

Micro 20.1 Midterm Exam

Directions: You will have one hour to complete this exam. Read each question carefully and think your way through each problem. Don't lose points due to carelessness. **Points will be deducted for irrelevant information and/or if your answer is incomprehensible.**

Note: The questions in this exam are based on the attached editorial – “Tax Energy Use, Not Employment” by Robert Walker (*Christian Science Monitor*, 14 March 2007).

Part I – 100 points – Answer the following questions.

- (5 points) **Explain** why higher tax rates on gasoline would reduce the quantity of gasoline supplied and demanded. Use supply and demand curves to illustrate your answer.
- (10 points) Suppose that the elasticity of demand for gasoline is smaller in absolute value than the elasticity of supply of gasoline. Who would bear more of the tax burden? Consumers or producers? Use supply and demand curves to illustrate your answer.
- (10 points) Use the cross-price elasticities below to answer the questions that follow.

$$\frac{\% \Delta Q_{hybrids}}{\% \Delta P_{gas}} = 0.25 \quad \text{and} \quad \frac{\% \Delta Q_{SUVs}}{\% \Delta P_{gas}} = -0.50$$

- Are hybrids and gasoline complements or substitutes? Using the **sign** of the cross-price elasticity, give an intuitive **explanation** for your answer.
 - Are sport-utility vehicles (SUVs) and gasoline complements or substitutes? Using the **sign** of the cross-price elasticity, give an intuitive **explanation** for your answer.
- (25 points) Given the elasticities in question 3. and assuming that higher gasoline taxes would not shift either the SUV supply curve or the hybrid supply curve,
 - explain** how higher gasoline taxes would affect the equilibrium price and quantity of SUVs.
 - explain** how higher gasoline taxes would affect the equilibrium price and quantity hybrids.

HINT: You are not required to use supply and demand curves to answer this question, but I strongly encourage you to do so. Drawing supply and demand curves will help you write a better answer.

- (5 points) Given your answer to question 4., how would higher gasoline taxes affect the **relative** price of SUVs?
- (15 points) Using your answer to question 5., **explain** why an automaker whose production possibilities frontier (PPF) exhibits constant opportunity cost would stop producing SUVs and completely specialize in the production of hybrids.
- (15 points) Using your answer to question 5., **explain** why an automaker whose production possibilities frontier (PPF) exhibits increasing opportunity cost would produce more hybrids and fewer SUVs, but would not completely specialize.

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8. (5 points) Explain why lower payroll tax rates (e.g. income tax rates, Social Security tax rates and Medicare tax rates) would increase the quantity of labor supplied and demanded. Use supply and demand curves to illustrate your answer.

The Federal Insurance Contributions Act (FICA) tax is a payroll tax that finances Social Security and Medicare. By law, employers and employees each contribute 7.65 percent of the employee's wages toward the programs. Note that the total tax rate is 15.3 percent of wages and the tax payments are equally divided between employers and employees.

9. (15 points) Suppose that the elasticity of labor demand is larger in absolute value than the elasticity of labor supply.
- Would an economist say that the burden of the FICA tax is shared equally? Why or why not?
 - Who bears more of the tax burden? Workers or employers? Use supply and demand curves to illustrate your answer.

Extra Credit – 20 points – To correctly answer the following questions you need to read and understand Lecture 5. We haven't covered that material yet. That's why these are extra credit questions.

Consider the case of Joe Bagadonuts. Joe lives in Loserville, Long Island with his wife Jane Cuppacoffee and their three children, Peter, Paul and Mary. Because they live on Long Island, Joe has to drive to his job at Scimonoce, Inc., where he works as an office manager.

Note that if the proposal in the attached editorial were passed, Joe would have to pay higher gasoline taxes, but would receive a higher after-tax wage rate.

10. (20 points) Suppose that (if the proposal were passed) the additional gas taxes that Joe would pay are exactly equal to the higher wages that Joe would receive. In principle therefore, Joe could consume the same amount of gas that he did before. Would Joe consume the same amount of gas that he did before? **Why or why not?**



from the March 14, 2007 edition - <http://www.csmonitor.com/2007/0314/p09s02-coop.html>

Tax energy use, not employment

Let's cut payroll taxes to encourage hiring, and raise gas taxes to discourage oil dependence.

By Robert Walker

ARLINGTON, VA.

"Are You Smarter than a 5th Grader?" is the newest and hottest FOX television game show, and it's making a lot of us feel positively dumb.

Most of the questions on the show, however, amount to little more than trivia. Unless you are an artist, who cares what color you get when you mix red and blue?

But let's try a couple of fifth-grade level questions that really matter. For starters, should people be encouraged to work? Whew, that's an easy one. Of course.

OK, how about this one? Should the US reduce its dependence on oil? Another easy one. Everyone this side of fifth grade knows that the US is consuming too much oil.

Great. Let's try a question that's only slightly more difficult to answer. Does the federal government get more money from gasoline taxes than it does from payroll taxes? The answer is no. Not even close. The federal gasoline tax brings in about \$20 billion a year in revenues. Federal payroll taxes alone bring in more than \$800 billion a year.

And now for a trickier question: If people should be encouraged to work and gasoline consumption should be discouraged, why do we tax work so heavily and gasoline consumption so lightly? By now, you may be scratching your head and saying, "Yeah, why is that?"

There is no simple answer to this question. Some might say that many Americans need their cars and can't afford to pay more for gasoline. This is a valid point, but people need to work, too, and that doesn't stop Congress from taxing paychecks heftily.

Encourage 'goods,' not 'bads'

In truth, taxation can be arbitrary. Many economists agree that it makes sense to tax gasoline (a "bad") more heavily than employment (a "good"). And there are several reasons why the US government should act on this good sense.

Americans' gasoline consumption is holding the United States hostage to potentially hostile governments such as Iran and Venezuela. Consumption of fossil fuels – particularly oil and coal – also pollutes water, land, and air and contributes to global warming.

The US spends billions of dollars every year to ensure that terrorists don't interrupt the flow of oil. If higher energy taxes will help Americans reduce their dependence on fossil fuels, then by all means the government should implement them.

On the other hand, Americans work hard at their jobs, and they should be amply compensated for the time and effort they put in. Workers should be allowed to keep as much as possible of their income – after all, they earned it.

Of course driving is a daily essential for some people, but these folks will be better able to afford higher gas prices if they can take home a higher percentage of their wages.

Liberal and conservative support

An increasing number of liberals, such as Al Gore, and conservatives, such as Texas oil billionaire T. Boone Pickens, are publicly supporting the idea of taxing energy more and work less.

Mr. Gore, in fact, has proposed that pollution taxes and carbon taxes on oil and coal be used to eliminate the payroll taxes that are now used to finance Social Security, Medicare, and unemployment insurance.

Mr. Pickens proposes that the US hike gasoline taxes enough to raise the price of gasoline to five dollars a gallon and use the revenues to cut the payroll taxes paid by employees and employers.

Follow Europe's lead

All across Europe – where energy taxes are already much higher than in the US – governments are already cutting payroll taxes. Why? Because they want to boost employment.

By cutting payroll tax rates, European leaders are encouraging more people to work and making their workers more competitive in the global marketplace.

If the US wants to reduce the outsourcing of jobs to overseas workers, then Congress should be following Europe's lead. Payroll taxes increase the costs of hiring US workers.

So why shouldn't the US be taxing earnings less and taxing our consumption of energy more?

Good question. Let's see whether Congress is smarter than a fifth-grader.

• *Robert Walker is president of Get America Working!, a bipartisan organization in Arlington, Va., that strives to create jobs through structural changes in the US economy.*

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