

Name \_\_\_\_\_

Final Exam - Public Finance - 180.365  
Fall, 2003  
Answers

You must answer all components of all four parts of the exam. If you run out of space, use the back of the previous page.

The first part of the exam requires you to read the essay, written by Baby Boomer newspaper columnist Steve Chapman, being passed out with the exam.

## Meet the Greedy Grandparents by Steve Chapman

From gratefully accepting a basic level of assistance back in the early decades of Social Security, America's elderly have come to expect from the government everything their durable little hearts desire. They often get their way, as they did recently when years of complaints finally induced Congress and the president to agree that younger taxpayers should bear much of the cost of their prescription drugs. From the tenor of the debate, you would think these medications were a terrible burden inflicted by an uncaring fate. In fact, past generations of old people didn't have to make room in their budgets for pharmaceuticals because there weren't many to buy. Today, there are pills and potions for just about any complaint. It's not enough to be blessed with medical miracles.<sup>1</sup> Modern seniors also want them cheap. That's on top of everything else they get. In recent years, the federal government has begun to look like an appendage of Social Security. In 2000, 35 percent of all federal spending dollars went to Social Security and Medicare. By 2040, barring an increase in total federal outlays, they'll account for more than 60 percent of the budget. And that's before you add in the prescription drug benefit.

Retirees eyeing this bounty feel no pangs of guilt, though economists Laurence Kotlikoff and Jagadeesh Gokhale say that a typical man reaching age 65 today will get a net windfall of more than \$70,000 over his remaining years. A luckless 25-year-old, by contrast, can count on paying in much more payroll taxes than he will ever get back in benefits. The Congressional Budget Office estimates \$322,000 more.<sup>2</sup>

Why do we keep indulging the grizzled ones? The most obvious reason is that they are so tireless and well organized in demanding alms.<sup>3</sup> No politician ever lost an election because he was too generous to little old ladies. A lot of people are suckered by the image of financially strapped seniors,<sup>4</sup> even though the poverty rate among those 65 and over has been lower than that for the population as a whole since 1974.<sup>5</sup> Working-age folks also assume that whatever they bestow upon today's seniors will be likewise bestowed on them, and in the not too distant future.<sup>6</sup>

It's not really fair to blame the greatest generation (those over 70) for this extravagance.<sup>7</sup> They are guilty, but they have an accomplice. It's surely no coincidence that the new drug benefit is being enacted just as the first baby boomers are nearing retirement age. Nor can it be forgotten that the organization formerly known as the American Association of Retired People-it's now just AARP-has lately broadened its membership to include all the boomers it can get its wrinkled hands on. AARP, to the surprise of many, endorsed the plan. And what a surprise it is that the prescription drug program, which will cost some \$400 billion over the next 10 years, could balloon to \$2 trillion in the 10 years following that, when guess-who will be collecting.<sup>8</sup> You would expect taxpayers in their peak earning years (boomers) to recoil in horror from a program that will vastly increase Washington's fiscal obligations for decades to come. In fact, they (make that we) can see that the time to lock in a prosperous old age is now, before twentysomethings know what's hit them.<sup>9</sup> Boomers have gotten our way ever since we arrived in this world, and the onset of gray hair, bifocals, and arthritis is not going to moderate our unswerving self-indulgence. We are the same people, after all, who forced the lowering of the drinking age when we were young, so we could drink, and forced it back up when we got older, so our kids couldn't. On top of that, we're used to the best of everything, and plenty of

---

1  
2  
3  
4  
5  
6  
7  
8  
9

it. We weren't dubbed the Me Generation because we neglect our own needs, Junior. If politicians think the current geezers are greedy, they ain't seen nothin' yet. Payroll taxes will have to more than double by 2040<sup>10</sup>-on top of whatever it costs to buy all those prescription drugs. At that point, our children will realize the trick we've pulled and start to hate our guts.

## Part I. Questions Based on Essay.

Discussion of the essay will proceed as follows. Various important passages have been followed by a footnote. I will begin each question by identifying exactly the material the question refers to. For example, if the question begins “The two sentences leading up to footnote 3,” then the question will concern the two sentences “Why do we keep indulging the grizzled ones? The most obvious reason is that they are so tireless and well organized in demanding alms.”

