classified as targeted to

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[9] See Mohring (1961) and references therein. For an early study of distributional effects of road investment, see Dalvi and Nash (1977), who recognized the importance of land property in the appropriation of benefits but did not attempt to estimate these effects; see pp. 202-203

[10] For evidence on the capitalization of education benefits see *inter alia* Hayes and Taylor (1996), Bradbury, Mayer and Case (1997), and Black (1999).

the poor under both definitions discussed. First, because only slum dwellers would receive new housing that would not have been received otherwise. Second, because headcounts are likely to show that a high share of these dwellers are poor. However, these projects may also have external effects captured through land ownership, and thus have significant distributional effects for the non-poor.

Historically, when the poor acquired the possession of urban land, they selected the best available: close to employment opportunities and transportation. What could have been marginal land at the time, has become in many cities prime real estate today. The relocation of those slums not only would allow landowners – many times the government– to extract the rents assigned to them by law, but also to generate significant increases in the market value of the surrounding properties.[11] In many cases, the rents generated by the relocation to owners of the land where the slums are located and to surrounding landowners may be comparable in magnitude to the benefits of the additional housing provided to the relocated dwellers. The economic analysis of these projects, however, frequently ignores these benefits to landowners, and does not discuss the existence and effectiveness of instruments to publicly capture those rents.

To a large extent, cost-benefit practice has not aimed at capturing the distribution of benefits when land property is an important determinant of the ensuing distribution. The fact that the current state of the art does not provide with reliable ways for estimating such effects may be one of the reasons behind this omission. However, even under the rules of efficiency analysis, and even when no cost-benefit analysis is conducted, distributional concerns would require project economists to assess the government's ability and willingness to capture rents, as well as to explore policy options to that effect. In most instances, such assessment would require for the project economist to get involved in the inner workings of the tax system. In the absence of effective instruments for the government to capture these rents, the efficiency analysis of such investments becomes a silent accomplice to the private appropriation by landowners of a significant share of public investment benefits.

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[11] Similar considerations apply to improving existing slums.

It is possible to obtain a simple rule of thumb for checking whether the existing property tax, if enforced, is capable of capturing the rents generated by the project. Say that the increase in the value of property i is ΔV_i, that fiscal valuations are a proportion α of market values, and that the tax rate is t. Then, the present value of the yearly tax collections from property i, T_{it}, over an infinite horizon would be

$$PV(T_{it}) = \Delta V_i \, \alpha \, t / d \qquad [1]$$

where d is the discount rate. The tax rate that enforced would yield a present value equal to the increase in the value of the property [$PV(T_{it}) = \Delta V_i$] would be $t = d / \alpha$. In numbers, if the official valuation is 80 percent of the market value and the discount rate is 3 percent, the tax rate should be not smaller than 3.75 percent. Expression [1] assumes full compliance. Enforcement differs from valuation in that it is an owner-by-owner issue, and it is thus not amenable to be incorporated as an average compliance rate in a general formula to be applied to specific cases, like the one presented. If there were less that full compliance, the government would be faced with the decision of increasing compliance, increasing the tax rate, or foregoing part of the revenue (that is, granting part of the rents). What is important to note is that the amount of benefits yearly redistributed to the government by the property tax would depend on property valuations, tax rates, and evasion rates. The project economist may present the issues and explore the consequences of alternative courses of action.

When rents are a significant part of project benefits, a distributionally-minded project analysis should point out the nature of these rents, discuss their approximate quantitative importance, identify the beneficiaries, and analyze whether there are means in place for capturing those rents, and whether the existing ones are enforced and sufficient to effect the redistribution. Finally, alternative policy interventions and their expected effects should also be discussed.

