

Midterm 1 – Answer Key

International Economics
Monterey Institute of International Studies
Fall Semester 2001
Dr. Robert M. McNab

1. Discussing comparative advantage (10 Points)

- a. How does the concept of comparative advantage relate to a nation's transformation schedule?

The concept of comparative advantage suggests that the immediate basis for trade stems from cost differences between nations, which are underlaid by their natural and acquired advantages. These cost differences reflect the differing opportunity costs in production across nations. Domestically, we can examine the opportunity cost of one good (two-good, two-nation environment) by observing the nation's transformation schedule, however, we cannot make any inferences about comparative advantage without observing the other nation's transformation schedule (or knowing their opportunity costs).

In other words, we can determine comparative advantage in a two-nation, two-good, constant-cost environment, by examining the slopes of the transformation schedules for each of the countries.

- b. Illustrate graphically how a nation's comparative advantage can shift due to changes in the shape of its transformation schedule.

To illustrate a change in comparative advantage, a nation must experience one of several conditions that shifts opportunity costs in production, that is, an increase/decrease in factor endowments, technology, etc. Shifting one nation's transformation schedule is not sufficient without assuming the other nation's transformation schedule and, hence, opportunity costs, are constant, or shifting at a slower rate.

In other words, one shifts the transformation schedule of one nation while holding the other nation's transformation schedule constant, thus changing the comparative cost advantage.

- c. Discuss, in your own words, the factors that can influence a nation's comparative advantage and how changes in those factors may change a nation's comparative advantage.

As noted above, an increase/decrease in factor endowments can shift a nation's comparative advantage. An increase/decrease in technology can have a similar affect.

For example, assume that Country A has a comparative advantage in the production of the a land-intensive good relative to Country B, which specializes in the production of the labor-intensive good. Country B acquires a significant amount of land, which increases the supply of land in Country B, which in turn lowers the price of land as a factor input in the Country B. As the price of land falls, the comparative advantage of B may shift from the production of the labor-intensive good to the land-intensive good since the opportunity cost of land relative to labor is falling and may fall below that of Country A.

2. Marginal Rate of Transformation and Marginal Rate of Substitution (25 Points)

- a. Define the Marginal Rate of Transformation and the Marginal Rate of Substitution, provide a numerical example of calculating the MRT and MRS in a two-good environment, and illustrate graphically the MRT and MRS in a constant-cost environment.

The Marginal Rate of Transformation can be thought of as the opportunity cost of one good in terms of another in production, or the amount of one production a nation must sacrifice to get one additional unit of another product. In the constant cost environment, the MRT is equal to the slope of the transformation schedule, while in the increasing cost environment the MRT is equal to the slope of the line tangent to the transformation schedule at the point of production.

A similar discussion should occur for the Marginal Rate of Substitution with the focus being on consumption not production as in the case of the MRT.

Examples provided in class and reading materials.

- b. Discuss, in your own words, how the MRT and MRS are used to find the autarkic and post-autarkic states. Illustrate graphically the transition from the autarkic to the post-autarkic state in an increasing cost environment characterized by two nations and two goods.

The student should note that the MRT and the MRS are equal in the autarkic and post-autarkic states when equilibrium is existant, that is, if MRT is not equal to MRS, then the economy is not in equilibrium.

Examples provided in class as to the autarkic and post-autarkic states.

- c. In your own words, discuss why the MRT and MRS are equal in the post-autarkic state.

More importantly, the student should observe that the MRT embodies the opportunity costs in production while the MRS embodies opportunity costs in consumption. Only when opportunity costs in production and consumption are equal will an equilibrium will occur, total utility is maximized, and production efficiency is at the highest possible level.

- d. What assumption in factor endowment theory suggests that the post-autarkic consumption point is the same for the two countries? Why is this assumption made in the factor endowment model?

Factor endowment theory suggests that preference conditions are homogenous across nations, that is, the nations share similar preferences for goods and services. By imposing homogenous preferences, we remove that factor from the analysis, and coupled with the assumptions on similar technology, we end up with a model that suggests that factor endowments drive comparative advantage.

3. Trade Equilibrium (15 Points)

- a. Discuss the concept of an offer curve and provide a two nation, two good graphical example of how offer curves can be used to find the trade equilibrium.

Offer curves present the export supply/import demand curves of countries. Illustrations provided in class and readings.

- b. Using your illustration in 3a, assume that the terms of trade are such that a disequilibrium exists in the export-import market for the two nations. Illustrate what is the affect of the disequilibrium terms of trade and how market forces adjust the terms of trade back to its equilibrium level.

Illustrations provided in class and readings.