1. The four sentences leading up to footnote 1.

- (a) Explain in intuitive terms why, according to additive utilitarian social welfare analysis, maximizing social welfare requires redistributing income in order to equate marginal utility across households.

*Answer:*

If marginal utility were different for any two people in the economy, total social welfare could be increased by taking money from the person with low marginal utility and giving it to the person with higher marginal utility.

- (b) Consider an economy with two people in it, labeled  $y$  and  $o$  and a government that can take taxes  $T$  from person  $y$  and give the money to person  $o$ . If taxes are zero, person  $y$  has income  $n_y$  and person  $o$  has income  $n_o$ . Suppose the respective marginal utilities of the two people are

$$\mu_y = a - (n_y - T) \quad (1)$$

$$\mu_o = b - (n_o + T) \quad (2)$$

Solve for the socially optimal level of  $T$  and explain your formula in intuitive terms. In particular, discuss how  $T$  changes if  $b$  goes up, and why. Explain why an increase in  $b$  could plausibly be interpreted as the effect of the invention of a new, effective, but expensive drug that cures person  $o$  of some health problem.

*Answer:*

Setting the marginal utility of  $o$  and  $y$  equal,  $\mu_o = \mu_y = \mu$ ,

$$a - (n_y - T) = b - (n_o + T) \quad (3)$$

$$a - n_y + n_o - b + T = -n_o - T \quad (4)$$

$$2T = (b - a) + n_y - n_o \quad (5)$$

$$T = ((b - a) + n_y - n_o)/2 \quad (6)$$

Intuitively, the tax rate on  $y$  will be higher if  $b$  is larger because this means  $o$  extracts more utility from each dollar of income; or if the income of  $y$  is greater than the income of  $o$ .

An increase in  $b$  can be interpreted as the effect of the invention of the drug because person  $o$  ‘wants’ to buy the new drug (since it cures him of a health problem), which means that the marginal utility of income is higher because there is a valuable new use for income.

- (c) Taking the above analysis into account, discuss Chapman’s implicit argument that since the elderly are made better off by the medicines, it doesn’t make sense for them to demand help in paying for them.

*Answer:*

Chapman's argument can be thought of as reflecting a confusion between the level of utility (the elderly are definitely better off because of the invention of the medicines) with the effect of the availability of the medicines on marginal utility (which is increased precisely because of the desirability of the medicines). So his implicit argument here does not really make sense.

2. The half-sentence ended by footnote 4, plus the sentence before that.

Suppose Chapman is right that society cannot resist giving money to elderly people if they are impoverished (or we think they are). How might this be used to argue that a Social Security system is necessary?

*Answer:*

This is the 'Samaritan's Dilemma' argument for Social Security: If everyone knows that society will not permit elderly people to live in poverty, then some people will choose to save nothing and arrive at retirement age with no assets, because they know that society will 'bail them out.' Therefore a Social Security system is necessary because it is the only way to force those people to participate in the system: Make them pay Social Security taxes when young.

3. The two sentences ended by footnote 3.

What point in political economy might explain why the people who receive Social Security benefits might be more 'tireless' and 'well-organized' in demanding 'alms.' (The word 'alms' means 'charity').

*Answer:*

This is an example of 'diffuse versus concentrated interests.' Since the benefits received are much larger than the taxes paid, the beneficiaries have much more incentive to organize to protect and increase their benefits. (It also helps that the beneficiaries are mostly retired and therefore have plenty of time on their hands to agitate for more benefits, though you need not have mentioned this point to get credit).

4. Consider a society in which consumers have only two periods of life, 'youth' and 'old age.' Assume that the society always has a constant population, constant interest rates, and zero economic growth.

Suppose that up until period  $t$  there is no government of any kind (including no Medicare system), but in period  $t$  a Pay As You Go Medicare system is introduced with a per-capita tax rate on the young of  $\bar{\tau}$ , and everyone expects the Medicare system, the population, the tax rate on the young, and economic growth to stay the same size in the future.

- (a) The half-sentence ending in 10.

Calculate the generational accounts (GA's) of members the generation born at time  $t - 1$ , at time  $t$ , and of all future generations. Calculate the difference between the generational account for individuals born at  $t$  and at  $t - 1$  (subtract  $GA_t$  from  $GA_{t-1}$ ) and give an intuitive explanation for the differences across different generations.

