

# EXAMINATION

Faculty: **School of Economics and Business**

Examination in: ECN230                      Microeconomics of International Economics  
*Course code*                                      *Course title*

Time for exam: 15.12.202X                      09.00 – 12.00 (3 hours)  
*Date*    *As from – to and duration of exam (hours)*

Course responsible: Roberto J. Garcia  
*Name*

**Examination aids:** Code A2. Any two-way English-other language dictionary is allow (except a dictionary of economic concepts). No calculator is necessary; no other examination aids are allowed.

The exam includes: 3 pages including this instruction page  
Number of pages, including attachments

## Instructions:

Please keep answers to Part 1 separate from answers to Parts 2 and 3, and answers to Part 2 separate from those to Part 3. Avoid unnecessary information as this will negatively affect the quality and value of your answer. Graphs are required only when specifically asked for, but you can use graphs whenever you think it helps your answer. Be sure to label graphs, be neat, make all assumptions explicit and explain.

**Examination format:** Campus-based written exam, letter grade, A-F; 100 points total

**Part 1:** (25 points) true, false, depends format, 5 statements, each worth 5 points.

A brief explanation is required (no more than three sentences) to explain why the statement is either true, false, or whether it depends. Defend your answer in all cases.

**Part 2:** (45 points) medium-length answer format, 3 questions, each worth 15 points.

Provide short answers to the questions or statements. You may use a graph in your answer but be sure to explain the graph if you choose to illustrate your point in that way. Each problem is divided into two sub-parts. If asked for a *list*, a few bullet points related to the concept(s) is what is required.

**Part 3:** (30 points) trade modelling scenario and detailed supporting answers.

The question involves modelling a specific policy situation and trade policy analysis. You are instructed to provide a graph(s). Be sure to provide an explanation and any supporting assumptions that clarify what you are demonstrating in the graphs.

**Part 1.** Explain whether each statement is true, false, or whether it depends. If depends is your answer, be sure to explain upon what it depends. (25 points)

1.1 Suppose a country's economy largely consists of export and import sectors where production occurs in different regionally concentrated areas within the country, and that world prices of its exports increase relative to its imports. The gains from specialization and trade within the country would likely exceed any economic costs of adjustment.

D/F. Focus on the regional concentration of production within the country. When factors are mobile, there should be more winners because there would be movement of factors from the import-competing sectors that lose out. If production is regionally concentrated, then the losses to the import sector and gains to the export sector will also be concentrated. The cost of adjustment must take factor mobility into account to assess the benefits from specialization and trade.

1.2 Trade theory suggests that wage rates should become more equal when trade is free and goods markets are competitive. However, even under these market conditions wages in the same sector can still vary between countries.

T. Trade theory does expect wage convergence even when factors are immobile across countries. However, other factors that affect wages (e.g., labor unions, domestic L regulations, technology, access to K) that have nothing to do with traded goods mkts. If factor mkts are not int'al (i.e., limited int'al mobility) then L productivity across countries can differ affecting wages. In addition, there could be gov't intervention and transactions costs that affect traded goods, which could affect wages of workers in those sectors. Differences in income should also affect wages as well.

1.3 That most internationally traded beef meat comes from Australia, Argentina or Brazil and most Champagne comes from France is more an indication of comparative advantage rather than economies of scale.

T. The production of beef and champagne has much to do with how the good is produced and the climatic conditions and land access for its production which is related to comparative advantage and less to do with economies of scale. Given the amount of land or other resource that is available, as more of the good is produced it is more likely that cost per unit increases rather than decreases. These are examples of factor endowments affecting comparative advantage. Could also argue that Champagne is limited to the region in France that bears the name. This would also suggest that the land is the source of the comparative advantage and not scale of production.

1.4 A large country might have greater incentives than a small country to use restrictive trade policies.

T. A large country restricting exports or imports can affect the world prices, creating a TOT advantage for itself at the expense of other countries. Strategically, it would do so only if could ensure that other countries could/would not retaliate creating a tit-for-tat trade war (unless the point was intended, for example, as a foreign policy statement). The ability to affect prices, obtain income transfers, or to control access to an important resource, input or good gives the large country strategic advantages that a small country cannot achieve.

1.5 Economic growth is likely to have both positive and negative effects on an economy; therefore, immiserizing growth (i.e., growth that makes a country worse off) is a likely outcome in practice.

F/D. For a large country, economic growth has two effects: a positive real effect (the ability to  $\uparrow Q$  from the existing stock of L,K) and a negative TOT effect ( $\uparrow Q \rightarrow \downarrow P$ ). Immiserizing growth would be the result of the TOT effect dominating the real effect whereby so much more of an exportable must be traded to get a unit of an importable good. It is theoretically possible but it is not likely to happen. Focus on what would cause TOT effect to be  $>$  real effect.

