



Quantifying the Effects of Policies on Well-Being: The Budget Lab’s “Economic Value” Measure

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Introduction

When evaluating the effects of policy changes on individuals and/or families, a critical question is how to quantify what those policy changes mean for well-being. This is especially important when doing distributional analysis—asking how a given policy’s effects differ across economic and demographic characteristics like income, wealth, age, race, family size, or geography.

In this blog post, we introduce The Budget Lab’s preferred way of measuring policy-induced changes in a given individual or family’s well-being, which we call the **economic value** of the policy for that individual or family.

Economists often quantify how a proposed policy would change someone’s well-being by asking, “How much additional income would they need in order to be exactly as well-off today as they would be if the policy were enacted?” Economists refer to this quantity as the equivalent variation or *willingness to pay* for the policy.

For many policies, it is straightforward to answer this question: for example, if we were to impose a \$1 lump-sum tax on all individuals, every individual would be made worse off by exactly \$1.

But what if the policy induces individuals to change their behavior—their labor supply decisions, for example, or their purchasing decisions? In that case, the answer is less straightforward. Suppose, for example, that the government increases a tax on a given good, and in response to the change in effective (after-tax) price, an individual purchases less of the good. Following the increase in the tax, then, the individual’s out-of-pocket spending on the good in question (after-tax price times quantity) can actually go *down* as they substitute to other goods and services with some of the money they are no longer spending on the taxed good. But the individual is clearly made worse off by the tax increase: absent the change, they would have preferred to purchase more of the original good, but that option may no longer be affordable to them. So despite the increase in their disposable income—after reducing consumption of the taxed good and before substituting to others—the individual would likely have *negative* willingness to pay for the policy. In other words, they would be willing to pay some amount of money to avoid the policy.

So to quantify individuals' (or families') willingness to pay for a policy, we need to account both for changes in incomes and prices *and* for changes in behavior. The "economic value" measure we introduce here does so in a way that is informed by economic theory. (For details, see the Technical Note below.)

Defining the "Economic Value"

To define our measure of "economic value," it is useful to distinguish between *prices* and *choices*. "Prices" are unaffected by a single individual's decisions. They include not only effective (after-tax or after-subsidy) prices for goods and services, but also after-tax wages, after-tax nonlabor income, and transfers that do not depend on earned income. "Choices" here include (a) quantities of goods and services purchased and (b) hours worked.¹

In words, the economic value of a policy change is given by the average of two figures: one that keeps choices fixed at their baseline (pre-policy) values and one that keeps choices fixed at their scenario (post-policy) values. In both cases, prices are allowed to vary. We ask the following questions:

1. Holding choices at their baseline values but allowing prices to change, what is the policy-induced change in:

1. total after tax-and-transfer income, minus
2. out-of-pocket spending on goods and services?

2. Holding choices at their scenario values but allowing prices to change, what is the policy-induced change in:

1. total after tax-and-transfer income, minus
2. out-of-pocket spending on goods and services?

The economic value is the average of (1) and (2); averaging the two together thus accounts both for changes in prices and changes in quantities. As we show in the examples below, this definition reduces to simpler (and in some cases familiar) concepts when used in practice.

Example 1: A Policy-Induced Price Change

To return to the example in the Introduction, suppose the government imposes a sales tax on the purchase of cookies, increasing their after-tax price from \$1 to \$1.50 per cookie. Suppose that, in the face of this increase, an individual reduces their cookie consumption from ten cookies to five cookies (and makes no other changes to their behavior).

In this case, because after-tax income has not changed, the first of the two quantities above is the negative of the number of cookies purchased at baseline (10) multiplied by the change in after-tax price (\$0.50), which equals -\$5. The second quantity is the negative of the number of cookies purchased in the policy scenario (5), again multiplied by the change in after-tax price (\$0.50), which equals -\$2.50. Averaging these (-\$5 and -\$2.50) yields an economic value of -\$3.75: the individual would be indifferent at baseline between (i) having the change in tax implemented and (ii) losing \$3.75 in income but not having the policy implemented.

Example 2: A Change in Taxes with No Behavioral Changes

Conventional distributional analyses of changes in individual income taxes hold behavior, including both real economic choices (like labor supply and consumption decisions) and nonsubstantive tax-avoidance behavior (like

retiming of capital gains realizations), fixed.² They also assume no changes in equilibrium after-tax prices for goods and services, so that total nominal national income is held fixed.

