MEASURING BENEFITS, TRACING DISTRIBUTIVE EFFECTS, AND AFFECTING DISTRIBUTIONAL OUTCOMES

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Abstract

This paper shows the differences between how benefits are estimated and how they are distributed, calls attention to the policy variables that are crucial in explaining certain distributional outcomes, explores the importance of looking at the demand for characteristics when trying to benefit the poor, and suggests areas for research.

1. INTRODUCTION

Most of the teaching and practice of cost-benefit analysis is focused on efficiency analysis, which is conducted under the value judgement that an additional unit of income is equally valuable for all affected; in particular, regardless of the income of the beneficiary. Within the boundaries of efficiency analysis it is only important to know whether the algebraic sum of the money measures of welfare changes to all affected is positive. As a result, many economists become interested in the total amount of costs and benefits, disregarding who gets how much of the total. These costs and benefits are estimated by the easiest way to achieve an accurate measurement of that total, and most of the times this way is based on the generation of those costs and benefits.

Measuring costs and benefits at the point they are generated may not be the best approach to understand the rules and the processes by which these costs and benefits are distributed among all affected. Understanding those rules and processes are however important for assessing distributional effects and for affecting distributional outcomes at both the project and the policy levels. The strategy of the paper is to use well-known examples to show the scope and limitations of interventions at the project level and to call attention to the importance of the policy context.

An example, improving an urban highway, will be used to emphasize the idea that the methods employed for estimating efficiency costs and benefits do not necessarily help in

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understanding how these costs and benefits are actually distributed. Appropriation mechanisms will be explored in order to examine whether and how the ensuing expected distribution could be changed by policy. The discussion will illustrate the fact that understanding how benefits are appropriated helps not only to estimate distributional effects, but also to identify the instruments available to change these effects and to assess how distributional outcomes could be changed by policy. The discussion of instruments to affect distributional outcomes of public investments will pay special attention to the role of prices and property taxes, as well as the importance of thinking in terms of net benefits.

After reviewing the limitations of what can be done to benefit the poor within the boundaries of a given project, the attention will turn to the demand for characteristics and what can be done by incorporating what the poor demand at the level of project identification and design.

The discussion of alternative measures to attain a different distributive outcome will take place under efficiency criteria. This should not be construed as advocating its use. It is rather the result of expediency due to the ensuing simplicity in exposition. The general argument presented in this paper would continue to hold with a welfare function that favors the poor, and in the worst case scenario it would allow for a better discussion of the options before the weighting of costs and benefits (Londero, 1987).

2. MEASURING BENEFITS AND TRACING DISTRIBUTIVE EFFECTS

In most projects, benefits are measured at the point they are generated. In an irrigation project, additional production less additional costs are measured at the farm level. Travel cost savings of an interurban road are measured at the vehicle level. However, the fact that benefits are more easily measured at the point they are generated does not mean that they are appropriated at that level. The price effects of the additional production may imply that only a small share of total benefits are retained at the farm level, but even when most of these benefits are retained, it is the landowner rather than the farmer who may be the primary beneficiary. Similarly, travel cost savings by commercial vehicles may not be appropriated by the vehicle owner since competition would transfer these savings forward through prices.

There are some special additional difficulties associated to tracing distributional effects. In

addition to the more conventional skills required by efficiency analysis, the economist is asked to understand the rules and processes that govern how costs and benefits of different projects are finally appropriated. Understanding these rules and processes are not only important to estimate distributional effects under given conditions, but also to understand how those rules and processes may be altered to steer distributional effects in specific directions.

2.1 Improvements to Urban Highways

Consider an urban highway without tolls that is used exclusively by people living along the highway who travel to and from a large downtown area where most employers are located. As business activity in the downtown area and the surrounding population grow, the highway becomes more congested and travel costs increase. A project to reduce congestion and thus lower travel costs is proposed and the project economist calculates the benefits of improving the highway by estimating the travel cost savings attributable to the improvement, as well as the efficiency value of its environmental effects such as increased pollution due to increased traffic. Traffic projections with and without the project and estimated vehicle operating cost savings and time savings are used to calculate the so-called benefits to normal, diverted and generated traffic.[1]

Vehicle owners and bus riders seem to be the main beneficiaries of the project as long as bus savings are passed on to users through fares, since these users pay the costs that would be reduced with the improvement. However, while benefits are directly experienced by users in the form of reduced travel costs, the attribute of being a user may not be sufficient to appropriate most or even any of these benefits. Travel costs to and from work are a primary consideration in selecting where to live, and therefore an important determinant of the demand for urban land, since the demand for reducing travel time by car cannot be separated from the demand for land. Reducing these costs for one area makes it more attractive to buyers and renters who are willing to pay more for properties with the characteristic of a lower travel cost. As a result, landowners gain higher rental values for their properties – an increase in locational rents (net of additional environmental costs).[2] Therefore,