**Part 2.** Relate answers to concepts discussed in class and avoid unnecessary info. (45 pts)

2.1 The case for free trade rests on the argument that international price signals are better than signals under a closed economy. The case for policy intervention is usually based on the theory of the second best, which argues that in some situations world prices cannot send proper signals. Think about the case for and against free trade when answering the following:

2.1.1 List some situations in which the world price cannot send proper signals to the domestic market. (5 pts)

2.1.2 Use one of the situations on your list in 2.1.1 to explain how and why policy intervention can improve welfare. (10 pts)

The theory of the 1<sup>st</sup> best says:  $P_w = MC = SMC = MB = SMB$ . The problems raised by the theory of the 2<sup>nd</sup> best includes situations when this does not hold:

- Externality (positive or negative)
- Market failure in goods mkts or factor mkts
- Non-competitive mkt situations (large firm or large country trade policy)

Focus on the implication of the theory of the second best and a condition where the theory of the first best is violated. Depends what you argue.  $SMB \neq MB$  and/or  $SMC \neq MC$  and  $P_w \neq MC = MB$ .  $P_w$  does not serve as a proper signal and it results in either too much/little production/consumption and or too much/little export/import. If a firm was behaving non-competitively, then too little is supplied to the world market at too high a price (abuse of mkt power). Welfare analysis cannot measure public goods provision or consumption. An externality situation could mean there is too much production/export because the export sector is not required to pay for its pollution. A mkt failure situation could mean that there is too little ag prodn and too little public good is provided because  $[P_A]_w$  discourages  $Q_A$ .

2.2 The Heckscher-Ohlin-Samuelson (H-O-S) model assumes that factors, labor and capital, are immobile across countries, which nowadays does not hold. Nevertheless, the movement of factors remains controversial in both the country that exports the factor and the country receiving the factor. Consider the movement of physical capital (i.e., plant and equipment) between countries, referred to as foreign direct investment (FDI). Use the logic behind the H-O-S model to help in answering the following:

2.2.1 Suppose the FDI-receiving country has an abundance of labor. Explain what you think the expected effects of the FDI inflows into the receiving country might be. Choose any one of the theorems underlying the H-O-S model to discuss whether or not the theory is consistent with your expectations. (10 pts)

It was important to choose a theorem to discuss the effect of the K flow. Answer depends on which theorem was chosen and the sector the K is going. The FDI could be related to cheap wages and the K inflow can improve L prodvty bringing, in time, factors prices to converge (factor price equilization thm and Solper-Samuelson theorems). The increase in K stock shifts the PPC toward the sector that uses it intensively but can shift prodn even in

the ag sector to increase L prodvty. – different than what the Rybczynski theorem postulates. The factor mobility would affect the factor proportions theorem but because the K can be applied to both sectors it could strengthen the other advantages a net exporting country has as per the theorem.

2.2.2 For the capital-exporting country, what might be the implications for its trade? Think about the relation between trade and investment. (5 pts)

Depends on what is argued. Trade and investment can be complements or substitutes. Indicate what it could be. We are not told what goods the K-exporting country trades. If the K-exporting country also exports productive capacity, then the export of K and technical knowhow can make the other country a competitor (such as Norway setting up fish farming operations abroad) such that the K-exporting country loses foreign mkt(s). K exports are a substitute to the K-exporting country's trade. If the FDI results in increased trade in intermediate goods, then the K can be complementary to trade.

2.3 Intra-industry trade is the two-way trade of goods in a similar product sub-category. This represents a departure from the factor endowment explanation for specialization and trade patterns. Think about the potential drivers of intra-industry trade patterns when answering the following:

2.3.1 *List* some reasons why intra-industry trade might occur. Use the concepts in your list to explain the implications for specialization patterns. Be specific. (10 pts)

- EOS without EOScope
- Preference for product differentiation
- Ability to mkt based on qualitative differences in the product
- Int'l S chain management – breaking up of the supply chain

Increased competition in product markets, greater choice for consumers, costs advantages that reduce cost per unit over some volume of output (e.g., capacity of a factory) that allows production of a subset of a range of product subcategory (i.e., no economies of scope). Allows for a supply chain to be broken vertically or horizontally allowing trade in differentiated products and two-way trade in parts.

2.3.2 Compare products in two different product sub-categories. Explain why a good in one product sub-category might have a high degree of intra-industry trade while a good in another product sub-category might have less intra-industry trade. (5 pts).

One good has a limited ability to differentiate the good by producers or to convince consumers of the qualitative differences. More homogeneous good with many firms able to supply a like product. Little value in trying to further differentiate. Uses of the product does not have qualitative differences that matter for the user/end user. Examples: cheese is a product with considerable variation in taste/texture (high IIT) while perhaps flour might be more homogeneous (low IIT). Car parts could be high IIT while salmon (Pacific vs Atlantic) might have lower IIT.