4. A Simple Example

Consider an example in which the government relocates a slum located in a plot of its own property,

paying the construction costs, and purchasing the necessary land at market price. For simplicity, it is assumed that these costs are the only ones involved, that market prices equal efficiency prices, and that there are no transfers to record from the efficiency pricing. Houses are provided at a price below demand price. The government receives the corresponding amount, and regains possession of the land valued at its market price. The resulting net changes for the government are summarized in Table 1.[12]

Table 1. Distributional effects of slum relocation (hypothetical example)
(in thousands of US$)

	Slum dwellers	Government	Surrounding Land Owners	Urbanized Land owners	Total
Net willingness to pay (new houses less old)	15000				15000
Paid (new houses)	−7500	7500			
Construction costs		−12750			−12750
Land purchases		−2250		2250	
Willingness to receive				−2250	−2250
Increase in land values				3700	3700
Recuperated land		6000			6000
Market value of surrounding land			11000		11000
Total	7500	−1500	11000	3700	20700

Source: According to explanation in the text. Also see Appendix B.

The slum dwellers gain their net willingness to pay for the new houses, that is, their valuation of the new housing in excess of their valuation of the old ones in the relocated slum. The owners of the land surrounding the slum gain the additional value of their properties, an external effect of relocating the slum. Finally, the owners of the land where the new houses are located gain the

[12] Appendix A provides a more formal presentation, and Londero (1987) presents the general method employed in this section.

increase in property values resulting from the urbanization.[13]

Equal welfare weights for all affected allow the columns to be added horizontally to obtain the Total column, which indicates the net benefits at efficiency prices of the project.[14] These net benefits are the willingness to pay for the additional housing provided, less the costs to provide it (land, plus construction costs), plus the value of the land where the slums were located, plus the change in land values in the areas surrounding the old slum and surrounding the new development.

It is conceivable that the benefits accruing to landowners (including the government) would be of comparable magnitude to the benefits accruing to the slum dwellers, particularly because the surrounding land often has more area than the land occupied by the slum. Given the incidence of benefits, the project could be considered a housing project for the poor, as well as a land "improvement" project for the non-poor. Relocation costs, land values and increases in these values assumed in the example are within the limits of experience. The project is assumed to pass the cost-benefit test when willingness to pay for the incremental housing services is the only benefit computed, as is frequently the case. The government is assumed to recover fifty percent of the cost of providing the new housing. Increases in land values of the surrounding areas (both the original slum and the new development) are estimated as 33 percent for the first 100 m radius ring, 18 percent for the following 100 m ring, and 11 percent for the third 100 m ring.[15] The value of the land occupied by the slum is assumed to be five times the value of the land where the slum-dwellers are relocated, and no price increase of the land acquired by the government is computed. The effects on public utilities, urban transportation services and other parts of projects like this have been

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[13] It could be a decrease if the relocation reduces rather than increases land values. Other possible changes in land values are presented in Appendix A.

[14] For the sake of simplicity, it is assumed that the rate of discount equals the marginal return of investment, and therefore the analysis need not be concerned with different valuations of consumption and investment (UNIDO, 1972).

[15] Note that a 33 percent increase in the value of the land amounts to a smaller percent increase in the value of the property. If land is 20-30 percent of the value of the property, that 33 percent would amount to an 6.7-10 percent increase in total property value.

omitted for the sake of simplicity.

The results show what urban developers have always known: that many so-called urban development projects, when looked at from the point of view of the appropriation of benefits, are primarily large real estate operations. It may be concluded, therefore, that designating projects like the one described as primarily benefitting the poor should be preceded by a careful estimation of their distributional impact. Further research, particularly ex-post evaluations of benefit appropriation through land ownership (e.g., Boyce et al., 1976; Haughwout, 1997; McDonald and Osuji, 1995), would be useful for the understanding of the distributional effects involved in this type of projects.

An important determinant of that distributional outcome would be the existence and enforcement of tax instruments for the government to capture the additional rents generated by the public project. That would be, for example, the case of a property tax, assumed away thus far in the preceding example. Such a tax would reduce the benefits to landowners by the present value of the additional tax revenue, increasing the benefits received by the government by an equivalent amount (net of any incremental collection or efficiency cost; see *inter alia*, Sandmo, 1998).

