Exam – Econ 4415 – December 2021

Problem 1: Specific factor (25 %)

Consider a country, Norway, that produces two goods, wheat and fish. Wheat is produced with workers and tractors. Fish is produced with workers and fishing boats. Workers are mobile between the two industries while tractors are specific to the wheat industry and fishing boats are specific to the fish industry.

1.1)   Discuss how the relative goods prices determine the allocation of labour between the two industries and the functional distribution of income.

1.2)   Norway considers starting trading with Sweden. In Sweden the price of wheat is lower than in Norway while the price of fish is higher. How will trade affect incomes for farmers (owners of tractors), fishing boat owners and workers in Norway?

1.3)   Even if some groups will lose from trade, in principle trade may benefit all groups. Explain how.

Problem 2. The Heckscher-Ohlin model (25 %)

Assume that in the long run, farmers and fishing boat owners can invest in the industries they prefer. Therefore, in the long run, there are only two factors of production. These are labor and capital. Assume that Norway is well endowed with labor relative to Sweden. Also assume that the use of labor to capital is higher in fisheries than in wheat production.

Discuss effects of free trade between Norway and Sweden in the long run. You can presume that rents to capital and wages were equal in the two industries before Norway and Sweden started to trade. Short run effects of trade are described by the specific factor model. In the long run, trade also involves reallocation of capital between the two industries.

Problem 3. Trade theory (40 %)

Consider the table below. The table is table 1 in Bernard *et al.* (2007). The article is on the reading list. The table indicates which types of trade theories that explain various empirical regularities and predictions. You can focus on the first column ("Old trade theory"), the second column ("New" trade theory) and the fourth column (Heterogenous firms model).

Discuss in detail how these three classes of trade theories explain different facts about trade.

Table 1

Trade Theories and Their Ability to Explain Facts about Trade

Facts	"Old" trade theory	"New" trade theory	Integrated model	Heterogeneous firms model	"Integrated" heterogeneous firms model
	Ricardo (1817), Heckscher (1919), Ohlin (1933)	Krugman (1980)	Helpman and Krugman (1985)	Melitz (2003), Bernard et al. (2003)	Bernard, Redding, and Schott (2007)
Trade					
Interindustry trade	Yes	No	Yes	No	Yes
Intra-industry trade	No	Yes	Yes	Yes	Yes
Exporters and nonexporters within industries	No	No	No	Yes	Yes
Trade and productivity					
Exporters are more productive than nonexporters within industries	No	No	No	Yes	Yes
Trade liberalization raises industry productivity through reallocation	No	No	No	Yes	Yes
Trade and labor markets					
Net changes in employment across industries following trade liberalization	Yes	No	Yes	No	Yes
Simultaneous gross job creation and destruction within industries following trade liberalization	No	No	No	Yes	Yes
Trade liberalization affects relative factor rewards (income distribution)	Yes	No	Yes	No	Yes

Notes: Interindustry trade occurs when a country exports in one set of industries and imports in another set of industries; intra-industry trade occurs when there is two-way exporting and importing within the same industry.

Problem 4. CES utility function (10 %)

Presume that consumers have the following utility function:

$$U = \left(\sum_{i=1}^{n} c_i^{\theta} \right)^{\frac{1}{\theta}}$$

$$0 < \theta < 1$$

Here, c_i denotes consumption of good i. Consumers want to maximize their utility subject to the budget constraint:

$$Y = \sum_{i=1}^{n} p_i c_i$$

Derive the demand function. Include each step of the derivation in your answer.