**Part 3.** Answer the questions related to the trade situation illustrated below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

In January 2018, then US president Trump applied trade restrictions on a variety of China’s exports to the US, as well as on exports from other countries. Some countries responded with tariffs on US products, resulting in a “tit-for-tat” tariff war. The most serious tariff war was with China, where it applied 25% tariffs on US exports, including soybeans. In the left-hand chart below is a comparison of the export prices of three important soybean exporting countries from their respective export ports. In the right-hand chart is the share of soybean exports to China, before and after China applied tariffs on US soybeans. In 2017, China accounted for 60% of US soybean exports. Use the charts to help answer the following:



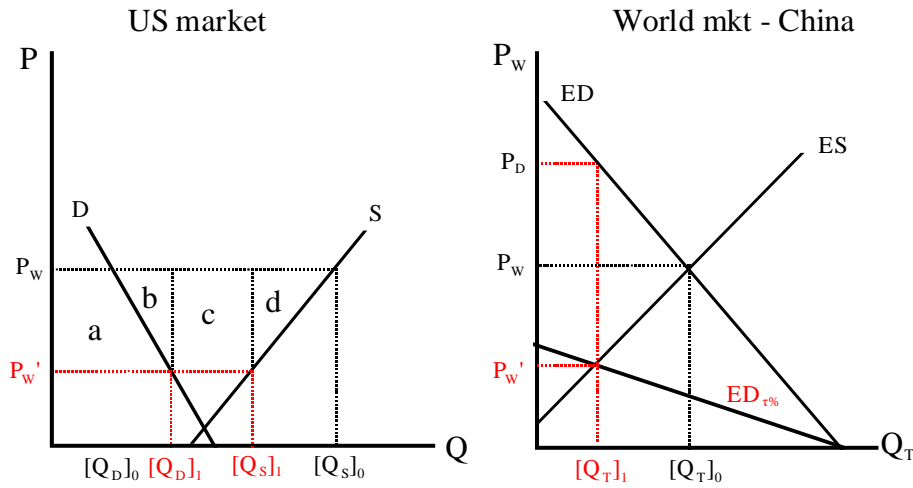
Source: *Economist*, “Soybeans: Soy sources”, 23 Feb 2019, p. 73.

3.1 In class we modelled trade in a two-country world. Think about whether the lessons of the simple model apply in this real-world context. Does it make sense for the export prices of soybeans from Argentina, Brazil, and the US to move so closely together before China applied a tariff? Explain. (5 pts)

Let the world market be as follows:  $ED_{WLD} = ED_{China} + ED_{ROW} = ES_{WLD} = ES_{US} + ES_{Arg+Bra}$ . Focus on the LOOP and why it seems to “hold” even in a many-country model. The LOOP provides that  $ES = ED$  should result in a  $P_W$  such that all mkts are in eqblm. The LOOP explains the patterns of soybean price movements very well. Prices move together based on world supply and demand conditional on the underlying conditions: competitive markets, identical goods, no transport/transactions costs, and no government intervention. Soybeans are a relatively homogeneous commodity, TC are a relatively small share of the price, and the world mkt is relatively competitive. Could have assumed that gov’t intervention was low prior to the 25% tariff. Soybean prices on the world market should converge, making the export price move together even at the different points of origin.

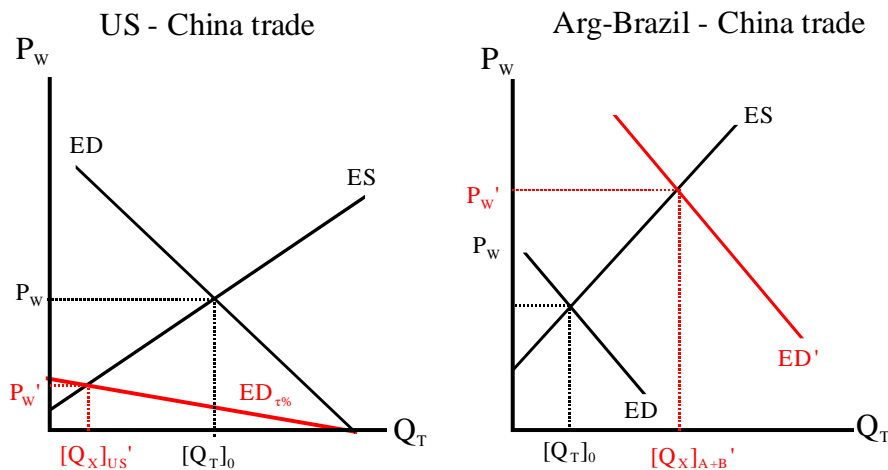
3.2 Provide a detailed model of an importing country that applies a 25% tariff in a two-country context. Carefully discuss how the trade implications of your simple model help to explain the situation (in early 2018) as presented in the charts above. (15 pts)

Show a two or three panel diagram of a large country ad valorem tariff of 25%. The decrease in the world price represents the decrease in the price for US soybeans (or at least the  $\downarrow P$  for US beans relative to Arg+Bra beans) and the decrease in the quantity traded is the reduction in US exports to China. The increase in  $P_D$  for China represents that there is less ES in the world available, reflecting the increase in Arg+Bra price of beans on the world mkt. Moreover, China reduces access to soybeans from the US market, its traditional supplier, and must shift to Arg+Bra beans explaining the divergence of prices from Brazil and Argentina from the US price.