*Answer:*

The point of this exercise is that a PAYG Medicare system is analyzed, in terms of its effect on generational accounts, in precisely the same way that we analyze a PAYG Social Security system.

The generational account for the generation born at time  $t - 1$  is

$$GA_{t-1} = \tau_{y,t-1} + \tau_{o,t}/R \quad (7)$$

$$= 0 + \tau_{o,t}/R \quad (8)$$

$$= -\bar{\tau}/R \quad (9)$$

where  $\tau_{y,t-1} = 0$  because there was no Medicare system when this generation was young, so they paid no taxes.  $\tau_{o,t} = -\bar{\tau}$  because in period  $t$  the amount of tax revenues raised from the young,  $\bar{\tau}$ , is immediately paid out to the old, who therefore receive  $-\bar{\tau}$ . Finally, the GA is calculated as of the beginning of life for the generation born at time  $t - 1$  so it is equal to the PDV of the amount they will receive when old. The fact that this generation's GA is negative means that they get more out of Medicare than they put in, in present discounted value terms.

The generational account for the generation born at time  $t$  is

$$GA_t = \tau_{y,t} + \tau_{o,t+1}/R \quad (10)$$

$$= \bar{\tau}(1 - 1/R) \quad (11)$$

$$= \bar{\tau}(R/R - 1/R) \quad (12)$$

$$= \bar{\tau}(r/R). \quad (13)$$

The fact that this generation has a positive generational account means they pay more in taxes than they receive in benefits.

The difference between the GA's is

$$GA_t - GA_{t-1} = \bar{\tau}(r/R + 1/R) \quad (14)$$

$$= \bar{\tau} \quad (15)$$

So the difference between the two generations corresponds exactly to the amount of money being transferred from the young to the old generation as a result of the Medicare program.

(b) The paragraph leading up to footnote 9.

Now suppose that the “boomer” generation that is young at time  $t$  is 20 percent larger than all other generations born before and after it. Calculate the difference between the generational accounts for members of the boomer and the “buster” (post-boomer) generations under the assumption that per-capita Medicare benefits for the elderly are maintained at the level  $\tau_o$  across all generations who are old after period  $t$  (and taxes on the young are adjusted to raise the necessary amount of revenues in every period). Very Important Hint: Start by writing the generational accounts for a member of each of the two generations in theoretical terms and subtract them, then calculate the required tax rates for the young in each generation.

*Answer:*

$$GA_t = \tau_{y,t} + \tau_o/R \quad (16)$$

$$GA_{t+1} = \tau_{y,t+1} + \tau_o/R \quad (17)$$

so the *difference* is simply the difference in taxes when young.

Call the per-capita benefits received by the old  $\tau_o$ . Then the PAYG assumption means that

$$\tau_{y,t} = -(P_{t-1}/P_t)\tau_o \quad (18)$$

$$= (-1/1.2)\tau_o \quad (19)$$

$$\tau_{y,t+1} = -(P_t/P_{t+1})\tau_o \quad (20)$$

$$= -(1.2/1)\tau_o \quad (21)$$

$$\tau_{y,t+1} - \tau_{y,t} = (-(1.2/1) - (-1/1.2))\tau_o \quad (22)$$

$$\approx -0.37\tau_o \quad (23)$$

so the difference in the generational accounts is about 0.37 times the size of the Medicare benefit. (You could also have answered “about 40 percent” of the size of the Medicare benefit; you also get most of the points if you calculated the ratio of taxes when young for the busters to taxes when young for the boomers,  $1.2*1.2 = 1.44$ , though that is not what the question asked for.

(c) The text between footnote 7 and 9.

Suppose now that at the beginning of period  $t+1$  (after they have paid their own Medicare taxes but before they start drawing benefits), the boomers make the politicians create a new drug benefit for Medicare that increases  $\tau_{o,t+1}$  by another 20 percent (assume that this is a permanent increase so that the buster generation can expect  $\tau_{o,t+2} = \tau_{o,t+1}$ ). Calculate the effect of this on the difference between the GA’s of the boomer and buster generations.