1. To simplify the presentation, other effects are omitted.

2. See, inter alia, Mohring (1961), Boyce, Allen and Tang (1976), and Voith (1993, 1999).

only those highway users that are owners at the time of the improvement could capture a significant amount of the benefits and those benefits would accrue to them because of their land ownership, rather than their use of the highway. Those renting would experience an increase in their rental prices that would reduce or eliminate their travel-cost savings. Those buying after the improvement has taken place would pay higher prices for the land, prices that capitalize most of the present value of the savings;[3] that is, future riders would not benefit that much, if at all, since lower travel costs would be offset by higher land values. In sum, since the benefits can only be enjoyed by living in the proximity of the highway, it is the ownership of the dwelling, rather than the use of the highway, what determines the appropriation of the benefits.

But landowners of developed land along the highway are not the only beneficiaries; moreover, they may not even be the main ones. Another important group of beneficiaries are the owners of undeveloped land in the outskirts of the city and along the highway, since the improvement reduces travel costs for these remote areas as well, allowing for the conversion of agricultural land into urban developments. Since land developers know better than anybody else that they can appropriate the benefits of highway improvement, they buy the land in anticipation of the highway and then lobby the local authorities for the improvement, knowing that it will have the support of the owners along the highway.[4] In addition, new development generates a demand for local road improvement the satisfaction of which is difficult to avoid once the land has been developed and that is normally paid, at least in part, out of government revenue. As the improvement reduces travel costs and new land is developed, highway traffic increases again and with it travel costs for the owners in the situation without the project, thus transferring a significant share of the benefits to the land developers. These simple distributive facts explain why in many countries land developers are among the most generous 'donors' to local political campaigns.

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3. In fact, land prices anticipate travel-cost savings. See McDonald and Osuji (1995).

4. The political constituency of the project is powerful. The riders that are not landowners are likely to favor the improvement, since they would rarely be able to estimate the final incidence of the improvement. Existing landowners along the highway, as well as developers of the more distant land, would also support the improvement because it raises the value of their properties. In the absence of the project, travel cost increases would force firms to start transferring their offices elsewhere, thus reducing traffic or its increase, as well as the values of downtown properties. Therefore, downtown landowners are another group of supporters. With such an important constituency, it is apparent why urban roads are so important for politicians.

2.2 The Role of Prices

Travel costs are the sum of vehicle operating costs, time costs and tolls paid, and a toll would significantly alter the distribution of benefits in favor of the government.[5] If charged as a flat rate at the entrance of the city, it would capture a share of the time and operating cost savings of the old residents along the highway as well as from the new users living in the newly developed land. The higher the toll, the higher the travel costs, the lower the traffic and the travel cost savings for each traveler, and the lower the share of benefits that would be enjoyed by both the old landowners and the developers.

Note the importance of the timing of the announcement of the instauration or increase of the toll and its level. If the toll level in the situation with the project is known before land transactions take place, land developers would be able to appropriate a smaller share of the benefits. On the other hand, if the decision on or the information regarding the establishment or the increase of a toll is withheld until the land is sold to the final user (e.g. homeowner), a significant share of the benefits will be appropriated by developers. Moreover, the new toll would represent a loss to residents of the newly developed area, and therefore a loss to the beneficiaries of the highway, since they would have bought their properties under the assumption of no or a lower toll.

A fixed toll (independent from distance) would capture a higher share of the benefits to those living closer to downtown (i.e. the old residents), since their total travel-cost savings would be lower. For people that live further away, a fixed toll at the entrance of the city would represent a smaller share of their travel-cost savings the further away they live. In other words, a fixed toll charged at the entrance of the city would capture a share of the benefits that declines with distance from the city, allowing developers to still appropriate a part of the benefits. Only charging by distance would allow the government to capture a more even share of travel cost savings to each traveler and thus a higher share of the benefits to developers. If the toll were to equal the travel cost savings, and its level were to be announced before land transactions take place, the government would capture all of the benefits (at that toll level), land would not appreciate as a result of the improvement and developers would not capture the rents.