3.3 Think about how you might separate the world total excess demand into China and the rest of the world (ROW), and world total excess supply as US, Brazilian and Argentine soybeans. Show/explain the trade patterns in the right-hand panel and why US prices move back in line with the prices of Argentine and Brazilian soybeans. Explain carefully. (10 pts)

In the graph in 3.2, the tariff reduces the price of the US good on the world market. Given that China is only applying a tariff on US soybeans, it is the US's problem to find new markets for its surplus soybeans. Once US exporters find the other markets or begin competing for those markets with Brazil and Argentina prices should again begin to converge. With US prices lower it should be relatively easy for US suppliers to compete with Arg+Bra beans in other mkts. Because the world mkt is basically unchanged (total ES and ED of the world), US prices will increase and converge with price of Arg+Bra beans. There is only a reallocation of beans. The Chinese market is supplied with beans from Brazil and Argentina and markets that Brazil and Argentina had supplied are now supplied by the US. The decrease in ED for US soybeans must be offset by increased ED for Argentine and especially Brazilian soybeans.



## ECN230 2022 retake exam

**Part 1.** Explain whether each statement is true, false, or whether it depends. If depends is your answer, be sure to explain upon what it depends. (25 points)

- 1.2 The argument for liberalizing trade can sometimes be disregarded by politicians because maximizing consumer welfare may not be a chief priority of the government.
- 1.2 The results of Leontief's findings on US trade patterns in the 1950s was a paradox (i.e., US imports were more capital intensive than US exports) because the US was technically efficient relative to the rest of the world given the abundance of US natural resources.
- 1.3 Suppose that as output increases firms experience a declining cost per unit. This implies that firms might get a bigger share of the domestic market, but it does not imply that the firm can exercise market power on the domestic market.
- 1.4 A rise in a country's terms of trade makes it better off because it is able to export at a higher price or import at lower prices.
- 1.5 Long-run comparative advantage explains why some nations use trade policies that promote import substitution industrialization.

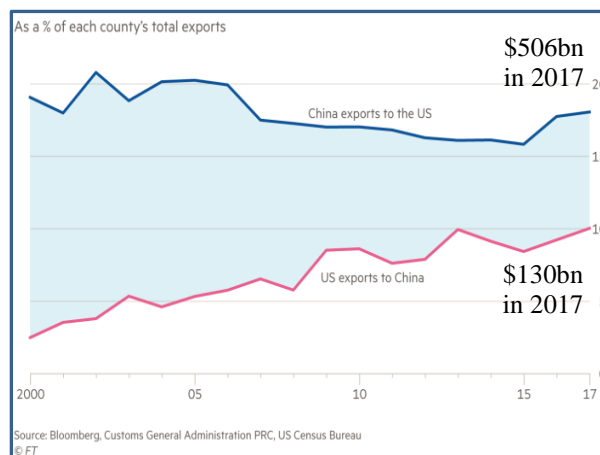
**Part 2.** Briefly answer the following questions or respond to the specific statements. Relate your answers to concepts discussed in class and avoid unnecessary information. (45 points)

- 2.1 In international economics, specialization and trade patterns are normally discussed in the context of comparative advantage, but the advantage is often presented or discussed as comparative costs. Think about how comparative advantage and comparative costs might differ and explain how it matters when defining the following trade-related concepts:
  - 2.1.1 Intra-industry trade. (7 pts)
  - 2.1.2 Factor mobility across countries. (8 pts)
- 2.2 The law of one price (LOOP) predicts that the price of goods will be the same across markets under specific conditions, i.e., when there is: (1) no transport or transactions costs; (2) no government intervention (i.e., trade policy); (3) identical goods; and (4) competitive markets. Think about the economic meaning of convergence as it relates to LOOP when considering the following:
  - 2.2.1 How is LOOP affected in situations where there is a fixed transportation cost or some form of trade policy? Explain carefully. (5 pts)
  - 2.2.2 How would you explain the LOOP in the context of trade involving similar goods (non-identical goods) or when markets are imperfectly competitive? Be specific. (10 pts)
- 2.3 Instability in international commodity markets can be a concern for the governments of net commodity exporting countries and net commodity importing countries alike. Think about a scenario where international commodity markets reflect greater scarcity, for some reason, when answering the following:
  - 2.3.1 It is argued that the nature of a commodity markets makes them different than final product markets. *List* relevant concepts covered in class that can explain why commodity markets might be unstable. (5 pts)

2.3.2 Use the list in 2.3.1 to describe whether the government of a net-importing country or a net-exporting country would be most likely to intervene to limit the effect of international market instability on the domestic market. Be specific [hint: could be useful to identify a specific commodity] (10 pts).

