Estimating Wage Effects of Proposed Minimum Wage Increases

A summary of the Economic Policy Institute's methodology

NOTE: Full methodology will be included in the forthcoming report: Chapman, Jeff, *The Wage Effects of Minimum Wage Increases*, Washington, D.C.: Economic Policy Institute.

The model

The first step is to calculate the effect of a minimum wage increase on average wages at different points in the wage distribution. In order to do this, we compiled a dataset using data from the Current Population Survey that contains average wage growth at various points in the wage distribution for each state in each year from 1984-85 to 2004-05. The dataset also contains data on state unemployment rates as well as identifiers for the year and state, which allow us to control for factors that are unique either to a single state (such as industrial make-up) or to a particular year (such as inflation).[1]

The key variable of interest is the change in the minimum wage. Past research has shown that the size of the "bite" of a minimum wage increase is strongly related to its economic impact. Therefore, the measure of a minimum wage increase that we use is the percentage of the workforce in the year before the increase earning between that year's minimum wage and the following year's minimum wage. This allows for the effect of a $1 increase in the minimum wage of a low-wage state to have a different effect than a similar increase in a high-wage state.

We then estimate an equation that uses the minimum wage increase, the unemployment rate, and state and year effects to estimate wage growth. The model finds that the effect of the minimum wage declines as you move up the wage distribution, but proves to be significant up to about the 20th percentile. These wage effects cannot be accounted for by the directly mandated raises required by the law, showing that the so-called "spillover effect" exists and is significant. It also shows, however, that it is rather modest and does not extend throughout the wage distribution. The theory behind this finding is that employers feel pressure to raise the wages of workers already earning above the new minimum wage in order to keep existing wage differentials.

[1] The model does not control directly for worker demographic characteristics. We found that while variables such as age, gender, and education are strong determinates of where one is in the wage distribution, they do not play a significant role in the wage growth at a narrow range of a state's wage distribution once state effects are controlled for.

Projecting forward

To model the effects of a minimum wage proposal, the first step is to estimate what each worker's wages would be in the absence of a minimum wage increase. The model described above lends itself well to this. We use Economy.com unemployment rate projections and assume that the state effects remain roughly similar and that year effects are roughly similar to the past few years. We are able to do this for various points in each state's wage distribution. We also use Economy.com employment growth projections to grow the workforce.

Estimating direct effects

For all workers whose predicted wage in 2007 is between the current and proposed minimum wages, we assume they will receive a raise directly due to the minimum wage. The direct effect for these workers is therefore the difference between their predicted 2007 wage and the proposed 2007 minimum wage.

Estimating average spillover effects

The next step is to estimate the average spillover effect for workers above the proposed minimum wage. This is estimated using the model described above and depends on the size of the direct effect. This is estimated separately for each point in the wage distribution.

Workers who were earning just below the proposed minimum wage are also given a spillover effect in accordance with their place in the wage distribution.

Distributing the spillover effects

We make the assumption that within a given point in the wage distribution the spillover boost received by workers takes on a normal distribution ("bell curve") around the mean estimated above. This assumption, commonly made in statistics, means that, for example, if the mean boost for workers earning $7.00 is $0.50, then roughly 95% of workers will receive boosts between $0.25 and $0.75.[2]

Defining a meaningful spillover boost

It is likely that the wage boost received by many workers within the affected range will be very small and not particularly meaningful even if statistically significant. We have chosen to count

[2] This also requires us to estimate a standard deviation. We found that setting the standard deviation to be ¼ of the mean provides what we believe to be the best fit.

only workers we expect to receive at least a 20 cent wage boost as a meaningful benefit. This would mean about $400 per year for a fulltime worker.

Given the mean boost estimated in the model and the assumption that the wage boosts are distributed normally at any given point in the wage distribution, we are able to estimate the number of workers that will receive meaningful boosts.