5. By affecting traffic levels, it would also affect total benefits and in some cases cost and design.

2.3 The Role of Property Taxes

Tolls are not the only instrument that governments have in order to capture a share of the benefits of urban highway improvements. Since benefits in excess of the toll are appropriated to a large extent through land ownership, the government could capture part or all of the benefits not appropriated via the toll with a well-designed property tax. There is a simple way for checking whether an existing property tax, if enforced, is capable of capturing a large share of the rents generated by a project (Londero, 1999). 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, assuming full compliance, the present value of the yearly tax collections from property i, T_{it}, over an infinite horizon would be

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

where d is the discount rate. In this simple example, 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 $t = d / \alpha$. For example, if the official valuation is 80 percent of the market value and the discount rate is 3 percent, the tax rate that captures in present value terms the entire increase in market value would be 3.75 percent.

The amount of benefits yearly redistributed to the government by the property tax would depend on fiscal valuations, tax rates, and evasion rates. Expression (1) assumes a fiscal valuation that is a constant share of market value and full compliance. However, fiscal valuation and enforcement are government actions, and could thus be discretionary. It becomes a matter of governance whether certain areas may the subject of special fiscal valuations or whether compliance is enforced and how. Therefore, estimates of α and the introduction of compliance coefficients may depend on location. These characteristics (fiscal valuations and enforcement), however, may be pointed out by the project analyst as determinants of the final distributional outcome and may be taken as research subjects.

2.4 Alternative Transportation Modes

Consider now the case in which the highway competes with a metro rail. I the highway is not improved, raising car and bus travel costs would make metro riding more appealing, increasing the demand for properties near the metro and, for given fares, their values. This is one of the reasons why land close to metro stations becomes very valuable leading to a higher density development in which apartment and commercial buildings replace single family homes over time and density increases. For given metro fares, congestion would eventually increase travel costs by metro as well and slow down growth around the stations. Metro commuters would gain the difference between the increased property values and the increased travel costs resulting from the additional riders. If metro riding is the counterfactual to increasing traffic by improving the highway,[6] the project would at least in part also transfer commuters from the metro to the highway, and the commuters' gains and those of the developers in the outskirts of the city would be in part losses to the landowners around metro stations.

There are important lessons here. First, here again metro fares, highway tolls and property taxes would allow governments to capture part of the private benefits. Second, the existence of alternative transportation modes reduces the incentives for downtown landowners to favor improving the highway, since car transportation is only one of the possible alternatives for carrying more people downtown. In other words, downtown landowners would be in favor of reducing the costs of commuters and only more specific reasons (e.g. proximity to one of the modes) could make some of them favor one alternative over the others. Third, different rates of subsidies between metro rails and highways imply significant distributional effects among landowners, particularly developers of a growing city, and carry the potential of discriminatory practices. Last, but not least, understanding the distributional effects of alternative government policies is important to understand local politics.

There is another type of consequences of transportation decisions and these consequences also carry important distributional effects. Financing the improvement and extension of toll-free urban access highways and roads leads to less dense cities, since travel costs from further away areas are kept low. On the other hand, investing in increasing the carrying capacity of existing roads and

6. Actually it would be only part of the counterfactual. See the section on net benefits below.

metrorails without extending the network leads to a higher density city. The former would tend to benefit primarily developers, thus having a much more concentrated distributional impact, but it would benefit landowners along the new or improved roads as well. The latter would tend to benefit existing landowners along the improved corridors and distributional effects could be more widespread among middle- and low-income groups.

In both cases, the value of early information is very high, since it may allow developers to buy land before land prices start to register the value of the improvements and small owners to postpone selling decisions. The decisions regarding secrecy and transparency of the available information, another policy variable, could critically affect the distributional effect. Reversing the logic, the ability to buy land first and then successfully lobby for the improvement tends to concentrate the distributional effects among the rich.

It is important to note that the number of instruments available to change the distributional effects of projects like the one presented are limited and lie primarily outside the areas of control (Sen, 1972) of those analyzing the project. Once the project has been defined as reducing the transportation cost of highway users, the main distributional effects are simply a result of structure (e.g. land property) and the policy context (e.g. tolls and taxes). It should also be noted that these instruments are very powerful, particularly as regards the distribution between the private and the public sector, calling attention to the discussion of the policy in which these projects take place. Affecting distributional outcomes has intrinsic limits.

The reader may like to apply the preceding line of reasoning to other transportation projects. For example, the improvement of an airport in a small tourism island where coastline property is concentrated in a few hands, or the construction of a bridge across a river dividing two municipalities.