**Part 3.** Answer the questions related to the country-specific situation below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

Early in 2018, US president Trump fired the first shot in a trade war by raising tariffs across a variety of goods from friendly and rival countries alike. However, the biggest battle front in his trade war was with China because Mr. Trump was unhappy with US trade imbalances with China. In 2017, the US-China trade imbalance was both absolute and relative: China's value of exports to the US was \$506bn and the US's value of exports to China was \$130bn. China's exports to the US amounted to about 18% of its total export value, whereas the US exports to China amounted to only 10% of its total. [*Financial Times*, "Trump declares trade war on China", 9 May 2018, p. 9.]



3.1 The US president argued that a trade war with China would be easy to win under the scenario as presented above. How would you judge the validity of the argument? (5 pts)

3.2 For simplicity, suppose the US economy is based on two goods (an exported good and an imported good). To further simplify assume that the US is a small country. Compare the partial equilibrium economic, trade, and welfare effects of an import tariff by the US with the effects of an export tax by the US.

3.2.1 Provide a graph of only the US domestic market of the importable good showing the economic, trade and welfare effects from a tariff. (5 pts)

3.2.2 Provide a graph of only the US domestic market of the exportable good showing the economic, trade and welfare effects from an export tax. (5 pts)

3.2.3 From the partial equilibrium results in 3.2.1 and 3.2.2, could you argue that the general equilibrium effects of the import tariff are like an export tax? Would it strengthen or weaken the President's argument in 3.1? (5 points)

3.3 The US president argued that tariffs would just make the US richer than before because tariff revenue was flowing into the US Treasury (the ministry of finance). Considering your answer in 3.1 and your findings in 3.2, how would you judge the validity of the argument? Explain carefully (10 pts)



## Summary solutions ECN230 2022 retake exam

**Part 1.** Explain whether each statement is true, false, or whether it depends. (25 points)

1.1 The argument for liberalizing trade can sometimes be disregarded by politicians because maximizing consumer welfare may not be a chief priority of the government.

T. Trade need not always max SW or that of consumers. If  $P_w$  is not an efficient price signal, then it will not max SW. This could be the result of an externality or mkt failure. In the presence of either, trade can worsen consumer welfare.

1.2 The results of Leontief's findings on US trade patterns in the 1950s was a paradox (i.e., US imports were more capital intensive than US exports) because the US was technically efficient relative to the rest of the world given the abundance of US natural resources.

F. Leontief tested the factor proportion theorem by analyzing US trade patterns to see whether US exports were more K-int than its imports. The paradox was that US imports seemed to be K-int. The US being technically efficient relative to the world implied K abundance and relatively L scarce, would suggest that its exports would be K-int. When L was disaggregated into skilled and unskilled, it showed that US exports were skilled L-int relative to its imports. It was not due to an abundance of natural resources.

1.3 Suppose that as output increases firms experience a declining cost per unit. This implies that firms might get a bigger share of the domestic market, but it does not imply that the firm can exercise market power on the domestic market.

D. When as output increases cost per unit decreases implies EOS. EOS implies that the firm's size should increase, allowing it to capture a larger share of a market. The demand side of the market matters too though. Just because the tech allows a firm's size to increase, it is still possible for the domestic mkt to be competitive (perhaps not perfectly competitive), especially if the firm is subject to competition from similar products from foreign producers. Free trade can help insure greater competition.

1.4 A rise in a country's terms of trade makes it better off because it is able to export at a higher price or import at lower prices.

T. An improvement in the TOT means an increase in the purchasing power of the country. The value of exports increases and the value of imports decreases allowing the country to trade its goods at a higher price. This is especially true if TOT improves from an increased demand for a country's exports.

1.5 Long-run comparative advantage explains why some nations use trade policies that promote import substitution industrialization.

T. If gov't intervention can give space and time to domestic firms to learn by doing, then in time an infant industry can be promoted. ISI is a form of protection of domestic industry to allow those firms time to grow up and compete with established firms in more mature economies. Such intervention is argued to allow a country to develop a CA over the longer term.

**Part 2.** Relate answers to concepts discussed in class and avoid unnecessary info. (45 pts)

2.1 In international economics, specialization and trade patterns are normally discussed in the context of comparative advantage, but the advantage is often presented or discussed as

comparative costs. Think about how comparative advantage and comparative costs might differ and explain how it matters when defining the following trade-related concepts:

2.1.1 Intra-industry trade. (7 pts)

2.1.2 Factor mobility across countries. (8 pts)

Comparative advantage is typically a supply-side concept because it is based on the relative cost advantage a country has based on factor endowment, knowledge base, and other strategic factors.