*Answer:*

Since the boomers have already paid their taxes, the increase in Medicare tax has no effect on their  $\tau_{y,t}$ . And as before, since  $\tau_{o,t+1} = \tau_{o,t+2}$  the second components of the GA’s of the boomer and buster generations are the same. But the GA’s of the busters are increased by the immediate increase in taxes. Using the PAYG formula:

$$\tau_{y,t+1} = -(P_t/P_{t+1})\tau_{o,t+1} \quad (24)$$

$$= -1.20\tau_o1.20 \quad (25)$$

and before the new tax hike we had  $\tau_{y,t+1} = -1.20\tau_o$  so the further expansion of Medicare worsens the GA’s of the busters *compared* to the boomers by  $0.20*1.20\tau_o = 0.24\tau_o$ .

5. The half-sentence beginning “even though ...” and ending at footnote 5.

(a) Before 1974, the poverty rate of the elderly was generally greater than the poverty rate of the general population. From the history of Social Security discussed in class, make a guess about why the poverty rate of the elderly has been lower since the early 70s.

*Answer:*

There was a big increase in Social Security benefits in the early 1970s that probably has a lot to do with why poverty rates for the elderly have been lower since that time.

- (b) The elderly are now the richest component of the population; less than 10 percent of the elderly live in poverty, and there are many tax breaks available only or mainly for them (for example, Social Security benefits are not fully taxed). Given this, what would the basic utilitarian theory of income distribution say about the generational accounting effects of the new Medicare bill are socially desirable?

*Answer:*

Utilitarian theory basically says you should take money away from those who have more and give it to those who have less. Thus utilitarian theory would suggest that giving money to the richest age group in the population may not be socially optimal.

6. Discuss the effect on government primary and total deficits of introducing the PAYG Medicare system. Do deficits serve as a good measure of the effect of government policy on the population (that is, do zero deficits tell you that the government is doing nothing?)

*Answer:*

As for the effect on budget deficits, the deficit is the difference between taxes coming in and benefits flowing out. Since we are examining a PAYG system in which benefits flowing out are equal to taxes coming in in every period, the budget deficit is zero in every period.

The first 5 parts of this question show that there are extensive economic effects on different generations of introducing and changing the Medicare system. But none of the policy changes has any effect on the deficit. So obviously zero deficits do not tell you that the government is doing nothing!

## Part II. Short Discussion Questions.

1. Explain why most taxes impose an excess burden, but lump-sum taxes do not. What is the main disadvantage of lump-sum taxes?

*Answer:* Excess burden arises when a tax changes the effective relative prices of goods and people adjust their consumption of the goods in response. Because lump sum taxes do not change any relative prices, they impose no excess burden. However, lump sum taxes are highly regressive, because rich and poor people have to pay the same dollar amount of tax. Utilitarian theory implies that the disutility caused by a given payment is much greater for low-income than for high-income people, so lump sum taxes may reduce social welfare even if they are perfectly “efficient” in terms of causing no excess burden

2. Suppose the Maryland legislature passes a law requiring that \$1 billion a year be raised via two new taxes, one on good  $X$  and another on good  $Y$ , but leaves the choice up to the governor what rates to choose for  $t_x$  and  $t_y$ . Suppose that these goods are produced by competitive industries at constant marginal cost, and suppose the demand and supply curves for each kind of good are known, and the goods are neither complements nor substitutes. How should the governor choose the various tax rates to minimize the total excess burden raised by the new taxes? Finally, suppose that demand for good  $X$  is less elastic than demand for good  $Y$ . Does that mean the tax rate on  $X$  will be higher or lower? If the reason  $X$  demand is less elastic is that richer people consume more  $X$  and they can afford the extra taxes, does this undermine or enhance the case for the tax scheme you proposed?

*Answer:*

The Ramsey Rule says that excess burden is minimized by setting the *marginal* excess burden of the last dollar of revenue raised from each commodity must to be the same. If supply curves are perfectly elastic, this says that the ratio of tax rates should be the inverse of the ratio of elasticities of demand. If demand for  $X$  is less elastic, this means the tax rate on  $X$  should be higher. Although often the Ramsey rule produces policy recommendations that are unattractive on equity grounds (e.g. tax insulin because people who need it can't decide not to buy it), in this case if  $X$  is disproportionately consumed by richer consumers then fairness considerations do not undermine the Ramsey rule, but instead reinforce it.

3. Anti-lock brakes help prevent cars from skidding out of control when the driver slams on the brakes. For several years, carmakers and insurance companies have been promoting anti-lock brakes as a safety feature. However, a recent study found that accident rates for cars with anti-lock brakes are no lower than for the same model cars without anti-lock brakes. Explain how this finding could be a result of either adverse selection or moral hazard, even if anti-lock brakes do have safety benefits.