3. OTHER SIMILAR TYPES OF PROJECTS

Only urban highways have been considered thus far, begging the question of whether and how other road projects differ as regards distributional effects. The short answer is that they are different. In the case of interurban highways, whose benefits are estimated in a similar manner, there are two major differences. First, most of the cost savings accrue to vehicles that charge a price for the

transportation service they provide. If markets are competitive, travel cost savings to transportation companies and individual truckers tend to be passed on to purchasers of transportation services through fares. Thus, these cost savings tend to result in lower prices of domestically sold final goods[7] and thus benefits to be distributed according to consumption expenditure patterns. Something similar may happen to travel cost savings accruing to buses, although fares could be regulated and thus regulations would determine the final distributional outcome. Second, the great majority of the travel cost savings, including cars, do not accrue to people living close to the highway because these locations account for a very small share of total traffic; thus travel cost savings do not become an almost exclusive attribute of location. Depending on the existence and level of property taxes, some benefits may be appropriated as land rent, but the share of total benefits distributed according to the pattern of an urban highway is much smaller. Of course, the closer to a great metropolitan area a highway is, the more the distributional effects of improving it will resemble those of an urban highway.

The case of rural roads is also different. The reduction in travel cost savings facilitates access to labor, financial and good markets and this access operates in both directions. The effects resemble those of trade liberalization, since lower transportation costs change access to markets and relative prices with respect to the rest of the country. Residents along the rural road have better access to: i) employment in and labor from other areas; ii) purchasing financial assets and to financing; iii) input and output markets. More unidirectional are likely to be the effects of better access to technology, education, health and other services. Better access to labor, financial, input and output markets, as well as to technology, is expected to lead to increases in agricultural producers' surplus that would be primarily appropriated through land ownership. However, for other producers, the reduced transportation costs could imply greater competition and reductions of their producers' surplus. Better access to labor markets may increase wages of area residents if there is more economic activity in the area and there are better opportunities outside of it, or may reduce wages if access to technology and financial markets lead to more capital intensive farming and access to other labor markets provides cheaper labor from outside. Better access to education, health and other services

7. Benefits to sellers of traded goods may be retained as profits.

would primarily benefit residents along the rural road and would be appropriated according to the rules of access to such services.

There are many other examples of projects where benefits are estimated in ways that make the processes determining the final distributional effects more difficult to understand and assess. But, regardless of how benefits are generated, if they are an attribute of location it is likely that they will be captured through increases in land values. Slum relocation projects, for example, may be promoted as a way to "help the poor" improve their housing conditions, when in fact they could be large real estate operations by which the poor are relocated to less desirable locations with the incentive of a housing subsidy, while landowners of the original site and the surrounding areas capture a large share if not most of the benefits (Londero, 2003a). Other examples are relocating jails, slaughterhouses, garbage stations and in general activities perceived as generating negative externalities to the surrounding area.

Some environmental projects may carry similar distributional effects. In some instances, the government initially allowed private land ownership in environmentally fragile areas. Then, when nature affects these properties, public resources are used to restore some of their initial characteristics. For example, in the absence of a well-administered property tax, benefits of investments to prevent beach erosion or to compensate for the action of nature on the coast will be captured primarily by landowners. In these cases, and in the absence of compensating instruments, the amount of transfers from taxpayers to landowners may become large and highly concentrated (e.g. hotels, resorts). These issues are of paramount importance in places like small tropical islands deriving most economic activity from tourism.

Public education in some countries provides another interesting example. Consider a case in which student allocation is determined by domicile and the quality of education varies significantly among counties and schools, thus school quality becomes a characteristic influencing the demand for land (location). As a result, at least part of the benefits from free public education will be reflected in the price of land. In the absence of taxes capturing these rents, students may appropriate most the private benefits of such education, but their families would pay for them in the

form of higher property values or higher rental prices.[8] Consider now the case of freely provided public education when it is financed primarily at the local level, mostly from property taxes. In this case the government would appropriate a share of the benefits from improving education However, since education quality would respond positively to the amount of per capita resources and tax revenue would be determined by income levels, the institutional arrangement would lead to concentration of quality in the richer localities fed by school resources and the value of land, raising issues about equal opportunity.