2.1.1 Define IIT. IIT is not nec based on factor endowment because countries are engaged in 2-way trade of a similar good (differentiated good). Thus, factor endowment or knowledge base does not play as big a role. Satisfying consumer preference can be a more important factor affecting trade patterns.

2.1.2 Think about the implications of factor mobility. If factors are mobile, then factor endowment does not matter for specialization, production and trade patterns. Even if a good is intensive in a factor, the factor can be imported and the good produced where the factor is scarce. Factor price convergence is more likely and so relative cost factors do not matter as much, e.g., trade is no longer based on cheap wages because workers can move to where wages are higher. Again, trade can be based on satisfying differences in demand (preferences).

2.2 The law of one price (LOOP) predicts that the price of goods will be the same across markets under specific conditions, i.e., when there is: (1) no transport or transactions costs; (2) no government intervention (i.e., trade policy); (3) identical goods; and (4) competitive markets. Think about the economic meaning of convergence as it relates to LOOP when considering the following:

2.2.1 How is LOOP affected in situations where there is a fixed transportation cost or some form of trade policy? Explain carefully. (5 pts)

2.2.2 How would you explain the LOOP in the context of trade involving similar goods (non-identical goods) or when markets are imperfectly competitive? Be specific. (10 pts)

2.2.1 Recall exercise 1. A fixed transport cost would still result in convergence in prices across markets up to the margin of the TC, so LOOP still holds. A 10% tariff on imports (of an identical good) will likely mean, on average, that the border and domestic price will differ by about 10%, i.e., prices converge up to the margin of the tariff rate.

2.2.2 If the foreign good and the domestic good are similar but not identical, then preferences will determine the price differential. Suppose a foreign good is a luxury brand of a similar domestic good. Suppose preferences are such that domestic consumers are willing to pay a 15% premium for the foreign good. Then price convergence will occur up to the 15% premium, on average, because any more than that margin (a higher price of the foreign good) would result in domestic consumers switching to the domestic substitute.

2.3 Instability in international commodity markets can be a concern for the governments of net commodity exporting countries and net commodity importing countries alike. Think about a scenario where international commodity markets reflect greater scarcity, for some reason, when answering the following:

2.3.1 It is argued that that the nature of a commodity markets makes them different than final product markets. *List* relevant concepts covered in class that can explain why commodity markets might be unstable. (5 pts)

2.3.2 Use the list in 2.3.1 to describe whether the government of a net-importing country or a net-exporting country would be most likely to intervene to limit the effect of

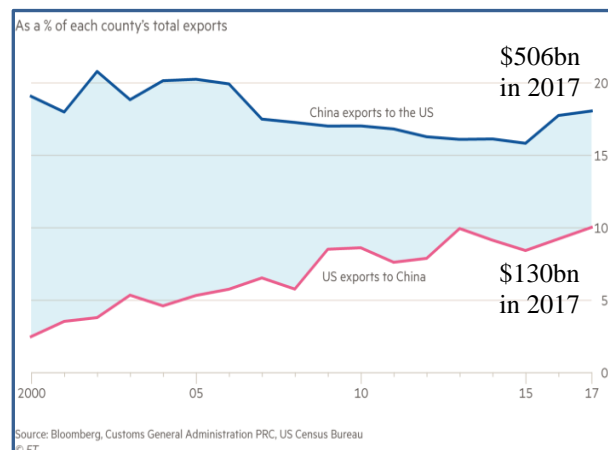
international market instability on the domestic market. Be specific [hint: could be useful to identify a specific commodity] (10 pts).

2.3.1 Give reasons for why S+D of a commodity are both relatively price inelastic for food/non-food uses. The more P-inelastic is S+D, the more unstable prices are given a change in S or D.

2.3.2 Suppose the commodity in question is an important grain such as wheat or rice that is a staple food. This can be the case in either or both the net exporting and net importing country. Consider a case where  $P_w \uparrow$  for some reason: war in Ukraine causes wheat P to increase. The Ukrainian gov't might choose to restrict exports to lower the domestic price of wheat for its consumers (even though it affects foreign consumers in importing countries). Consumers in a net importing country will likely ask its gov't for assistance to afford the staple good. In cases where net exporters restrict trade because  $P_w \uparrow$  the net importer might have to subsidize imports or subsidize domestic production. In so doing, the importer's gov't might pursue self-sufficiency to avoid being affected by the exporting countries.

