On February 10, we covered the Review Questions for the First Exam. The answers to the one question that we did not get to are reproduced below:

Economics 480 — Analysis of Labor Markets

Answer to Review Question #5
Spring Semester 2003

5. The tax that is currently used to finance the administrative costs of the Unemployment Insurance system is called the Federal Unemployment Tax (or FUT). FUT is paid to the federal government by employers through a payroll tax similar to the Social Security payroll tax. Currently every employer pays 1 percent of each worker's annual earnings, up to $8,000, to the federal government. As a result, the most an employer would pay in a year for a particular worker would be $(8,000)(0.01) = $80.

Suppose that total employment in the U.S. is 110 million; total labor cost is $2,000 billion; and FUT payroll taxes are $2.0 billion.

a. What percentage of total labor cost is accounted for by the FUT?

\[
\frac{2}{2,000} = 0.001, \text{ which is } 0.1 \text{ percent.}
\]

b. Suppose that Congress is considering an increase in the FUT from 1 percent to 2 percent (the tax base of $8,000 per worker would remain unchanged). What is the percentage increase in the FUT tax rate that is Congress considering?

This is a 1 percent increase starting from a base of 1 percent, so the percentage change is \(1/1 = 1.0\), or 100 percent. (If you used the midpoints formula, you would get \(1/1.5 = 0.67\), or 67 percent.)

c. Suppose that the economy-wide long-run total elasticity if demand for labor is \(-1.0\); that the scale elasticity is \(-0.7\); and that the substitution elasticity is \(-0.3\). What will be the effect of the proposed increase in the FUT on employment (that is, what will be the decrease in employment)?

Use the basic elasticity of demand of labor formula: 

\[
E_{ld} = \%\text{LD} / \%\text{wage}.
\]

You want to figure out \%\text{LD}. You know that \(E_{ld} = -1\), so you know the left-hand side of the equation. You also know that the payroll tax increases by 100 percent and is applied to 0.1 percent of payroll, which implies that \%\text{wage} is 0.1 percent. Plugging these into the equation gives:

\[-1 = \%\text{LD} / 0.1, \text{ so } \%\text{LD} = -0.1.\]

This just says that the payroll tax increase will reduce labor demand by 0.1 percent. Total employment is 110 million, and 0.1 percent of 110
million is 0.11 million, or 110,000. So the payroll tax increase reduces employment by 110,000.

d. How much of the change that you predicted in part c is attributable to the scale effect?

70 percent (-0.7/-1.0), or 77,000

e. How much of the change that you predicted in part c is attributable to the substitution effect?

30 percent (-0.3/-1.0), or 33,000