- c. Using your illustrations in 3a and 3b, discuss and illustrate how technological or factor endowment changes may influence a nation's offer curve.

The student should note which country experiences the factor endowment/tech progress change (or which one has the largest magnitude change). The student should not only shift the offer curve of the country in question, but should also note that the terms of trade will shift due to the shift in factor endowments/technological capabilities of the country in question resulting in a new equilibrium.

Illustrations provided in class and readings.

4. Diminishing Returns and Trade Theory (25 Points)

- a. Discuss, in your own words, how the Laws of Diminishing Marginal Returns and Utility are related to indifference curves and transformation

schedules, respectively, and how these observations can result in a linkage between indifference curves and the law of demand and transformation schedules and the law of supply.

One should recall that the Law of Diminishing Marginal Utility, in essence, “drives” the concept of Indifference Curves and the Law of Demand. Recall, the LDMU states, in brief, the more you have (consume) of any good relative to all others, the less value (satisfaction) you place (derive) from purchasing (consuming) additional units of that good. In other words, all else being equal, past some point, additional units of consumption of a good lead to declines in marginal utility.

What does this imply? For indifference curves, the implication is that to hold utility constant, past some point as you shift consumption of one good to another, you must consume ever increasing amounts of the one good to which you are switching consumption to hold utility constant. As you shift consumption away from Good A to Good B, past some point, the Marginal Utility of Good A starts to increase (you are consuming less, thus you derive greater satisfaction from the last unit consumed) and the Marginal Utility of Good B starts to decrease (you are consuming more, thus you derive less satisfaction from the last unit consumed). LDMU implies that Indifference Curves are convex in shape.

Note what this says, as you consume more of any good, relative to all others, the less satisfaction you derive from additional units of the good. If you derive less satisfaction from additional units of consumption, you value on those additional units of consumption declines, that is, you are unwilling to pay the same price as the last unit consumed to consume the next unit. Thus, to induce additional consumption, price must decline, implying a inverse relationship between price and quantity demanded.

A similar discussion follows from the production point of view for LDMR and Law of Supply.

Note that earlier the student should have observed that equilibrium occurs when the opportunity costs in production and consumption are equal ($MRT = MRS$). This is the concluding point of this question.

- b. Discuss, in your own words, how diminishing marginal returns to production is related to factor endowments, which in turn influences a nation’s comparative advantage.

Consider a nation that has an abundance of labor relative to capital. In the pre-autarkic state, this means that the price of labor in this nation is lower than that in a capital-endowed country and the price of capital is higher than that of the capital endowed country.

The relative scarcity of capital implies that opportunity cost of capital is higher in this country relative to the capital abundant country. This implies that the labor-abundant country has a comparative advantage in the production of the labor-intensive good relative to the capital-intensive country.

Note: This does not imply an absolute advantage, merely that, relative to the capital abundant country, the relatively labor-abundant has comparative cost advantage in the production of the labor intensive good.

With respect to diminishing returns, the country will specialize in the labor-intensive good, even though partially (or fully) specializing in the production of the good will result in diminishing returns, that is, the cost (opportunity cost/price) will increase as resources as shifted to the production of the labor-intensive good. Note that this also implies that the cost/price of capital in the labor intensive country will fall. At equilibrium, we know that, according to factor endowment theory, that factor prices will equalize.

Note in the factor endowment model, MRS is the same for both countries due to the assumption of homogenous preference conditions, thus the primary focus (as noted in a previous question) is on the supply conditions that equalize post-trade opportunity costs in production and consumption.

5. Policy #1 (25 Points)

- a. Assume that you are assigned to a USAID mission in a developing country. The country is characterized by high tariffs on imported goods, an abundance of labor relative to its neighbors, and a relative lack of capital. Currently, the nation is concentrating on developing local alternatives to imported, capital-intensive goods and recently announced a new government program to develop an automobile industry and a computer industry.
- b. If these policies were put into place, would you expect prices on domestically produced capital-intensive goods to be higher or lower to prevailing world prices? Why?

One might expect the prices for capital-intensive goods to be higher as the price of capital (the primary input) is higher in this country and the nation appears to be producing the good in which it has a comparative disadvantage.

One might assume that the government, as part of its program, subsidizes the cost of the capital-intensive good, of course, this brings up the question of further distortions in the economy.

- c. What does factor endowment theory suggest would be the more appropriate course of action for the nation?

Factor endowment theory suggests that the nation should specialize in the production of labor-intensive goods.

- d. Would you suggest trade liberalization? If so, what advice would you offer the government on the problems and benefits associated with liberalization? If not, explain the costs and benefits of maintaining high tariffs and other barriers to imports.

Student dependent answer.