**Part 3.** Answer the questions related to the country-specific situation below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

Early in 2018, US president Trump fired the first shot in a trade war by raising tariffs across a variety of goods from friendly and rival countries alike. However, the biggest battle front in his trade war was with China because Mr. Trump was unhappy with US trade imbalances with China. In 2017, the US-China trade imbalance was both absolute and relative: China's value of exports to the US was \$506bn and the US's value of exports to China was \$130bn. China's exports to the US amounted to about 18% of its total export value, whereas the US exports to China amounted to only 10% of its total. [*Financial Times*, "Trump declares trade war on China", 9 May 2018, p. 9.]



3.1 The US president argued that a trade war with China would be easy to win under the scenario as presented above. How would you judge the validity of the argument? (5 pts)

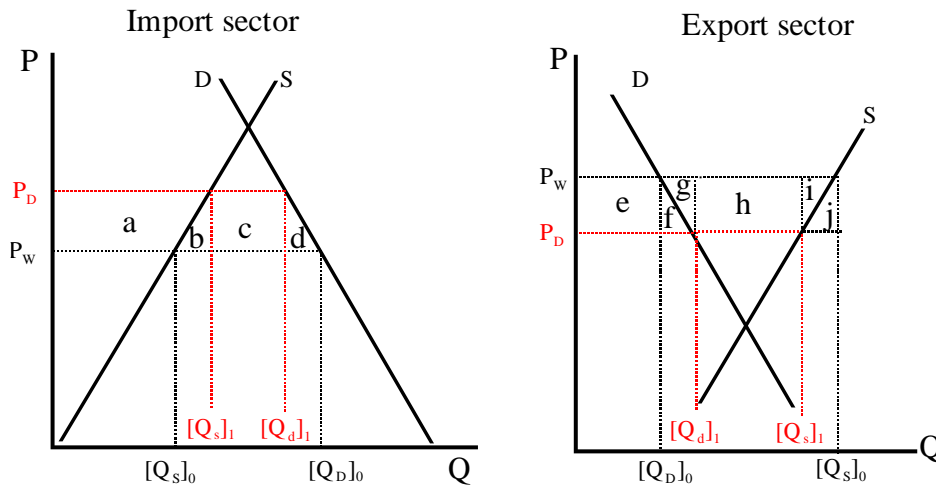
Think about the implications of trade. Free trade improves welfare (under the standard assumptions). Thus, restricting trade should reduce the welfare in both countries. The only way to interpret a win in a trade war is that the US would be worse off by less than China would be made worse off. The more dependent the two countries are to each other's economy the more pain there will be to share between them. The idea is devoid of an understanding of trade theory.

3.2 For simplicity, suppose the US economy is based on two goods (an exported good and an imported good). To further simplify assume that the US is a small country. Compare the partial equilibrium economic, trade, and welfare effects of an import tariff by the US with the effects of an export tax by the US.

3.2.1 Provide a graph of only the US domestic market of the importable good showing the economic, trade and welfare effects from a tariff. (5 pts)

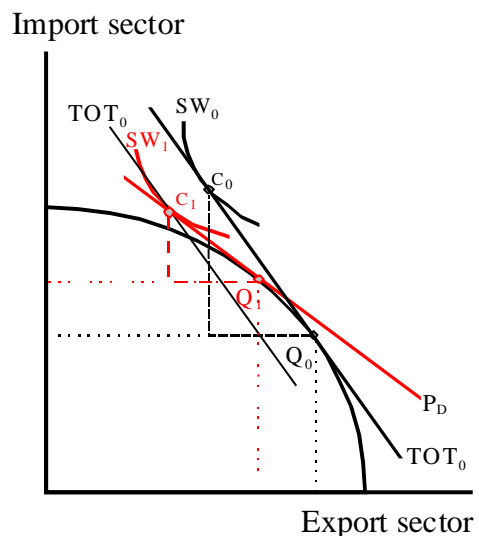
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3.2.3 From the partial equilibrium results in 3.2.1 and 3.2.2, could you argue that the general equilibrium effects of the import tariff are like an export tax? Would it strengthen or weaken the President's argument in 3.1? (5 points)



3.2.1 Welfare effects under a tariff		3.2.2 Welfare effects under an export tax	
$\Delta CS$	$-(a+b+c+d)$	Consumer tax	$\Delta CS$ $+(e+f)$
$\Delta PS$	$+(a)$	Producer support	$\Delta PS$ $-(e+f+g+h+i)$
$\Delta G$	$+(c)$	Gov't revenue	$\Delta G$ $+(h)$
$\Delta NSW$	$-(b+d)$	DWLs	$\Delta NSW$ $-(g+i)$

3.2.3 The import tariff increases the price of the importable relative to the exportable. The export tax decreases the price of the exportable relative to the importable. The change in the relative prices moves in the same way. If the two taxes were of say 10%, then the relative magnitude of the change would be about the same. This is Lerner symmetry. Thus, it would suggest that taxing imports is the same as taxing exports, which only serves to weaken the President's argument. The graph shows that the gen'al eqlbm results are the same.