Since, in this case, scenario choices are the same as baseline choices, and prices for goods and services do not change, quantities (1) and (2) above are both equal to the change in after-tax income holding choices at their baseline levels. In other words, the economic value of an individual income tax policy change is equal to the mechanical change in after-tax-and-transfer income—the measure already used by The Budget Lab in its distributional analysis of these policies. Recent examples include our distributional analyses of “[tariff dividends](#),” [capital gains indexation](#), and other [tax proposals](#).

Example 3: A Change in Taxes, Transfers, and Prices with Behavioral Changes

In its recent report on [federal subsidies for early childhood education and care \(ECEC\)](#), The Budget Lab modeled how specific examples of these policies would affect families’ care and work decisions. Here, the estimates included changes in both prices (such as after-subsidy prices for ECEC options) and choices (ECEC enrollment and parental labor supply).

In this case, The Budget Lab used the full definition above, and computed the economic value of each policy as the average of:

1. The change, under the policy, in the family’s after-tax income net of out-of-pocket ECEC spending if they had kept their baseline choice of care type(s) and work decisions unchanged; and
2. The change, under the policy, in the family’s after-tax income net of out-of-pocket ECEC spending if they had chosen the same care type(s) and work decisions in the baseline as they ultimately do under the policy.

Technical Note

Formally, the **economic value** of a policy change for individual (or family) *i* is given by:

$$\begin{aligned}
 EV_i \equiv & \frac{1}{2} \left[\Delta I_i + \Delta y_i + l_i^0 \Delta w_i - \sum_k x_{ik}^0 \Delta p_k \right. \\
 & - [T^1 (y_i^1 + w_i^1 l_i^0) - T^0 (y_i^0 + w_i^0 l_i^0)] \\
 & \left. - \sum_k x_{ik}^0 \cdot [\tau_k^1 (y_i^1 + w_i^1 l_i^0) - \tau_k^0 (y_i^0 + w_i^0 l_i^0)] \right] \\
 & + \frac{1}{2} \left[\Delta I_i + \Delta y_i + l_i^1 \Delta w_i - \sum_k x_{ik}^1 \Delta p_k \right. \\
 & - [T^1 (y_i^1 + w_i^1 l_i^1) - T^0 (y_i^0 + w_i^0 l_i^1)] \\
 & \left. - \sum_k x_{ik}^1 \cdot [\tau_k^1 (y_i^1 + w_i^1 l_i^1) - \tau_k^0 (y_i^0 + w_i^0 l_i^1)] \right],
 \end{aligned}$$

where:

- I_i denotes nontaxable exogenous income (for example, lump-sum transfers);
- y_i denotes taxable nonlabor (exogenous) income;

- l_i denotes hours of labor supplied;
- w_i denotes the wage;
- $T(\cdot)$ is the individual income tax-and-transfer function;
- x_{ik} denotes the quantity purchased of good k ;
- p_k is the market price of good k ;
- $\tau_k(\cdot)$ is a (possibly income-dependent) per-unit tax or subsidy on good k ;
- superscript 0 denotes baseline (pre-policy) prices and quantities; and
- superscript 1 denotes scenario (post-policy) prices and quantities.

This object represents a second-order approximation to the individual equivalent variation for the policy change, ignoring income effects. A formal derivation can be found [here](#).

The “economic value” concept generalizes the result of [Hicks \(1942\)](#), who focuses solely on exogenous price changes, to changes in individual utility arising from policy-induced changes to prices, transfers, and taxes. It also extends the work of [Leiserson \(2020\)](#), whose first-order “fixed-quantities” welfare measure is equal to the terms in the first set of brackets above, to environments where policy changes may have discrete behavioral changes that are (at least partially) welfare-relevant. A similar approach to approximating willingness-to-pay by averaging price changes evaluated at observable quantities is used in both [Finkelstein, Hendren, and Luttmer \(2019\)](#) and [Hendren and Sprung-Keyser \(2020\)](#).

In our computation of the economic value of a policy, we neglect income effects for two reasons:

- First, including these effects requires estimates of income effects for the specific quantities (rather than simulated price and quantity changes arising out of a microsimulation model), which are often unavailable.
- Second, evidence suggests that such effects are quantitatively small relative to substitution effects (see, for example, [CBO \(2012\)](#)), such that neglecting them does not introduce meaningful error into our approximation of equivalent variation.

Footnotes

- 1 Since it is a static measure, our current definition of “economic value” ignores changes in behavior along the consumption vs. saving margin, and so treats capital income as exogenous. In future work, we plan to extend the measure to better capture behavioral changes relevant to changes in capital income taxation.
- 2 While [certain kinds of budget scores](#) do include behavioral feedback, the associated distribution tables conventionally exclude this behavior.