

Homework Assignment 1 Solution.

I generally write more than was expected of you to get a full credit.

1. Which tax is the largest source of the federal government's revenue? Which is the second largest?

This information is provided on the page 15 of the textbook. The largest source of income of federal government is individual income tax; the second largest tax is social insurance tax.

2. (problem #3 on page 17) Obesity is perceived to be a national health problem in the United States. One suggestion to deal with this problem is a "fat tax". The idea is to levy a tax on foods containing more than a government prescribed percentage of the daily minimal fat intake. Is such a tax consistent with a mechanistic view of the government?

No, "fat tax" is not consistent with the mechanistic view of the government. Recall that according to this view government is created as a collective agreement among individuals in the society. The purpose of such government is to help each individual achieve her own goals. Now, each obese individual may or may not perceive her/his own obesity as something negative and try to lose some weight. Some people enjoy cheesecakes and pork-chops and don't care about extra pounds that they put on while eating. In other words, it's up to each individual whether or not (s)he cares about obesity or not. Government, which doesn't want any obese people, is not promoting the welfare of any individual, obese or not. People can decide themselves whether or not they want to have those pounds on them or not.

There one possible justification of "fat tax" that could be interpreted as coming from mechanistic-style government is when we believe that individuals are irrational in the sense that they cannot control themselves once they are in the restaurant or grocery store. Before they get there they think that they're going to get something healthy with just a few calories, but once in the restaurant they cannot resist that really tasty burger and hate themselves afterwards. In other words, they have self-control problems. If that's the case, individuals would prefer someone else to restrict their options (government would make unhealthy food more expensive).

The bottom-line is that if a tax is imposed because obesity is a "national problem" and not because it was chosen by people in the society, it is not consistent with mechanistic view of the government.

3. Do you think it is correct policy that the federal government is not required to finance all of its expenditures with tax revenues and is allowed to borrow? What are the implications of this policy? When do you think budget deficits are justified?

There could be a variety of possible answers as to correctness part of the question. If government manages to keep its spending equal to its tax revenues, there are no budget deficits and government doesn't have to borrow to finance the difference between spending and tax revenues. One can justify budget deficits in times of crisis (such as war). Without running deficits government wouldn't be able to accomplish its goals.

4. The Law of Demand states that there is an inverse relationship between price and quantity demanded. Is this positive or normative statement?

This is positive statement. The Law of Demand indeed states that there is an inverse relationship between price and quantity demanded. Any economics textbook will tell you so. In other words, the formulation of the Law of Demand is a fact. We can look at the statement above in a different light – whether or not “there is an inverse relationship between price and quantity demanded” is a positive statement. Even though there can be some disagreement, it is generally accepted fact that there actually is negative relationship between price and quantity demanded. Either way, no value judgments are expressed, so the statement is positive.

5. It is possible that two different economists can examine the same situation, such as effect of taxes on labor supply, and reach entirely different conclusions. Why is this so?

Because the (positive) methods of modern economics are imperfect in the sense that it is virtually impossible to say what is happening with 100% certainty. The real world is too complex relative to the (explanatory, predictive) strength of economic methods.

6. In a regression equation, what is the error term intended to capture?

The error term captures the influence of all other relevant variables not already included in the regression equation. Generally, researcher doesn't even know what most of these relevant variables are. (If she knew some relevant variable is not included in the regression equation and she had the data – the variable would likely be included.)

7. Name at least three potential problems associated with the multiple regression analysis.

- **Population heterogeneity in behavioral responses (i.e., parameters are different across people);**
- **Parameters may change over time;**
- **Omitted relevant variables;**
- **Measurement error in data;**
- **Endogeneity of some explanatory variables.**

8. Consider a simple two-person exchange economy. John and Michael consume two goods – beer and books. Currently, John consumes 7 books and 5 six-packs of beer;

Michael consumes 5 books and 7 six-packs of beer. John's marginal rate of substitution of beer for books is one ($MRS_{bb}^J = 1 = MU_{beer}^J / MU_{books}^J$), Michael's marginal rate of substitution of beer for books is 2 ($MRS_{bb}^M = 2 = MU_{beer}^M / MU_{books}^M$). Is this allocation Pareto efficient? Is so, explain why. If not, show a possible Pareto improvement. Also, is the allocation after your proposed improvement Pareto efficient?

Pareto improvement: I take one book from Mike (he loses X units of utility) and give it to John (he gains Y units of utility). Now, I take one 6-pack of beer from John (he loses exactly Y units of utility because $MU_{beer}^J = MU_{books}^J$) and give it to Mike (he gains 2X units of utility because $MU_{beer}^M = 2MU_{books}^M$). John is as well off as before, while Mike is better off (by X units of utility).

The resulting allocation may or may not be Pareto efficient. The answer to this part would be that 'there is not enough information to say whether the resulting allocation is Pareto efficient. One needs to know the exact functional forms of utility functions to know how MRsS would change.'

9. What are the requirements of the First Fundamental Theorem of Welfare?

- **Competitive markets (no monopolistic power)**
- **Existence of markets for all commodities.**

10. Consider a simple exchange economy where there are two citizens, Mr. Cortopassi and Ms. Thomas. There are only two goods to be consumed in the economy, Beer and Pretzels. The total amount of Beer is 12 units. The total amount of Pretzels is 12 units. Answer the following: Suppose Mr. Cortopassi has utility for the two goods characterized as $U_C(B,P) = B+P$. Ms. Thomas's utility function is $U_T(B,P) = B+P$. Identify the points that are Pareto efficient.

The key fact here is that Indifference Curves for both Mr.C. and Mr.T. are straight lines with slopes (MRS) equal to -1. For example, suppose Mr.C. consumes 5 beers and 5 pretzels. If you take one beer from him and give him one pretzel instead, his utility is going to be exactly the same – two allocations are on the same indifference curve. The slope is -1 because goods can be exchanged one-for-one to keep Mr.C. on the same indifference curve.

We know that Pareto efficient points can be found where indifference curves of two persons involved are tangent (do not cross). Note if two straight lines with exactly the same slopes touch at one point – they touch everywhere – they coincide. It should be clear that in the Edgeworth box of this economy all points are Pareto efficient because there is an IC through each point and ICs of both Mr.C. and Mr.T. will just touch there.