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Leaky Bucket

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Consider a situation when we need to transport water from one place to another place in a leaky bucket. Some of the water would always leak out. If all water leaked out, it is obvious that we would stop our efforts to carry water. Our decision to carry the water or not will depend on how leaky the bucket is and on how big is our need for water at the destination. For instance, if bringing a little water to the other end can save a life we will be perhaps willing to accept that, say, 99 % of the water leaks out. This is an extreme situation. Societies, however, tacitly judge how much leakage they are prepared to tolerate while making a transfer to the needy.

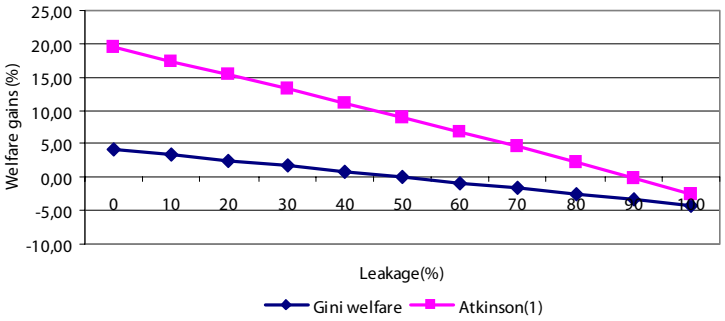
Imagine a hypothetical society consisting of two people: one poor and one rich with incomes $50 and $500. To have a grasp of welfare in this society we might think of a function where total welfare increases whenever the incomes of these two persons grow and whenever the increase in income of one individual does not decrease the income of the other. This is the famous *Pareto* optimality criterion. We may introduce a second property to this function to state that any transfer of income from the rich to the poor also increases social welfare. This is called the Pigou-Dalton principle of transfer. The basic idea behind this principle is that the gain of $1 by the poor is more valuable than the loss of $1 to the rich. Taken together, these criteria imply that any redistribution of income from rich to poor will increase social welfare provided that total income available to society does not decrease.

In accordance with the above principle, any redistributive policy that reduces inequality without reducing the average income of the society in question should be considered as good. If the redistribution of income from rich to poor is welfare enhancing, why do governments not always redistribute incomes from the rich to the poor, and reduce both inequality and poverty? There are, of course, many reasons of political economy why this is so. But there is also one catch in the welfare function that it is useful to think about explicitly: the money must be carried from the rich to the poor in a leaky bucket (Okun, 1975). There is no costless transfer of money from the rich to the poor: some of the money will always disappear in transit so the poor will not receive all the money that is taken from the rich. The leakage basically represents inefficiency. The issue is how much inefficiency a society is or should be prepared to tolerate? The answer depends on how much importance the society gives to reducing inequality.

Policies dealing with inequality and recommending income transfers are usually framed within one of the two most widely used social welfare functions or measures of income inequality. The Gini index is the one most widely used measure of inequality. The social welfare function implied by the Gini index is defined as mean income multiplied by one minus the Gini index. The other most widely used is Atkinson's social welfare function, whose construction allows for different degrees of inequality aversion expressed by the parameter ε. The larger ε is, the greater is inequality aversion and, thus, the greater will be tolerance of leakages.

To illustrate how these two types of social welfare functions interplay with leakages and inequality, let us chose ε as equal to 1. Suppose we transfer $25 (5% of the income of the rich) from the rich to the poor. If the society can be better described by a Gini social welfare function, then transfers will stop when the leakage is greater than 50%. At this point the per cent change in social welfare becomes negative and total welfare is reduced. If the society can better be modeled by Atkinson's welfare function, then waste can go up to 90% before the transfer is regarded as undesirable. Thus, a society behaving along the lines of an Atkinson welfare function with moderate aversion to inequality ($\varepsilon = 1$) is much more concerned with inequality than a society behaving according to the Gini welfare function.

Impact of leak age on welfare



Leaks, in the more general sense of the term adopted here, can occur due to several factors, including administrative cost corruption, reduced or misplaced work effort, distorted saving and investment decisions, possible changes in socioeconomic attitudes, and targeting errors. All of these should be, and usually are, carefully weighed when analysing the efficiency of redistributive policies. But the lesson here is that the choice of inequality indicator itself, and thereby a social welfare function, is not an inconsequential matter. Careful attention must be given, which is not often the case, to the choice of indicators and the analytical framework. Society's concerns with inequality and poverty should be properly addressed and reflected in policy evaluations.

Reference:

Okun, Arthur, M (1975), *Equality and Efficiency: The Big Tradeoff*, the Brookings Institution, and Washington DC.

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