

Counterfactual

BY RENEE COURTOIS

The nation's unemployment rate continued to grow in 2009 despite a \$787 billion fiscal stimulus package passed that February. Does this mean the stimulus was a failure? Comparing unemployment today to when the stimulus was passed won't tell us. Had the stimulus not been implemented, employment would not likely have stayed exactly where it was in February 2009 — the economy would have either worsened or improved due to other factors. A more accurate assessment of the program would ask a hypothetical question: Where would employment be *today* if no stimulus had been passed?

That hypothetical what-if scenario is called a "counterfactual." Many academic disciplines use counterfactual scenarios to help understand the impact on the world of some event or policy. Counterfactual historians, for example, imagine what the world would look like had the alliance between Germany, Japan, and Italy prevailed in World War II, or if the United States hadn't purchased Alaska and its rich oil reserves from Russia in 1867.

In economics a counterfactual often refers to a numerical estimate of how some economic variable would have performed had some policy action been different. The more accurately analysts can estimate what the counterfactual scenario would have been, the better picture we'll have of the policy's effects.

There are generally two tools for estimating a counterfactual to a macroeconomic policy: statistical estimates and theoretical economic models. To generate a statistical estimate, an economist will create the forecast he would have made before the stimulus affected the economy. He'll use regression analysis to estimate how the economic variables in question have tended to behave in the past and therefore what levels they were likely to achieve today without a stimulus. Comparing the counterfactual estimate of where employment would have been to actual employment is one way to gauge the stimulus's effect on jobs.

Statistical analysis tends to rely more on history than economic theory. The method does require making a few important assumptions about how variables relate to each other. But one needn't construct a full model of how the economy operates, which requires taking a more explicit stand on potentially unresolved issues, such as how likely households are to spend after a tax cut.

The statistical approach is relatively straightforward but it does have significant drawbacks. Since the forecast cuts off data starting from when the policy in question was

implemented, this method will lump together all the factors that have affected employment since then and attribute their effects to the stimulus. This includes other policies designed to help the economy, such as efforts by the Federal Reserve and other agencies to provide liquidity to credit markets, or perhaps fluctuations in international conditions that also affect employment in the United States.

Relying too heavily on statistical estimates may assume too much of historical relationships. The economic variables in question might not behave during the recession the way history, and thus statistical models, would predict. Perhaps the recession and financial crisis have hampered employment to an unprecedented degree, or new policies implemented since the onset of the recession have changed

the usual relationships between variables. Indeed, the policy being studied could itself have changed people's behavior in such a way as to make statistical relationships diverge from their historical patterns.

That's where theoretical models may usefully supplement the analysis. A theoretical model of the economy is a detailed story of how economic variables relate to each other based on the theories the economist finds most convincing — theories designed to be consistent with statistical relationships. For example, if they think households are likely to have an

unusually weak reaction to tax cuts, they can tweak a theoretical model to include that effect.

Such models will not only tell economists what the counterfactual scenario would likely have been without a given policy, but may also shed more light on which underlying factors in the economy have reacted to produce that outcome. And because of this feature, the theoretical method for estimating a counterfactual might allow a richer analysis of the trade-offs involved with a policy. The downside of imposing many theoretical assumptions on a model is there can be as many estimates of the counterfactual as there are theories of how the economy operates. To avoid this pitfall, economists seek to discipline their use of theories to those that fit data across a variety of applications.

Of course, any model is likely to miss some real-world detail and that can skew the results. That's why using both statistical and theoretical tools when analyzing macroeconomic policy often provides the most complete picture of a policy's effects. Using many estimates simply comes with the territory when trying to estimate what the world would be like in an alternate scenario.

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