5. The Distribution of Net Benefits

The results presented in Table 1 show who bears most of the costs and who receives most of the benefits of the slum relocation project in the absence of government instruments to capture the increases in property values. These tables do not indicate, however, the net effect on these groups of persons, that is, the results of what they obtain from the project less what they would have obtained with the alternative course of action. Identifying such alternative course of action is the first step towards estimating their net benefits.

The slum relocation project is a government decision about the financing and allocation of expenditures. Therefore, it is the alternative use of such funds what would constitute the "situation without the project". Three pure alternatives come to mind: not increasing taxes to finance the project, returning taxes that have already been collected, and reducing other expenditures. In practice, taxes are seldom returned, and the level of revenue is rarely determined by the desired level of investment at the project level. More frequently, alternatives at the project level are whether to

finance one project or another, or, sometimes, they are about the sequencing of investments that would be made one way or the other.

If the alternative course of action were another project, the net benefits to those affected would be the costs and benefits recorded in Table 1, less the cost and benefits that would have been obtained with the alternative project. Say that the displaced project is for the provision of services to the poor with the distribution of costs and benefits presented in Table 2. In such case, the net benefits to poor beneficiaries of relocating the slum would be negative, since what they obtain with the project is less than what they would have obtained with the displaced project. The benefits to the non-poor, instead, constitute the foundation of the net efficiency benefits of the slum relocation.

Table 2. Net distributional effects of the slum relocation
(in thousands of US$)

Beneficiaries / Project	Poor	Government		Non-poor	Total
		Investment	Other		
Slum relocation project	7500	−15000	13500	14700	20700
Alternative investment	−11000	−(−15000)	−13500	−	−9500
Net benefits	−3500	−	−	14700	11200

Source: Table 1.

What initially appeared to be a poverty targeted project, and later on a housing/land improvement project, turned out to be, after estimating the distribution of costs and benefits, one which, in the absence of government instruments to tax rents, provides significant net benefits to the non-poor, and negative net benefits to the poor. The reader may verify that the distribution of the net benefits changes dramatically if a property tax captures the benefits capitalized in land values.

Net benefit estimates are highly sensitive to the distributive effects of the alternative course of action, which is not normally known with a high degree of certainty. Additionally, the stock of alternatives is not independent of government revealed distributive preferences. Project formulators respond to incentives and reflect these government preferences in their identification of potential projects.

There is little experience in trying to identify the distributional effects of alternative courses of action. At the level of the displaced projects, experience indicates that projects are incorporated to the budget taking into account the relative power of the respective constituencies. The poor frequently do not have the political power to press the government to pursue their interests at the project level. As a result, the percentage of benefits to the poor of marginally displaced projects tends to be relatively high.

Difficulties to establish the counterfactual should not prevent economists from attempting to provide tentative figures regarding net benefits. The average incidence of taxes, for example, would constitute a starting point. If any effort to improve the welfare of the poor is being made, it would be expected that, on the average, projects would have *at a minimum* a positive net benefit to the poor when compared with tax incidence. It should be noted that such effect may be obtained with the combination of a low percentage of benefits to the poor and a high amount of total benefits. While improving the situation of the poor relative to a situation without taxes and the associated projects, this approach may lead to a more unequal distribution of welfare.

A second, more demanding criterion may require that the *share* of benefits to the poor resulting from all projects in one year exceeds the poor's share in average tax incidence. This criterion includes the preceding one as long as the net benefits of the project are positive, and contributes to greater equity in the distribution of total welfare.[16] This seems to have been implicitly in the mind of the so-called "Washington consensus",[17] since the recommendations on public expenditure referred to "the potential to improve income distribution" (Williamson, 1997, p. 61).

The shortcomings of the preceding approaches are well known. In practice, the counterfactual to a project decision is often another project decision, since marginal rates of return rarely are close to notionally accepted rates of discount, and since accounting prices of investment are not used. In such situations, neither criterion provides any guidance as to what would be the

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[16] Tax incidence is normally measured in reference to income, rather than welfare. Therefore this assertion should be qualified accordingly.

