

**Final Exam**  
(100 points)

- (10 pts) 1. What exactly does the Arrow impossibility theorem tell us?
- (10 pts) 2. Define "externality" and provide "big picture" (thoughtful and complete) information about the economic significance of this term. [Economic "significance" is not the same as everything you know about externalities.]
- (15 pts) 3. Diagram both equivalent surplus and equivalent variation on the same 2-axis graph. Clearly label all graph components, and clearly explain the meaning and "origin" (where you get it from) of every graph component except for the axes. Given the strong similarities between these two measures (same normative criteria, for example) and given that each price corresponds to a single quantity on the curve(s) you've drawn, why do we need to observe two different measures here? That is, what's the real difference?
- (15 pts) 4. What are the two rules which theoretically emerge about the general equilibrium interpretation of welfare results using statistically estimated supply and demand curves? Be clear. What's the distinction between partial equilibrium and general equilibrium?
- (15 pts) 5. According to one of our class readings,
- "There may be small benefits from correcting the Marshallian measures for income effects. However, the costs are likely to be small, too, and there seems to be little justification for using a biased measure."

Please explain this.

6. Local government regulates the price charged by the only local provider/producer of product V, which is a basic commodity used by all households (like natural gas, electricity, or garbage pick-up). The producer is requesting that it be allowed to raise V's price from \$400 to \$500 per unit, because of a recent rise in the price of a crucial production input, U, from \$40 to \$60. [V producers don't demand enough U to affect its price noticeably.] Recently, the quantity of V demanded by all local households has been 240 per year at the regulated price, and the producer has been using 1200 units of U. Your task will be to perform a policy analysis of the provider's request.

Although the price of V is locally invariant, it varies from locale to locale. An econometric study of demand, using data from many regions, suggests that the price elasticity of V demand is about -0.5. Recently, a study commissioned by U suppliers indicated that the partial-equilibrium price elasticity of U demand by V suppliers is about -0.5 as well. Furthermore, there is other evidence that a \$10 rise in the price of V has tended to increase U demand by 45 units.

(25 pts)

- a. Compose a quantitative policy analysis for the local government using the above information. Presume that demand/supply functional forms in the U marketplace are linear (i.e.  $X=a+bY$ ) and that demand/supply in the V marketplace are constant elasticity forms (i.e.  $X=aY^b$ ). As the baseline, prepolicy situation, presume  $(V_0, U_0, p_0^V, p_0^U) = (240, 1200, 400, 40)$ . Clearly draw and label all welfare measures needing computation. Calculate welfare measures.

(10 pts)

- b. Discuss your monetarization analysis in relation to the welfare measures desired here. What policy recommendations emerge (or should emerge) from your work? Would you approve, disapprove, or modify the request or would you be inconclusive? Why? If V expenditures are significant budget items for some households, what additional analyses/considerations should be contemplated?