Irrigation is another case where land ownership plays a crucial role. If markets are competitive, the provision of irrigation by the government at a price farmers are willing to pay would increase the rent of the landowners even when the water tariff may cover marginal cost. If the additional supply also leads to price reductions (and not just to the substitution of marginal producers that continue to determine market price), consumers would also benefit.[9] Only when the irrigation project affects the marginal producers leading to more significant output price reductions would a significant part of the existing rents be transferred to consumers through prices (Londero, 1987, Ch. 7). These marginal producers are likely to include a higher share of poor farmers, and these farmers would only be benefitted if there is a difference between the water tariff and their willingness to pay. Efficiency would require that the tariff covers marginal cost. Therefore, from the purely irrigation perspective, in order to both comply with efficiency criteria and benefit the poor the water tariff would have to equal marginal cost and be below the poor farmer's willingness to pay. However, irrigation projects often include the transportation access and other requirements to attaining the agricultural benefits, modifying the simple rule. For example, the effects of improving transportation access are similar to the ones described under rural roads, thus not only making the agricultural benefits of the irrigation possible, but also providing other benefits to the irrigated and non irrigated areas.

There are also costs associated to location. While improving an urban highway may increase

8. Hayes and Taylor (1996), Bradbury, Mayer and Case (1997), Downes and Zabel (1997), Black (1999) and Bogart and Cromwell (2000) provide evidence on the capitalization of education benefits.

9. These distributional effects may be important. See Wildasin (1988) and Londero (1987).

the value of most surrounding properties, those that are adjacent to the highway may see the noise and air pollution levels increased, and these are also characteristics affecting the demand for land. Therefore, the benefits to landowners from the reduction in travel costs would be offset by a reduction in the demand for land resulting from a reduction in the quality of location. Since the compensating variations of the noise and air pollution levels would be in general smaller for cheaper properties, both efficiency and financial reasons may guide urban planners towards choosing poor areas for a new road, thus benefitting the other residents that are not or are less affected by noise levels. Similarly, locating a trash disposal facility or other projects generating negative external effects where the poor live would reduce the efficiency cost of the external effects. To compound the adverse effects on the poor, this type of facility would probably yield no benefits to residents in the affected area. If there are external costs attributable to the project, the tariff should compensate for these costs so that willingness to pay for trash disposal would cover efficiency costs (price equals marginal cost) including those external effects, although under efficiency criteria the actual compensation is not required.

4. BENEFITS AND NET BENEFITS [10]

Thus far, the analysis has focused on the costs and benefits generated by projects without paying attention to net benefits. These would be the difference between the stream of costs and benefits generated by the project, and the corresponding stream that would have been generated in the absence of the project (counterfactual). If in the situation without the project the government could use the same financial resources to reduce taxes or finance alternative investments, these alternative courses of action would determine the forgone costs and benefits. Say that with the project the government commits a single payment of $100 in year zero in order to obtain a perpetual benefit stream of $12 starting in year 1, and with the alternative course of action it spends the same $100 with a perpetual benefit stream of $10; in this case the net benefits of the project would be a perpetual stream of $2. The distribution of the net benefits would be a stream made up by the difference between the distributions of the two $100 amounts and the differences between the

10. This section draws on Londero (1987, 2003a).

distribution of the each $12 amount and the distribution of the corresponding $10 amount (see Londero, 1987).[11]

Net benefit estimates are highly sensitive to the distributive effects of the alternative course of action (Londero, 2003a), which is normally uncertain. If in order to improve the highway the government has to commit a stream of budgetary resources, and the normal control variable (Sen, 1972) is the financing of an alternative expenditure with the same resources, that alternative expenditure and its distributional effect would have to be known in order to determine the distribution of the net benefits. Although difficult and subject to error, it would not be impossible to approximate such distributional impact. The limited available experience, however, is troubling: it suggests that projects are incorporated to the budget taking into account the relative power of the respective constituencies in negotiating with the government at the project level (think of the urban highway), and the poor frequently lack that political power. As a result, the share of benefits to the poor from marginally displaced projects may be relatively high. A corollary to the above is that increasing the net distributional effect of public investment may require increasing the political power of the poor.

Difficulties to establish the counterfactual should not prevent economists from attempting to provide tentative figures regarding net benefits. 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 least a positive net benefit to the poor when compared with tax incidence (the poor get in benefits more than they would receive in returned taxes). It should be noted that such effect may be obtained with the combination of a low share 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 share of the poor in average tax incidence. This seems to have been implicitly in the mind of the so-called 'Washington consensus',[12] since the

11. For a more detailed discussion of net benefits and distributional effects, see Londero (1987).

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

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 are rarely 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 minimum amount of net benefits that should be sacrificed in order to obtain one additional unit of benefit for the poor. The second criterion does not state how much higher the share of the poor 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 conceptually better, it is less clear how it could be implemented.

Regardless of the counterfactual used to assess net benefits, the responsibility for estimating the distributional effect of the alternative course of action will not be 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.