[17] For a review of the alleged "consensus", see Williamson (1997) and ensuing comments.

minimum amount of net benefits that should be sacrificed in order to obtain one additional unit of benefit for the poor.[18] The second criterion does not state how much higher the poor's share ought to be, neither does it provide any guidance as to tax incidence. Rather, it seems to take tax incidence as a *datum* and tries to improve from there, thus sanctifying the distributional value judgements implicit in the tax code cum enforcement.

A more theoretical, and certainly more consistent point of view, argues that tax and expenditure decisions are policy decisions by the government, and therefore should be the result of applying the same welfare function. Therefore, the size of the government, the tax instruments to finance it, and the shadow prices reflecting government preferences should be the outcome of the same maximizing exercise (Sandmo, 1998). While this approach is clearly better conceptually, it is less clear how it could be implemented.

In any of these cases, the responsibility for estimating the distributional effect of the alternative course of action is outside the scope of work of the project economist. It would be the responsibility of the project authority to request it, and probably that of the fiscal or planning authority to provide it.

Regardless of the position with respect to these and other proposals, it is clear that a proactive stance in channeling benefits to the poor requires more than estimating the distributional effects of the project. It requires to focus the attention on the distribution of net benefits. This approach would bring the project economist closer to the discussion of the distributional implications of tax and expenditure policies.

6. Conclusions

Headcount definitions of poverty impact are not clear as to who should be considered "beneficiaries". Therefore, the application of these definitions may result in inconsistent operational criteria, and may provide incorrect headcount figures of those affected by the project.

Headcount definitions of poverty impact are misleading when compared to measures based

[18] Specifying such trade-offs implies the definition of distributional weights, and therefore a welfare function.

on estimating costs and benefits according to standard applied welfare economics methods. Therefore, headcount-based classifications of projects as poverty targeted should not be expected to convey any information on the distributional effect of the "targeted" project. In fact, a project may be poverty targeted according to any of the definitions presented in this paper and have regressive welfare effects as measured conventionally.

When the estimation of benefits is possible, estimating the distribution of project costs and benefits would provide a much more accurate description of distributional effects than head counting. A complete description requires estimation of the net impact. Measuring net effects requires knowledge of the distributional effects of alternative courses of action, leading into the analysis of tax and expenditure decisions from an applied welfare economics perspective.

The methods used to quantify total efficiency benefits may differ from the ways benefits are finally appropriated. As a result, an estimate of distributional effects based on methods designed to capture efficiency benefits may lead to error.

Projects often provide benefits that are captured through land ownership and reflected in the value of land. The distributional effects of many projects, but particularly of those generating rents, are determined by tax policy towards the value of non-reproducible assets. Whenever a significant share of the benefits of a project are appropriated by asset owners in the form of higher asset prices, the distributionally-minded analyst should point that out and discuss the effects of current and alternative tax policies.

Ex-post evaluation studies of projects affecting assets values, using cost-benefit methods and focused on these effects on the value of assets, would contribute to the understanding of the distributional effects of these projects. Such understanding will be useful in the design of projects and policies aimed at reducing poverty and improving distribution.

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Appendix A. Distributional Effects of Relocating the Slum

Consider the example depicted in Figure 1. The government relocates a slum located in plot GL_0 of its own property –Figure 1(a)–, paying the construction costs *CC*, and purchasing land $\Delta HL = HL_0 - HL_1$ at market price p_1^{HL} –Figure 1(b). For simplicity, it is assumed that these costs are the only ones involved, that market prices equal efficiency prices, and that there are no transfers from the efficiency pricing to record. Houses are provided at price p_0^g, below demand price p_0^d –Figure 1(c). The government receives the corresponding amount, and regains possession of the land GL_0 valued at its market price p_0^{GL}. The resulting net changes for the government are summarized in Table 3.[19]

The slum dwellers gain their net willingness to pay for the new houses, that is, their valuation of the new housing in excess of their valuation of the old ones in the relocated slum. The owners of the land surrounding the slum (SL) gain the additional value of their properties –Figure 1(d)–, an external effect of relocating the slum. Finally, the owners of the land where the new houses are located gain the increase in property values resulting from the urbanization.[20]

Equal welfare weights for all affected allow the columns to be added horizontally to obtain the Total column, which indicates the net benefits at efficiency prices of the project.[21] These net benefits are the willingness to pay for the additional housing provided, less the costs to provide it (land, plus construction costs), plus the value of the land where the slums were located, plus the change in land values in the areas surrounding the old slum and surrounding the new development.

