204C Final Exam Preparation

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Previous Final Exam Problems

1. **[2016]** Provide three economic reasons for limited liability for owners of stock. That is, explain the problems that would arise if there were unlimited liability by stockholders.
   [2009] Shareholder liability in corporations is limited to the value of the shares. What are the major advantages of this liability limit over unlimited liability?

   (1) To create unity of interest
   Stockholder with greater wealth would be subject to greater losses, so their interests would diverge from those with less wealth, making governance of the firm more difficult.

   (2) To reduce transaction cost
   Transaction costs in buying and selling stock would be much higher. With unlimited liability, the value of the stock would not only depend on the value of the corporation but also on the wealth of the stockholders. Because of the shared risk, an investor would need to constantly monitor the wealth of the other stockholders.

   (3) To appropriately allocate risk
   Distortion of appropriate risk relationships. Stockholders would no longer be risk-neutral nor would they wish to diversify. Stockholders would be more risk-averse than managers, which is problematic and the opposite of the situation under limited liability.

2. **[2009]** Suppose that there are two individuals with consistent subjective probabilities, state independent utility functions. Suppose further that there is only one good but there is aggregate risk so that state of the world 1 yields twice as much of the one good as does state of the world 2. Derive the relationship between relative prices and relative risk.

   Player i maximizes $\Pi_1 U^i(x_{i1}) + \Pi_2 U^i(x_{i2})$ subject to $p_1 x_{i1} + p_2 x_{i2} \leq p_1 e_{i1} + p_2 e_{i2}$.
   The first order interior conditions for the Lagrangian are
   $\Pi_1 U^{i'}(x_{i1}) - \lambda_i p_1 = 0$
   $\Pi_2 U^{i'}(x_{i2}) - \lambda_i p_2 = 0$
   $p_1 e_{i1} + p_2 e_{i2} - p_1 x_{i1} - p_2 x_{i2} = 0$
   The first two FOCs can be simplified as

$$\frac{\Pi_1 U^{i'}(x_{i1})}{p_1} = \frac{\Pi_2 U^{i'}(x_{i2})}{p_2}$$

Suppose $x_{i1} > x_{i2}$. Then $U^{i'}(x_{i1}) < U^{i'}(x_{i2})$. This implies $\frac{\Pi_1}{\Pi_2} > \frac{p_1}{p_2}$.

3. **[2009]** Consider a consumption-only economy with I consumers, 2 time periods, and 2 goods. One of the goods will be money with price normalized to 1. There are a finite number of states of the world, S. Assume that if everyone observes the same set of signals, each person will form the same set of subjective probabilities, that different probabilities lead to different prices, and that the price system is fully revealing of signals.

   A. Define a rational expectations equilibrium in this setting.

   A rational expectations equilibrium exists if $\Pi_s|p(s) = \Pi_{is}|p(s), w_i(s)$.
   In other words, given the prices and the person's own information, the person has no reason to alter his subjective probabilities from the market-determined probabilities.

   B. Define an artificial Walrasian equilibrium.

   Suppose that everyone observes everyone else's signal function and that $w_i(s) = w(s)$. The pooled information equilibrium price, p^*, is the artificial Walrasian equilibrium.

   C. Prove that the artificial Walrasian equilibrium price is a rational expectations equilibrium.

   Since $p(s)$ is fully revealing it can be substituted for $w(s)$ in $\Pi_{is}|w(s)$. But then $\Pi_s|p(s) = \Pi_{is}|p(s), w_i(s)$, since $w_i(s)$ adds nothing to the information set. So an artificial Walrasian equilibrium is also a rational expectation equilibrium.

4. **[2008]** Franchises

   A. Why are McDonald's outlets franchises rather than corporately owned?

   Comparative advantage and transaction costs.
   McDonald's Corporation (franchisor) is better at training and engaging in collective advertising while the local owner (franchisee) has a comparative advantage in managing. The reason for this comparative advantage is transaction costs. Without franchising they couldn't monitor and prevent shirking. Also, the owner-managers can signal that they are high-quality managers by paying up the franchise fee/royalty payment.

   B. Why are McDonald's outlets franchises rather than independently owned?

   The reason is to prevent opportunism by both the franchisor and the franchisee.
   Because the cost of a bad customer experience at one outlet falls not only on the particular franchisee but also on other franchisees, all franchisees are better off, ex-ante, if they police themselves. Essentially, McDonald's Corp. is doing quality monitors on behalves of both the franchieess and itself so that it can sell more franchises in the future. So the owner-manager is not completely independent but faces the possibility of losing her franchise if she does not provide the appropriate quality. Instead of receiving all the money upfront, McDonald's Corp. receives royalties on the sales at outlets, therefore it is interested in continuing to provide subsidiary services e.g. advertising, product development, and quality monitoring.