While trying to assess the distribution of net benefits may seem esoteric, it is very important for both theoretical and practical purposes. In the case of the highway improvement, a judgement on its distributional effects should be made not based only on its own effects, but also on those of the likely alternative. Moreover, since alternatives depend on control variables, there would be different net distributional effects under different control variables. For example, if the allocation of all items in the budget is within the control of the decision makers, the alternative may be chosen from a wide range of options and thus distributional effects. On the other hand, if the options are limited to other road projects the available range of alternative distributional effects may be quite different. An

obvious but important conclusion is that net distributional effects are conditional on the control variables. Therefore, it has to be expected that the arguments of public sector officials discussing alternatives within a given set of public expenditure policies would be very different from similar arguments by economists proposing a different set of policies.

The complications inherent to net distributional effects are significant, but decisions within the narrow limits of a given project are simpler, since major changes of these effects are limited by the very nature of the project. In the case of improving the urban highway, it is very little what urban transport authorities can do to improve its net effects other than trying to increase the share appropriated by the government by raising tolls and charging by distance (and even those may be outside their control). Toll levels and structure are important redistribution instruments, but their impact on net benefits is often limited by the ear-marking of toll revenue to roads, which limits the range of possible alternatives.

The introduction of tolls and the issues pertaining to property valuations and tax rates may lay outside the areas of control of the transport authority. Introducing tolls and changing property taxes are often under the control of the top level urban political authority, or sometimes even at a higher level. Therefore, any significant change of the *status quo* would have large political ramifications and would be rarely take place as a result of a single improvement project. There is a wide range of possibilities in both policy areas for the parties involved in the discussion of broader policy options. In fact, the problem may be turned around and it can be said that the distributional effects of these projects are in part manifestations of prevailing economic policies and that significant improvements in the welfare of the poor may be achieved by looking at improving these policies in accordance with poverty reduction objectives.

One important such area is to reduce subsidies to the non poor in order to be able to finance services and subsidies to the poor. For example, in the case of goods of services sold by the government, improving the welfare of the poor will require price-funding of the services to the non-poor so as to free the resources required to provide services to the poor. This identification of potential sources of transfers from non poverty targeted to poverty targeted activities should pay special attention to the identification of subsidies to the non-poor. The government would then be able to reduce or eliminate these subsidies and use the ensuing funding to finance programs that do

benefit the poor.

For example, there is a new type of programs aimed at compensating for negative externalities, in which money transfers are granted against compliance with specified conditions (school attendance, vaccination, etc.) aimed at avoiding the perpetuation of poverty.[13] If a sound argument can be made that these programs provide benefits that exceed the cost of providing the subsidy,[14] and that the subsidy is provided in a non-discriminatory manner, an equally sound argument can be made for the dismantling of other less efficient subsidies in order to finance these better ones. Otherwise budgets could become overloaded with demands that exceed the financing capacity and increase inefficiency in resource allocation. This is an important applied research subject worthy of a serious interdisciplinary effort.

These policy issues are important for multilateral development banks given their roles of policy advisors and their ability to impose conditionality at a purely policy level (policy based loans) and as a precondition to the financing of investments.[15] Any difficulty in raising these type of policy issues at the project level benefits the non-poor (e.g. landowners and developers) who conduct their discussions in terms of the existing policy framework, one that has often been designed under their political influence.

5. DIFFERENT PROJECTS FOR DIFFERENT FOLKS

The advantages of following true marginal-cost pricing become clear when the product or service can be provided at different levels of quality, but it is provided only at a high level (high cost) because a group of customers demand certain characteristics. For example, such is the case of reliability in electricity supply, where the poor may be willing to pay for the marginal cost of providing the service with a lower reliability level. Similar considerations would apply to providing

13. For a list and general description of these programs in developing America see the newsletter *Ideas for Development in the Americas*, Vol. 1, Second Quarter 2003, Inter-American Development Bank (http://www.iadb.org/RES/).

14. For evaluations of PROGRESA, perhaps the most studied of these programs, see Coady (2000) and Coady and Lee Harris (2000).

15. In a different economic environment, this option is exercised by commercial banks with respect to private profitability.

water with a wider margin of variation in water pressure. Here again, providing universal access at a lower reliability level charging a marginal-cost tariff may be possible within efficiency criteria avoiding a below cost tariff that reduces government expenditure in alternative programs and creates the conditions for inadequate access due to financing constraints.