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[19] Londero (1987) presents the general method employed in this Appendix.

[20] It could be a decrease if relocating the slum to that area reduces rather than increases land values. For other effects on land values see below.

[21] For the sake of simplicity, it is assumed that the rate of discount equals the marginal return of investment, and therefore the analysis need not be concerned with different valuations of consumption and investment (UNIDO, 1972).

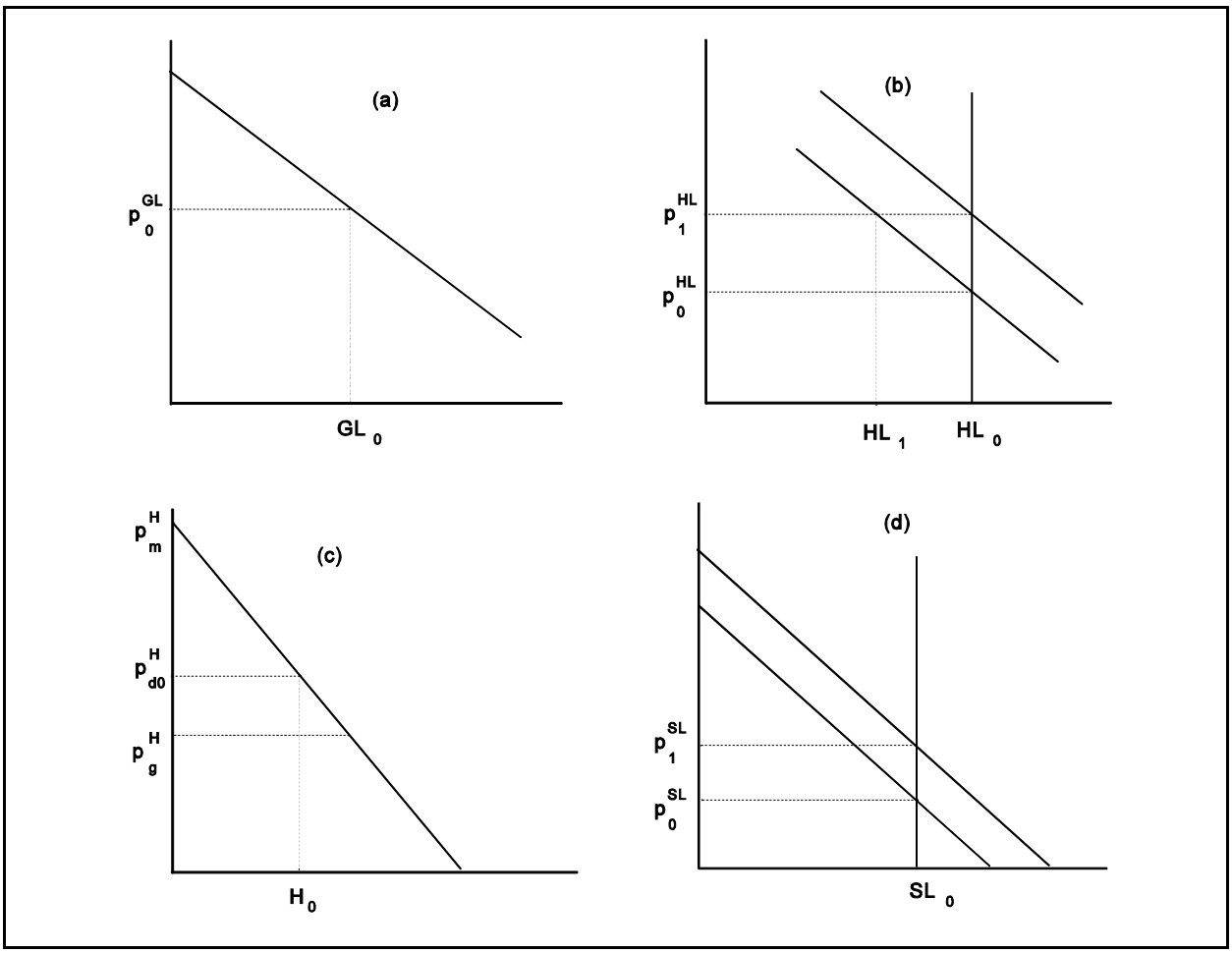

Figure 1. Main effects of a slum relocation project

There may be some other important effects resulting from the additional amount of land at the disposition of the government, and from the increase in the quality of the land surrounding the slum. Say that there are three types of land (A, B, and C), with markets as depicted in Figure 2. Relocating the slum would provide the government with an additional quantity of type A land ($L_1^A - L_0^A$), and change the classification of the surrounding land from type B to type A ($L_2^A - L_1^A$). As a result, there would be an additional supply of land A composed by the sum of these two quantities, and the price of such land would fall ($p_0^A - p_2^A$). Similarly, the supply of land B would decrease ($L_2^A - L_1^A = L_0^B - L_1^B$), and its price would increase as a result.

