1 How can money measures of utility changes (the cv and ev) be used to evaluate policies?

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Assume a state of the world s from the perspective of individual i can be described by the vectors $\mathbf{S}_i^s \equiv \{y_i^s, \mathbf{P}^s, \mathbf{C}^s\}$ where y_i^0 is individual i's income in the initial state, $\mathbf{P}^0$ is a the price vector for market goods in the initial state and $\mathbf{C}^0$ is a vector of the levels of the nonmarket commodities in the initial state.

How can we tell if a policy increases social welfare?

1.0.1 This question can be easily answered if one know the swf function

$$sw = sw(\mathbf{y}^s, \mathbf{P}^s, \mathbf{C}^s)$$

where $\mathbf{y}^s$ is the vector of incomes, for each of n individuals, in state s ($\mathbf{y}^s = (y_1^s, y_2^s, ...y_n^s)$). A social-welfare function indentifies society's ranking of states of states-of-the world. The vector $\{\mathbf{y}^s, \mathbf{P}^s, \mathbf{C}^s\}$ is a world in terms of its levels of all the relevant exogenours variables.

If one happens to know the social welfare function, one can always determine whether $sw(\mathbf{y}^1, \mathbf{P}^1, \mathbf{C}^1) \lessgtr sw(\mathbf{y}^0, \mathbf{P}^0, \mathbf{C}^0)$.

What is a social welfare function and how might a society figure out what their social welfare function is?

Put simply, a social welfare function ranks all possible states of the world in terms of the welfare of society, the higher the rank of a state the more it is preferred by society.

As to how a society might agree on a swf, **who knows?**

If a society happens to have a swf (unlikely) it is likely the preferences of a consistent dictator.

A constitution can be viewed as a weak form of a swf in the sense that it provides a mechanism for ranking states of the world.

For example our Federal Constitution provides certain mechanisms (marjority voting tempered by veto power, the courts, and the bill of rights) for ranking states of the world

Welfare economists woudl say that the social-welfare function should reflect the preferences of the members of society in that Pareto improvements should imply an increase in social welfare.[1] The social welfare function must reflect (incorporate) how society will trade off the welfare of its different members.

The bottom line is that we as members of society do not all agree on a specific social welfare function. And it is hard to imagine the citizens of the U.S. choosing a SWF

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[1] One could imagine social-welfare functions where Pareto Improvemetns decrease social social welfare. For example, the social welfare function chosen by the Devil for the residents of Hell would probably require that Pareto Improvements decrease social welfare. Or a policy makes not one worse off but only makes the richest person in the world better off.

1.0.2 Can we use the cv or ev measures to answer the question of whether a policy increases social welfare?

Most of the time, NO.

Assume we know, for a policy (change from $\mathbf{S}_i^0$ to $\mathbf{S}_i^1$), cv_i and ev_i $\forall i$. That is we have accurately estimated everyone's compensating and equivalent variation for the policy change.

If $cv_i \geq 0$ $\forall i$ and strictly positive for some i, the policy is a Pareto improvement. (Also true if $ev_i \geq 0$ $\forall i$)

This does not imply that the policy is social welfare increasing for all social welfare functions, but it says that the policy is welfare increases for all swf that assume social welfare goes up if some members are made better off and none are made worse off.

What if some of the cv_i are positive and some are negative (the common case). In which case, we might consider

$$\sum_{i=1}^{N} cv_i$$

and

$$\sum_{i=1}^{N} ev_i$$

Which sum should we use if want to see if the policy passes the B-C test (to see if the proposal is efficiency increasing) ?

The first.[2]

Why? We want to see if in the **new** state the winners could compensate the losers. In explanation, if an individual finds the policy an improvement, her $cv > 0$ and it is her wtp for the improvment. If the individual finds the policy a deterioriation, $cv < 0$ and is, in absolute terms, the individual's wta the deterioration. If

$$\sum_{i=1}^{N} cv_i > 0$$

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[2] $\sum_{i=1}^{N} ev_i > 0$ says that the amount the potential winners would have to be compensated to forego the change (their wta to accept the status quo) is greater than the amount the losers would pay to maintain the status quo (their wtp to not be made worse off). This might be a bit difficult to get your mind around. The important point is that $\sum_{i=1}^{N} ev_i > 0$ does not imply the change is a P.P.I. Said another way, $\sum_{i=1}^{N} ev_i > 0 \nRightarrow \sum_{i=1}^{N} cv_i > 0$. Remember that $cv_i \leq ev_i$

the policy would be a P.P.I. $\sum_{i=1}^{N} cv_i > 0$ does not imply the policy would increase social welfare. It does imply that the current allocation (before the policy change) is not efficient.

What if
$$\sum_{i=1}^{N} cv_i < 0$$

We can conclude the policy would not be a P.P.I.–it fails the B-C test. $\sum_{i=1}^{N} cv_i < 0$ does not imply that the policy would decrease social welfare; that is, it still might be welfare increasing.

Many economists spend much time estimating the $\sum_{i=1}^{N} cv_i$ for different policies.

As economists working for policy makers, how should we present and explain our cv_i estimates to the policy makers? Tell them who wins, who loses and why.

Consider, for example, Boulder's Open-Space Program. Was the program a P.I.: NO. Was it a P.P.I.? Who won and who lost and how much in $? (one would have to do a big study)