*Answer:*

It could be an example of moral hazard if people who know their cars have antilock brakes tend to take more risks, for example by being more willing to take the car out for a drive when the roads are covered in snow. It could be an example of adverse selection if people who know they are bad drivers and need extra safety features are more likely to buy cars with antilock brakes.

4. In Montana, there are some large deposits of water containing dissolved methane (fossil fuel). It is possible to pump this water out of the ground and release the methane, which can then be sold. This process produces lots of waste water, which has poisonous properties, which is being dumped into nearby streams, which then flow onto the land of downstream ranches, severely damaging the land. Discuss this problem using the tools of public finance and propose two solutions, one involving taxes and the other involving property rights.

*Answer:*

The dumped water produces an externality for the downstream users of the stream. A standard solution is a tax on the amount of bad water produced. Another solution (suggested by the Coase theorem) would be to give the property right to clean water to the ranchers below the stream and then let them negotiate with the mine owners.

5. In the last few days, the news media has been full of stories about this year's flu season and the shortage of flu vaccine. But suppose this were a normal year and there were more than enough doses of vaccine to give to everyone who wanted one.

- (a) Suppose there were no medical insurance, and suppose that flu vaccine is produced by a competitive producer, so the cost of getting vaccinated is equal to the marginal cost of producing one more dose of vaccine (say, \$10). Assume there are some people who are allergic to the vaccine and therefore cannot be vaccinated. What feature of this particular market would lead you to expect that the outcome produced by the free market will not be socially efficient? (Hint: The answer I am looking for is related to the fact that if you catch the flu, you might give it to someone else). What kind of public policy response does standard economic theory suggest to this kind of problem? Can this logic explain why some private institutions give free flu shots to their employees?

*Answer:*

As the hint indicates, my decision not to get vaccinated produces an *externality*: It affects your chances of getting sick in a way that is not compensated by efficient market prices. One solution is to subsidize people to get vaccinated. And we do see subsidies in the real world. For example, Hopkins offer free flu shots to students, faculty, and staff every year. And most primary schools also offer free vaccinations.

- (b) Children who have the flu are more infectious than prime-age adults. Elderly people can die of the flu. Suppose there is a shortage of flu vaccine and it must be rationed. Use the logic and terminology of public finance theory to explain the logic of why children and the elderly should be vaccinated before prime-age adults. (You *must* use proper public finance terminology in your answer).

*Answer:*

The fact that children are more infectious means that the negative externality associated with an unvaccinated child is larger than the negative externality associated with an unvaccinated adult. Hence the marginal value of vaccinating children is higher, and thus vaccine should go to them before it goes to adults.

The fact that the elderly can die of the flu means that the marginal utility of getting vaccinated is higher for them than for prime-age adults. If the vaccine is rationed, then the available supply should go first to the people with the highest marginal utility.

6. Consider a tax system in which people are taxed at a marginal rate of 2 percent on the first \$10,000 of their income and at a marginal rate of 30 percent on any income above \$10,000. Thus, someone earning \$20,000 would pay  $0.02(10,000) + 0.30(20,000 - 10,000) = \$200 + \$3000 = \$3200$  of taxes.

A politician comes along and proposes a two-part tax cut: Tax rates on the first \$10,000 of income would drop to 1 percent, and marginal tax rates on income above \$10,000 would drop to 20 percent. Evaluate the politician's claim that this tax cut is targeted toward low income households because "the proportion of tax revenue coming from people earning less than \$10,000 will fall." To analyze this, assume there are only two people in this economy: One person with an income of \$5000 and one person with an income of \$100,000.

In your answer, use the following measure of progressivity from class:

$$P = (T_1/I_1 - T_0/I_0)/(I_1 - I_0), \quad (26)$$

where person 1 is the rich person and person 0 is the poor one. In your answer, use the symbols  $P$  and  $P'$  to designate progressivity of the tax system before and after the tax cut, respectively.