Table 3. Distributional effects of slum relocation

	Slum dwellers	Government	SL owners	HL owners	Total
Net willingness to pay (new houses less old)	$\frac{1}{2}(p^H_{d0}+p^H_m)H_0 + p^H_{d0}H_0$				$\frac{1}{2}(p^H_{d0}+p^H_m)H_0 + p^H_{d0}H_0$
Paid (new houses)	$-p^H_a H_0$	$p^H_a H_0$			
Construction costs		$-CC$			$-CC$
Land purchases		$-\Delta HL p^{HL}_1$		$\Delta HL p^{HL}_1$	
Willingness to receive				$-\frac{1}{2}(p^{HL}_1+p^{HL}_0)\Delta HL$	$-\frac{1}{2}(p^{HL}_1+p^{HL}_0)\Delta HL$
Increase in land values				$(p^{HL}_1-p^{HL}_0)HL_1$	$(p^{HL}_1-p^{HL}_0)HL_1$
Recuperated land		$GL_0 p^{GL}_0$			$GL_0 p^{GL}_0$
Market value of SL_0			$(p^{SL}_1-p^{SL}_0)SL_0$		$(p^{SL}_1-p^{SL}_0)SL_0$
Total	$\frac{1}{2}(p^H_{d0}+p^H_m)H_0 + (p^H_{d0}-p^H_g)H_0$	$p^H_g H_0 - CC - \Delta Hl p^{HL}_1 + GL_0 p^{GL}_0$	$(p^{SL}_1-p^{SL}_0)SL_0$	$\Delta p^{HL} HL_1 + \frac{1}{2}\Delta p^{HL}\Delta HL$	$\frac{1}{2}(p^H_{d0}+p^H_m)H_0 + p^H_{d0}H_0 - CC - \frac{1}{2}(p^{HL}_1+p^{HL}_0)\Delta HL + GL_0 p^{GL}_0 + (p^{HL}_1-p^{HL}_0)HL_1 + (p^{SL}_1-p^{SL}_0)SL_0$

Source: Figure 1.