In more general terms, people do not demand simply goods defined with a name, but bundles of characteristics (Lancaster, 1966), and these characteristics determine the costs of providing the goods satisfying the bundle. Efficiency criteria suggests that every effort should be made to fit the characteristics of the good supplied to those that are more valuable to consumers as determined by their willingness to pay. While practical reasons may limit the number of available options, and thus the ability to improve welfare by adapting the specific good to the demand for characteristics, the possibility should not be discarded without demonstrating that it is not viable.[16]

A good knowledge of the demand for characteristics should be an important input to project identification and conceptualization, since later on the 'freight-train effect' may prevent redesigning the project at more advanced stages. Therefore, improving the welfare of the poor requires to know what do they demand. But, how much do we know about the characteristics demanded by the poor? How do we get to know them? If known at the research level, how well are they known to those identifying and preparing projects? Shouldn't that knowledge precede the definition of 'merit wants' (UNIDO, 1972)?

For example, the poor demand a place to live close to employment opportunities. This is not demand for housing, but demand for location where to erect any form of shelter. The unwillingness to recognize this need has led to settlements in places where nobody else would dare to live, putting people at serious risks from natural disasters. Improving the conditions of the poor requires to provide them at least with the possibility of erecting their own house in a safer place. It is a humanitarian issue, as well as an economic one. The costs incurred later on when disasters happen more than outweigh those of preventive measures.

A related issue is to avoid imposing costs on the poor once they live in a certain place, and this is related to a better design of certain infrastructure projects. One example is that of highways

16. For example, in the case of electricity, interruptible supply and time-of-day pricing.

in low urban areas requiring embankments. These embankments may interrupt the normal flow of water and in rainy periods lead to flooding, generating huge costs to the poor. It may be argued that it would be more efficient to prevent settlements in low areas, and this prevention would probably lead to the need of a poverty targeted settlements program.

The problem is one of incentives. First, preventing settlement by enforcement does not gain votes (it may reduce them!) and the financing for the housing programs may not be available. Then, once settlements have taken place the burden relies on project design. But there is a problem of incentives with relying on good design, since its benefits cannot be appreciated by the non expert. In other words, it is difficult to appreciate the benefits of avoiding what does not happen and therefore there is no political gain, and some additional costs, associated to good design. While there is a political cost associated to the disaster when it happens, the probability of it happening within the term limits of the politician responsible for the design is close to zero and attribution can always be contested in the arena of public relations, thus reducing the incentives for proper design. But one thing is clear: once people has been allowed to settle in these areas, road design and appraisal must take the costs of flooding into account. Moreover, even when people are not there yet, project design should consider whether the area is likely of attracting settlements – partly due to the road itself – take it into account when identifying and appraising alternatives and point out the dangers of the alternative courses of action.[17] Given the problems with incentives mentioned above, these dangers should be spelled out in a manner that prevents "plausible deniability".

6. THE IMPORTANCE OF APPLIED RESEARCH

The knowledge about the distribution of costs and benefits of public investment is very limited, particularly in developing countries. There are occasional attempts to estimate distributional effects ex-ante, but there seems to be very little in terms of designing good "controlled experiments" for ex-post estimates. This lack of information makes assessing the distribution of net benefits even more difficult. In fact, it seems that distribution does not matter to policy makers, while practitioners have

17. Fortunately, there are better incentives for international financial institutions, since they will continue to be there after the government has left. This is a less recognized benefit of the involvement of these institutions in the financing of public investments.

evidence to the contrary when it comes to project identification, design and selection. The answer may be that the less it is known about the distributional effects of alternative investments, the more politicians are able to use public investment for political gain.[18]

Take the case of projects in which benefits are appropriated via land ownership. Since there are very few studies looking at the distribution of ex-post benefits and how much of the benefits is captured through land prices, there is very limited information to assess the true beneficiaries of these public investments. A corollary is that there is little information that can be used to support developing the constituency necessary to introduce or improve property taxes.

The situation is even worse when it refers specifically to benefitting the poor. There are analyses of the distribution of outputs, in the sense of the income levels of service recipients (e.g. income levels of families of students, trainees, vaccinated children, and so on), but not of the benefits resulting from those outputs (Londero, 2003a). While some of these programs are predicated on the negative external effects derived from low or no consumption of these goods and services by the poor, there is limited effort in estimating these welfare effects. As a result, policies aimed at improving the conditions of the poor in many cases resemble shooting in the dark. The profession may have educated guesses, but does not know whether switching from subsidizing good A to subsidizing good B would improve the welfare of the poor, and therefore finds it very difficult to attempt improving the welfare effect per unit of subsidy. A classic case is that of conditional cash transfers, where sorting out supply from demand effects is of the essence for designing the best approach.