*Answer:*

Total revenues before the tax cut are  $5000 \cdot 0.02 = \$100$  from the poor person and  $10000 \cdot 0.02 + (100,000 - 10,000) \cdot 0.30 = \$200 + \$27,000 = \$27,200$  from the rich person. Total revenues after the tax cut are  $5000 \cdot 0.01 = \$50$  from the poor person and  $10000 \cdot 0.01 + (100,000 - 10,000) \cdot 0.20 = \$100 + \$18,000 = \$18,100$ . So the fraction of revenues raised from the poor person goes from  $\$100/\$27,200$  to  $\$50/\$18,100 = \$100/\$36,200$  so it is true that the proportion of revenues raised from the rich person rises. However, the rich person gets a tax cut of \$9100 or 9.1 percent of their income while the poor person gets a tax cut of only \$50 or 1 percent of their income.

$$P = (27200/100000 - 0.02)/95000 \quad (27)$$

$$= (0.272 - 0.02)/95000 \quad (28)$$

$$= 0.252/95000 \quad (29)$$

$$P' = (18100/100000 - 0.01)/95000 \quad (30)$$

$$= 0.171/95000 \quad (31)$$

so according to this measure progressivity declines when the tax cut is implemented.

More broadly, it seems absurd to claim that a tax reform that cuts taxes by 1 percent of their income for people earning \$5000, (\$50) but by 9.1 percent of their income (\$9100) for people earning \$100,000, is targeted toward low income households.

(It is a separate question whether the original situation, in which the rich person pays almost all of the tax, is a fair one.)

7. Consider the market for airline tickets. For the purpose of answering this question, suppose the airlines are perfectly competitive (absurd, I know, but assume it anyway) and produce miles of travel at a constant marginal cost.

- (a) Draw a diagram of this market, where the horizontal axis is total miles flown in a year, and the vertical axis is price per mile. Show the effect on this market of imposing a tax of \$1 a mile on the producer. Label the diagram and identify the areas on the diagram that correspond to: total consumer surplus before the tax; consumer surplus after the tax; tax revenues raised; total deadweight loss caused by the tax. Calling  $P_1$  the initial price,  $q_1$  the initial quantity,  $e_1$  the elasticity of demand, and  $t$  the tax rate, reproduce the formula for excess burden from class and explain why each of the variables in the formula is related to the size of excess burden.

*Answer:*

This is basically straight from Rosen figure 14-5 from the class notes; just relabel “pounds of barley” as “airline miles.”

Consumer surplus before tax:	aih
Consumer surplus after tax:	afg
Tax revenues:	gfdh=( $q_2$ *\$1)
Deadweight loss/excess burden:	fid

The formula for excess burden is

$$B = (1/2)(q_1 e_1 P_1 t^2). \tag{32}$$

Excess burden is larger if each of these is larger for the following reason:

$q_1$  If this is a big market (more quantity), then the size of the burden is larger

$P_1$  If this is a market for expensive goods (higher price), then the size of the burden is larger (in dollars)

$e_1$  If demand is highly responsive to price, then the market will be distorted more by the tax

$t^2$  Excess burden is proportional to the square of the tax rate because taxes affect both price and quantity

- (b) Now suppose that overall air travel demand consists of two parts: Demand for personal travel, and demand for business travel. Suppose that demand for personal travel is much more price elastic. Finally, suppose that all business travel is booked less than two weeks in advance, and all personal travel is booked more than two weeks in advance. How does public finance theory suggest changing the airline tax system to reduce excess burden?

*Answer:*

There should be a tax higher than \$1 a mile for tickets purchased less than two weeks in advance and less than \$1 a mile for tickets purchased more than two weeks in advance, because the excess burden associated with taxing something that has inelastic demand is less than the excess burden associated with taxing something that has highly elastic demand.

8. After years of terrible traffic congestion, the City of London recently started charging a toll for any car that wanted to enter the city limits. Explain how public finance theory would describe the cause of the congestion problem, and explain why imposing a toll can achieve an efficient solution. What does theory say is the level of the toll that will produce the efficient result?

*Answer:*

This is a classic example of a congestion externality. As with all externalities, theory suggests the good producing the externality should be taxed. The efficient level of the toll is the level at which the marginal social cost of the last car entering the city is equal to the toll.

### **Part III. Multiple Choice Questions.**

Write the letter corresponding to the correct answer in the space to the left of the question.