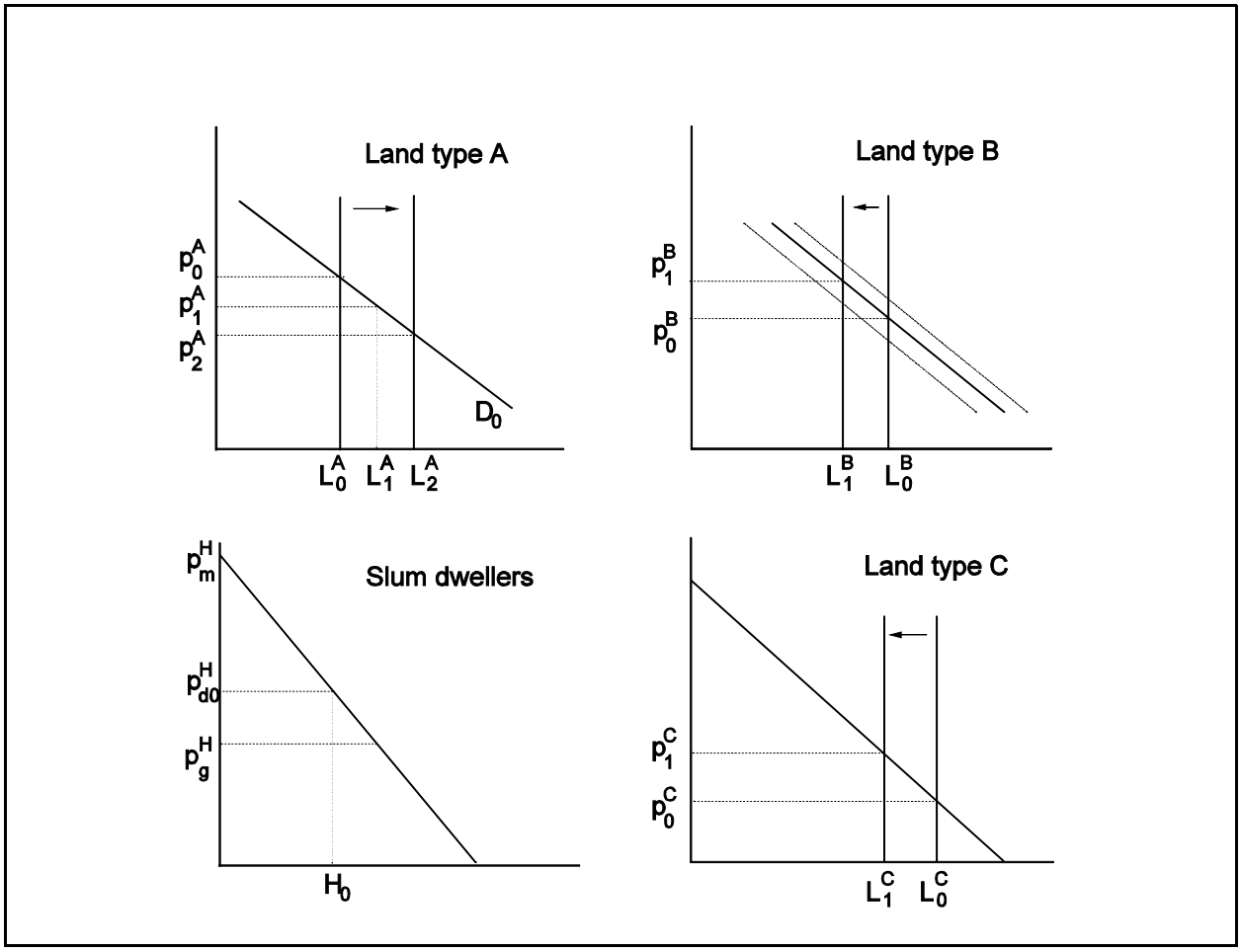

Figure 2. Additional effects of the slum relocation project

Lands of different types are likely to be close substitutes with those of similar quality. Therefore, the reduction in the price of land A may reduce the demand for land B, and the increase in the price of land C where the slum is relocated may increase the demand for land B (marked with broken lines in Figure 2, Land type B). These effects would lead to further distributional effects.

It may be argued that these changes in the supply of land A and B are very small in comparison to total supply, and therefore the associated price changes are also very small. Such may be the case, but small price changes would be multiplied by large quantities resulting in income

changes of comparable size with those registered in Table 1.[22]

The equivalence between the notation of Table 1 is the following: the additional land for the government is valued at its sale price $p_0^{GL} = p_2^A$, the increase in the value of the surrounding land is $p_1^{SL} - p_0^{SL} = p_2^A - p_1^B$, and the increase in the value of the land where the slum is relocated is $p_1^{HL} - p_0^{HL} = p_1^C - p_0^C$.