In recent years, the availability of this type of information has worsened. There are less resources dedicated to ex-ante cost-benefit analysis and more emphasis is placed in output and outcome indicators, which are often not based on demonstrations that they yield benefits that outweigh the costs or, when benefits cannot be estimated, that it is a least-cost solution. At the ex-post level this trend translates into a verification of outputs (and sometimes outcomes), and victory may be declared without knowing whether benefits are greater than costs.

18. One exception is that of urban economics, where there are several statistical attempts at estimating broad distributional effects of public investment, but without reaching the level of an ex-post distribution of costs and benefits.

There is also very limited systematized information about what is it that the poor want. Increasing the welfare of the poor seems to be guided to a large extent by the welfare function of the non-poor. There could be an argument to ignore the preferences of the direct beneficiaries in cases like education or health services for the children, where it could be argued that they are not qualified to make long-run intertemporal calculations, thus providing a justification for violating a crucial assumption of traditional applied welfare economics (Londero, 2003b), and do not have adequate representation.[19] It is more difficult to justify when providing subsidies through prices to the consumption of specific goods like water or electricity. Moreover, the set of characteristics bundled in the goods offered to the poor are those determined by overall demand, where the non-poor drive the results (e.g., electricity reliability, water pressure).

7. CONCLUSIONS

The pricing of public services and tax policy issues are crucial in determining the distributional effects of many infrastructure projects. Although these policies are a given to the project analyst, he or she may use the project analysis to call attention to their most important implications. For example, the analyst may call attention to the consequences of the absence, level and structure of prices and show how it is possible to change it in order to improve efficiency and distributional effects. Just an estimate of the forgone public revenue resulting from not pricing at long-run marginal cost (amount of the subsidy) is a very important information for policy analysis. The analyst may also call attention to the absence or the characteristics of the property tax system and its implications for the distributive effects.

Whenever a subsidy is implicitly proposed, it should be made explicit. Knowing who is being subsidized and by how much facilitates the discussion of its desirability. That leads to avoiding nontargeted subsidies and to the discussion of the best way of accomplishing the objectives pursued with the proposed ones. Whenever a subsidy is proposed by invoking the existence of external

19. As Marglin (1967, p. 22) put it "... on Mondays, Wednesdays, and Fridays I am thoroughly convinced of the propriety of the merit-want objective, but on Tuesdays, Thursdays, and Saturdays I am equally sure that the essence of human freedom is individual choice, although the choice of ignorance for one's children or an inadequate diet seems to stretch unreasonably the range of decisions to which individual choice should apply."

effects, the existence such effects should be proved and the levels of consumption to which they are associated should be determined. Applied research should be requested as an input to policy decisions in order to tailor subsidies to objectives.

It is always useful to think in terms of net benefits. At the project level, even when the distributional effects of the alternative course of action are unknown, the proposed project may be compared to tax incidence or the average financed project. It is also important to think in net terms when discussing policy, and that discussion may also take place at the project level. The project analyst may legitimately question a subsidy by calling attention to the net distributional effect arising from eliminating it and using the proceeds to finance other existing programs.

There is insufficient applied research, evaluation type research in particular, of the benefits per unit of cost and of the distribution of these benefits for the large majority of the public sector expenditures. This research is important for it provides crucial information for improving not only efficiency outcomes, but distributional as well. More detailed ex-post cost-benefit analyses are needed, and more that include estimates of distributional effects. Multilateral development banks could play an important role in these efforts not only as generators of information for their own use and that of its borrowing member countries, but also as clearing centers and providers of information on economic performance (Rodrik, 1995).

In particular, there is insufficient applied research into the benefits per unit of cost of alternative poverty reduction instruments. Most of the existing studies look at the incidence of outputs, but not at benefits to the poor per unit of expense. Also lacking are studies on the specific characteristics demanded by the poor. These type of studies are crucial to improve project design.

There is room for the use conditionality for helping the poor, and such use should encompass distributional issues in general. In so doing, it will be possible to call attention to the potential net distributional effects achievable by policy change; for example, introducing tolls, reducing other nontargeted subsidies or improving the property tax, and using the proceeds to finance the expansion of a poverty targeted conditional cash transfer program.

Ex-ante and ex-post cost-benefit estimations of distributional effects should not be ends in themselves. They should provide critical information for understanding the results of what we are doing and thus help inform better project design, project choice and policy design.

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