   C. Why are True-Value hardware stores independently owned rather than franchises?

   Most hardware store businesses are independently owned stores that share in advertising and purchasing. Since most of the stores are local, there are no negative spillover effects. Furthermore, the quality of the products sold in the hardware stores is more dependent on the manufacturers, where

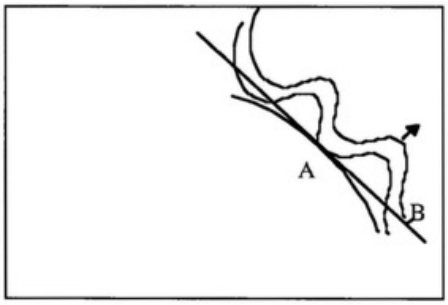
brand name may be important.

D. Why are Safeway grocery stores centrally owned rather than being either a franchise or being completely independent?

Although it is true that a bad experience at one store is likely to spill over to other stores, most of the quality control for Safeway stores is in the more centralized distribution network. The central distribution system would make an independent network more costly to run.

5. **[2008]** Edgeworth-Bowley Box.
Assuming no externalities, provide an example of a Pareto Optimal outcome that is not a Walrasian equilibrium.

Figure 5.2



If the indifference curves are smooth, then an interior W.E. implies tangency. However, even with smooth preference sets, tangency is not sufficient for a W.E. as can be seen in the figure above. Here person 1's indifference curves are sufficiently non-convex that person 1's maximal utility given the budget line is B rather than the tangency point A. That is, 1's preference set intersects the price line, and a W.E. does not exist. In simple terms: tangency but no separating hyperplane. Therefore, no W.E. but P.O.
Note: Of course, even without convexity of the indifference curve, we can have a W.E. (i.e., there exists a separating hyperplane).

6. Walrasian Equilibrium:

A. Define

A Walrasian equilibrium (x_i^*, y_i^*) with price p^* exists in a two-goods, two-person consumption only economy if
(a) for every i, x_i^*, y_i^* is maximal within the budget set
(b) $x_1 + x_2 \leq X$ (i.e. the amount of X available); and $y_1 + y_2 \leq Y$

B. State the 1st and 2nd fundamental theorems of welfare economics.

First:
If preferences are locally non-satiated and if (x_i^*, y_i^*) is a Walrasian equilibrium allocation, then it is Pareto optimal.
Second:
Suppose that the set of preference relations can be characterized by a utility fn. that is twice

differentiable with convex indifference curves and local non-satiability, and the production set can be characterized by a production fn. that is twice differentiable with convex isocost curves. Then every Pareto optimal point is a Walrasian equilibrium for some set of endowments.

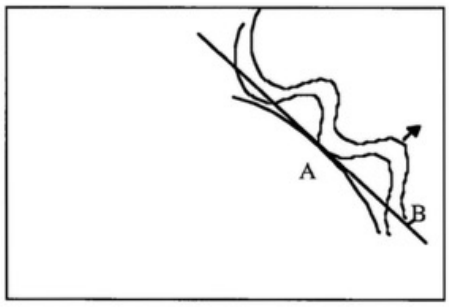
Candidates

1. Walrasian Equlibrium in Edgeworth-Bowley box

   "W.E. in the Edgeworth-Bowley box (for a given set of prices through an initial endowment), only if neither preference set intersects the price line. If the indifference curves are smooth, then an interior Walrasian equilibrium implies tangency."

   (1) Tangency is not sufficient

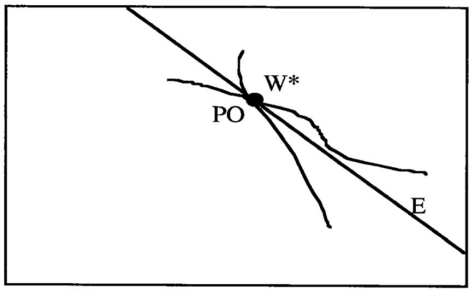
   Figure 5.2

   Even with smooth preference sets, tangency is not sufficient for a W.E. as can be seen in the figure above. Here person 1's indifference curves are sufficiently non-convex that person 1's maximal utility given the budget line is B rather than the tangency point A. That is, 1's preference set intersects the price line, and a W.E. does not exist. In simple terms: tangency but no separating hyperplane. Therefore, no W.E. but P.O.

   (2) Convexity of ICs is not necessary

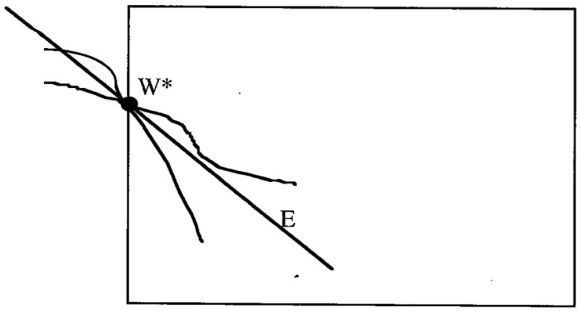
   Figure 5.3

   Even though the IC is not convex, we have a separating hyperplane. Therefore, there exists a W.E.

   (3) Tangency is not necessary

Figure 5.3B



The figure above displays a W.E. that is not interior but on the boundary. When the intersection takes outside the box, the person does not have enough of the one good to trade-off for the other good; the trade is not feasible.