Appendix B. The Numerical Example of Table 1

The slum is assumed to hold 1,000 families occupying a circular area of 40,000 m^2, represented by the circle at the center of Figure 3. The corresponding radius is thus 113 m. The surface of the first 100 m surrounding ring would be the surface of a 213 circle less the 40,000 m^2 of the slum. That is, $\pi \times 213^2 - 40{,}000 = 102{,}531$ m^2. The surface of the second ring is $\pi \times 313^2 - 142{,}531 = 165{,}248$ m^2. Finally, the surface of the third ring is 228,080 m^2. The land where the slum is located is assumed to cost \$150/m^2 without the slum, that is a total of \$6,000,000. As a result of the slum, the surrounding areas lose 25% of its value for the first 100 m, 15% for the following 100 m and 10% for the third and last 100 m. Therefore, the unit values of the land with and without the slum are:

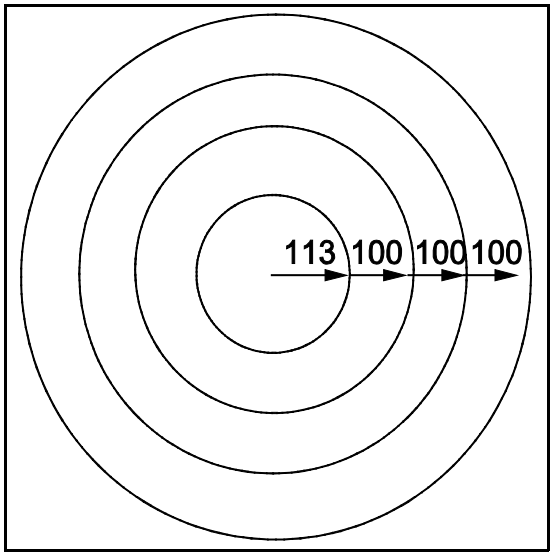

Figure 3.The slum and surrounding areas

	With the slum	Without the slum	Appreciation
First ring	112.5	150	37.5
Second ring	127.5	150	22.5
Third ring	135.0	150	15.0

[22] See Wildasin (1988).

The resulting total appreciation would thus be

$$102{,}531\ m^2 \times \$37.5/m^2 + 165{,}248\ m^2 \times \$22.5/m^2 + 228{,}080\ m^2 \times \$15/m^2 = \$10{,}984{,}193$$

or roughly eleven million in Table 1.

In the slum, each family occupies an average of 30 m^2, plus 10 m^2 of common areas. The slum dwellers are relocated to units occupying 50 m^2, plus 25 m^2 of common areas, or a total of 75 m^2 per family. Therefore the total area of the new development is 75,000 m^2. The unit cost of the land where the slum is relocated is assumed to be only one fifth of the released land, or \$30/m^2 for a total of \$2,250,000. It is assumed that the slum is relocated to undeveloped land, which would increase its value as a result of the urbanization. Therefore, and following the same method used for the slum area, three concentric rings of 100m increase their values in 33.33%, 27.65% and 11.11%, respectively. The radius of a circular surface of 75,000 m^2 is 154.5 m. Therefore, the surface of the concentric circles are:

$$\pi \times 254.5^2 - 75{,}000 = 128{,}482\ m^2$$
$$\pi \times 354.5^2 - 203{,}482 = 191{,}323\ m^2.$$
$$\pi \times 454.5^2 - 394{,}805 = 254{,}154\ m^2.$$

and the resulting increases in land values are:

$$\$10.0/m^2 \times 128{,}482 = \$1{,}284{,}820$$
$$\$5.36/m^2 \times 203{,}482 = \$1{,}090{,}663$$
$$\$3.33/m^2 \times 394{,}805 = \$1{,}314{,}700$$
$$\text{Total} = \$3{,}690{,}183$$

or approximately \$3.7 million in Table 1.

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