

PRELIMINARY EXAMINATION FOR THE Ph.D. DEGREE

Instructions. You should answer a total of 4 questions, including at least one question from each of the parts (A, B, and C).

Part A

1. Product Variety:

- (a) Using an additively separable utility function in the monopolistic competition model due to Krugman, prove that consumer welfare goes up as variety increases. Then illustrate graphically why opening trade increases product variety. Explain verbally how these results and graphs are modified in the CES case.
- (b) Consider an endogenous growth model in the CES case. Explain how increased input variety affects productivity. Then show analytically how country size affects the growth of input variety in an autarky model. Explain verbally whether this result continues to hold when we open trade, i.e. will a larger world necessarily have higher growth than the autarky growth rate in both countries?
- (c) Explain how we can measure product variety in practice, using the method due to Feenstra.

2. Trade Policy:

- (a) Explain why the price charged by a domestic monopoly will be higher under a quota than under a tariff, even when the tariff and quota have the same import level. Then analyze the impact of a quota when there is a duopoly, i.e. a domestic firm competing with a foreign firm. Explain how the impact of the quota depends on the form of market conduct.
- (b) Now consider the impact of an export subsidy when there is a duopoly, i.e. a domestic firm competing with a foreign firm for sales in a third market. For each type of market conduct, show graphically how the reaction curves are affected by the subsidy, and explain what happens to firm profits and national welfare in the exporting country.
- (c) Explain analytically how the empirical method due to Robert Hall can be used to measure the markups in an industry (and also measure productivity). What would you expect to find if you applied this method to the U.S. steel industry during periods when it had tariff protection, and during periods when it had quota protection?

Part B

3. Current Account theory

Consider a representative agent problem for a small open economy. The household receives an exogenous endowment of the single type of good (Y), usable for private consumption (C) or exogenous government consumption (G). It can save only in the form of a real riskless bond (B) paying a fixed return $r = \frac{1}{\beta} - 1$. Government consumption is fully financed by lump-sum taxes.

Assume the usual transversality and no Ponzi conditions. Here is the household problem:

$$\text{Max } E_t \sum_{s=t}^{\infty} \beta^{s-t} U(C_s)$$

$$\text{s.t. } B_{s+1} - B_s = Y_s + rB_s - C_s - G_s$$

$$\text{where } U(C_s) = C_s - \frac{1}{2}C_s^2 \quad 0 < C_s < 1$$

- a) Derive first order conditions for the household problem and solve for consumption and the current account as functions of current and future changes in the exogenous variables.
- b) What happens to **consumption** and the **current account** in the present period under the following scenarios? Give magnitudes and directions of changes.
 - (i) a temporary rise in government purchases by 1 unit this period only.
 - (ii) a permanent rise in output endowment by 1 unit beginning this period.
 - (iii) an expected permanent cut in government purchases by 1 unit beginning next period.
- c) Suppose now the interest rate, r , is exogenously time varying. Discuss the effect that a temporary fall in this interest rate this period (for payment on bonds next period) could have on the current account of this country, and what this effect depends upon. (Be as specific as you can, but no math required.)

4: International Risk Sharing

In 3-4 paragraphs, present a well-organized argument in favor or against the following proposition: "There are substantial gains in international risk sharing between households that have not been exploited due to imperfections in the international financial market." There are several ways of answering this question that would be satisfactory. Make use of references to relevant literature, both empirical and theoretical, in constructing your argument.

Part C

5. Cross-Border Mergers and Acquisitions

(a) Describe a basic Nocke-Yeaple (2007) framework with cross-border mergers and acquisitions (M&As) and greenfield FDI in an industry where only the “mobile” technology (m) is heterogeneous. (There is no need to assume a specific distribution.) In particular, list and explain the necessary equilibrium conditions that determine various cutoffs.

(b) Graph and describe verbally which firms are expected to sell out, which will engage in cross-border M&As, and which in greenfield FDI. Why do some firms exit by selling out on the merger market?

(c) Suppose that instead of having a completely mobile technology, marginal cost in a merged firm will be an average of the parent and target firm marginal costs:

$$m_{merged} = \left(\tilde{m}_{parent}^{\frac{1}{d}} \tilde{m}_{target}^{\frac{1-d}{d}} \right)^{1-\sigma},$$

with $0 < d < 1$. How would you expect the outcomes in the merger market to change (if at all) with regard to the price of a target firm and which firms choose to sell out? Show analytically why this would be the case.

6. Ricardian Models

Consider the two-country case presented in Dornbusch-Fischer-Samuelson (1977, hereafter DFS). Let x denote the fraction of goods that the home country will export to the foreign country in equilibrium. Note that this fraction in the Eaton and Kortum (2002, hereafter EK) framework, $x \equiv \pi_{fh}$ (DFS call this fraction z^*). Denote the ratio of unit costs for home exports and foreign domestic production, using EK's notation, as

$$A = A(x) = \frac{c_h d_{fh}}{c_f},$$

where c_i represents unit costs of production for a particular industry in country i and $d_{ki} > 1$ is the trade cost involved in shipping goods from country i to country k .

(a) Suppose that the unit costs are based on efficiency levels drawn from the Fréchet distribution used in EK. Write down the formula for this distribution. Using the formula for π_{fh} from the EK model and the definition of A given above, derive the relationship between x and A .

(b) What parameter governs the dispersion of productivity levels across industries? Given a particular unit cost ratio, $A(x)$, does an increase in firm dispersion increase or decrease home exports? Why?

(c) Explain the role of technological growth in the Ricardian framework. Does it increase or decrease gains from trade in the DFS and EK models? Does it matter for your answer whether countries are growing at the same rate, or whether the growth occurs through technology transfer from one country to another?

(d) How does the formula for x change if firms operate not in a DFS-style perfectly competitive market, but in the duopolistically competitive framework of Bernard, Eaton, Jensen, and Kortum (2003)? Are trade patterns affected at all by the change in market structure? Are prices? Why or why not?