- b. 1. Consider replacing the current US tax system with a proportional tax in which everyone would pay a constant fraction of their wages, and there would be no other taxes. Compared to the current personal tax system:
- (a) The proportional tax would increase the amount of personal saving.
  - (b) The proportional tax would make the tax system less progressive than it is now.
  - (c) The proportional tax would increase the number of hours people work.
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)

*Answer:*

Under the current system, the first \$6000 of income is untaxed, then tax rates rise progressively higher as income rises, peaking at rates of 40 percent or more. Thus the proportional tax would increase taxes for people with incomes under \$6000, and reduce them for people paying the highest rates. This is a clear reduction in progressivity. The effects on hours worked and savings are ambiguous. For some people, wage taxes go up and for others they go down. Interest taxes go up for some and down for others, but empirical evidence is that the relationship between interest taxes and saving is ambiguous anyway so we can't say whether overall saving would rise or fall.

- b. 2. If the exact same medication sells for different prices in different countries, this proves
- (a) Social welfare would be higher if drug makers had to sell their products at marginal cost
  - (b) The market for this medication is Pareto inefficient
  - (c) Government has intervened in the market where the price is lower
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)

*Answer:*

See hour exam 2.

- c. 3. Economic theory can justify which of the following claims about the effect of an increase in wage taxes:
- (a) It will increase equilibrium labor supply
  - (b) It will decrease equilibrium labor supply
  - (c) The effect will differ for households with different preferences
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)
- d. 4. The 'marriage penalty' in the existing tax code:
- (a) Cannot be eliminated if we want to tax total household income progressively
  - (b) Creates a bias in favor of the 'traditional family' in which one spouse stays home to take care of the kids
  - (c) Could be eliminated by allowing individual members of a married couple to file taxes as though they were still single
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)

*Answer:*

See class notes, except for (c): If there is progressive tax system for singles, then the member of a couple with higher income is facing a higher marginal rate and if she can transfer income to her lower-income husband (who pays a lower rate) then the total household tax burden declines.

- d. 5. The incidence of a tax depends on
- (a) The elasticity of demand in the market
  - (b) The market structure (competition, monopoly)
  - (c) The production function for the good
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)

*Answer:*

- b. 6. Last week, the Supreme Court let stand the campaign finance reform legislation Congress passed last year, which limits the ability of special interest groups to give campaign money to political parties and candidates. Among the groups opposed to the decision were both conservative and liberal organizations, ranging from the AARP to the National Rifle Association. Which theory of political economy could explain such ideological diversity among opponents?
- (a) The organic philosophy
  - (b) The theory of diffuse versus concentrated interests
  - (c) The Niskanen hypothesis
  - (d) Instrumental libertarianism

- d. 7. Suppose someone discovers a set of 50 Picasso prints in their attic, and before the prints can be sold Congress passes a law that says that the buyer of all Picasso artworks must pay the government \$10,000 for every artwork they buy. The person who found the prints hates art and so auctions them off anyway. According to the theory of tax incidence, which of the following is true?
- (a) The statutory incidence of the Picasso tax is on the buyer
  - (b) Economic incidence of the Picasso tax is on the seller
  - (c) The pretax purchase price of the artworks goes down by exactly \$10,000
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)
- d. 8. According to economic theory:
- (a) To achieve Pareto efficiency, prices of drugs should not be allowed to exceed their marginal cost of production
  - (b) Marginal cost pricing would bring a halt to development of new drugs
  - (c) Since knowledge is a public good, economic inefficiency results whenever the formula for a drug is kept secret
  - (d) All of (a)-(c)
  - (e) None of (a)-(c)

**Part IV. True/False Questions.**

- T 1. The knowledge that a Hopkins student won a Rhodes scholarship this year is a public good.
- T 2. Postwar economic history suggests that if the right institutions and government policies can be implemented in Iraq, it can become a prosperous country.
- F 3. The economic theory of insurance says that insurance is most valuable when it is used frequently. Thus, an insurance plan should focus on covering the risks that are most likely to happen.
- F 4. According to the play “A Man for All Seasons,” the Catholic saint Sir Thomas More believed that the purpose of human laws was to accomplish the will of God, and so it was OK sometimes to violate a human law in order to prevent something evil from happening.

*Answer:*

This question is reproduced from the first hour exam, because a lot of people missed it.

- F 5. A utilitarian analysis would say that the fact that income inequality is greater in the United States than elsewhere means that overall social utility per person is lower in the US than in other countries.

*Answer:*

This question is reproduced from the second hour exam because a lot of people missed it.