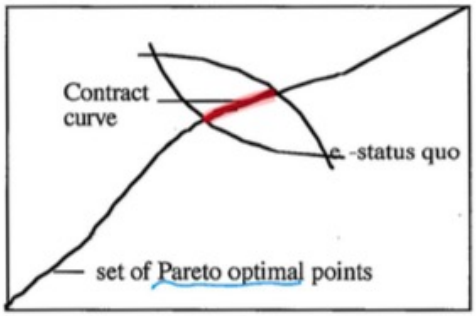
2. Pareto Optimality

   One person cannot be made better off w/o making the other person worse off. Essentially this says that a point x^*, y^* is **Pareto optimal** if the preference sets $R^1(x_1^*, y_1^*)$ and $R^2(x_2^*, y_2^*)$ do not intersect in the Edgeworth-Bowley box. Player 1 cannot be on a higher indifference curve unless player 2 is on a lower indifference curve.

3. Contract Curve

   The contract curve is the set of P.O. points within the subset of points Pareto superior to the status quo.

Figure 5.7



4. Arrow-Debreu

   Proposition

   Assume that there exists a market for every contingent commodity before the resolution of uncertainty. Assume also the following assumptions hold, then a W.E. exists.

   (1) Individuals are not risk-preferring. (i.e., they have convex preferences)

   (2) Firms are active in all the contingent claims markets so that they are risk neutral

   (3) U^i, i's utility fn., is independent of s, but not its arguments.

5. The I consumer J firm model

   [Def.] given a private ownership economy specified by $\{R_i, Y_j, e_i, s_i\}$, an allocation x^*, y^* and a price vector $p = (p_1, p_2, \ldots, p_k)$ constitute a W.E. if

   (1) For every j, y_j^* maximizes profits in Y_j; i.e., $py_j \leq py_j^*$ for all $y_j \in Y_j$

   (2) For every i, x_i^* is maximal for R_i in the budget set; i.e., $x_i^* \succsim x_i$ for all x_i s.t. $px_i \leq pe_i + \sum_j s_{ij} py_j^*$

   (3) $\sum_i x_{ik}^* \leq \sum_j y_{jk}^* + \sum_i e_{ik}$ for all k

6. Prop. Grossman and Stiglitz

   When information regarding probabilities is costly to obtain and only equilibrium prices prevail, no one will get information.

7. How to mitigate agency Cost?

   Agency cost arises because management has information that stockholders do not and management is empowered to make decisions on behalf of stockholders. Agency costs are mitigated by aligning the interests of the agent with the interests of the principal.

   (1) **Legal rules** impose fiduciary duties that require managers to act in the best interest of the stockholders. However, judges are incapable of making judgments on subtle failure to maximize profits (e.g. excessive diversification of the product line).

   (2) Some firms **tie salary incentive to the performance of the company**. E.g., stock option plans.

   (3) **Competitive market for managers** rewards the better ones with new job opportunities and more pay and prestige.

   (4) If management and the board of directors are not maximizing shareholder value, stockholders can wage a **proxy fight**. However, this is difficult and falls prey to the free rider problem.

   (5) Alternative, an outsider can overcome the free rider problem by making a **tender offer** and buy a majority stake in the firm.

8. Why consumer-owned grocery stores (food co-ops) are so rare in the U.S.?

   The reason for the general lack of success of grocery co-ops is the absence of a well-functioning market for corporate control. The consumer interest is almost always very diffuse so that if makes little sense for individual consumers to exercise control over managers. The problem of diffuse interest would be compounded if a consumer cooperative tried to take advantage of economies of scale by servicing many cities. Furthermore, inefficient co-ops are not targets of opportunity by other firms. As a result, the firms are less efficient.

   (1) individual returns small

   (2) no unity of interest

   (3) no market for control

9. How to mitigate opportunism?

   Once specific investments are made by both parties, it become a quasi-bilateral monopoly situation, even though the preinvestment situation was characterized by perfect competition.

(1) Reputation.

(2) Reducing its specific investment.

(3) Allocating the cost of the specific investment onto the side that is prone to act opportunistically.

(4) A complicated long-term contract detailing the amount supplied and the prices paid.

(5) Sometimes, the legal system is poor venue for enforcing the terms of the contract. Under such circumstances, the residual rights to control may be rearranged. For example, the firms might vertically integrate. In this way, hierarchy is substituted for the market.

10. Human capital: why no stocks?

(1) No market for control

(2) Moral hazard

(3) Adverse selection

11. Why in general risk sharing cannot be 100%?

(1) **Moral hazard**. E.g., if my car is fully insured against theft, I will be less cautious about where I park it or whether I lock it. To counter moral hazard, co-payments, contingent payments based on behavior

(2) **Adverse selection**. Higher than average risks are more likely to buy insurance tending to make insurance unprofitable. To counter it, experience rating, background checks, etc.

(3) **Administrative costs**. Administrative costs of providing insurance are not zero.

(4) **Correlated risk**. (i.e., the Edgeworth-Bowley box is no longer square). If risk is correlated, then ability to insure completely is reduced. In the limit, there is no trade if people are identical and their risks are perfectly correlated. This is why there is no insurance against war, but there is insurance against fire even though the former has a lower probability of occurring within the US.