3.3 The US president argued that tariffs would just make the US richer than before because tariff revenue was flowing into the US Treasury (the ministry of finance). Considering your answer in 3.1 and your findings in 3.2, how would you judge the validity of the argument? Explain carefully (10 pts)

First, the assumption here is that the US is a small country. So, under 3.1 the transfer to the gov't was paid for by consumers in the case of a tariff and, under 3.2, by producers in the case of an export tax. So, the US could not get richer under the small country context. The tax is simply redistribution in income from domestic economic actors to the gov't. In reality, the US is a large country, but restricting trade will reduce welfare and not make the US richer. If the US was able to improve its TOT and SW by taxing trade, then any attempt by China to retaliate would move both countries toward autarky in which case there would

be even less tax to collect from trade. The idea is devoid of any understanding of trade theory.

End of retake exam 2022\_\_\_\_\_

## Exam Dec 2022

**Part 1.** Explain whether each statement is true, false, or whether it depends. If depends is your answer, be sure to explain upon what it depends. (25 points)

- 1.3 Growth having a negative effect on the terms of trade is associated with a country that specializes and produces primary products rather than manufactured products.
- 1.2 David Ricardo and Adam Smith, two of the early contributors to the understanding of international trade, would have agreed that larger countries would receive most of the gains from trade when trading with smaller countries.
- 1.3 Domestic political pressure by consumer lobbying groups calling for a trade restriction would tend to argue in favor of a trade policy instrument that restricts exports.
- 1.4 In the long run, an advantage of an import tariff over an import quota is that the tariff is better at limiting market instability from the international market.
- 1.5 Increased foreign competition from trade liberalization would tend to place constraints on the wages of domestic workers.

**Part 2.** Briefly answer the following questions or respond to the specific statements. Relate your answers to concepts discussed in class and avoid unnecessary information. (45 points)

2.1 The standard textbook presentation of international trade usually involves a two-country situation. This must imply that the lessons learnt from analyzing the two-country context provides some valid insights for situations involving more than two countries. Think about the trade policy situations that were discussed in the lectures and in the exercise sessions when answering the following:

2.1.1 *List* the important economic, trade and welfare implications of an export subsidy in the two-country context. Structure your answer using a table as provided. [It is fine to landscape the answer sheet to accommodate the table on the page.] (9 pts)

	Economic implications	Trade implications	Welfare implications
Exporting country			
Importing country			
Brief explanation			

2.1.2 Considering your answer in 2.1.1, would it make a significant difference if there were more than two countries? In what way might it matter? Be specific. (6 points)

2.2 Globalization from an economic perspective involves international transactions related to trade in goods and services and the flow of factors (e.g., capital and labor) across borders. Industrialized countries have policies that limit the rate of immigration. Some developing countries have restrictions on foreign direct investment. Think about the implications of restricting the flows of on factors when answering the following:

2.2.1 In what ways might restrictions on the movement of foreign labor and capital be like restrictions on trade in goods? Explain. (10 pts)

2.2.2 Based on your answer in 2.2.1, *list* some arguments in favor of labor immigration? (5 pts)

2.3 The basic Heckscher-Ohlin-Samuelson (H-O-S) trade model emphasizes the importance of factor endowments as the determinant of specialization and international trade patterns for some goods. The presence of economies of scale (EOS) is a departure from the model's basic assumptions but it might help economic theory explain more current trends in globalization. Think about the implications of EOS when answering the following:

2.3.1 How do EOS change the basic H-O-S model? List some important differences for globalization that come about with the presence of EOS. (10 pts)

2.3.2 Considering your list in 2.3.1 would you agree or disagree with the comment that the law of one price still has relevance even with EOS? Explain. (5 pts)

**Part 3.** Answer the questions related to the country-specific situation below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

When Russia invaded Ukraine, the West and the European Union (EU) began considering a foreign policy response. One of the main areas to target was Russia's energy sector (oil and gas). Two alternative trade sanctions were proposed: a high tariff on Russian energy imports and a total ban (i.e., a complete restriction) on energy imports.

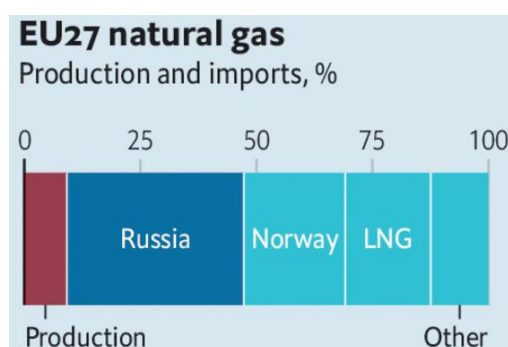
3.1 Weigh in on the debate over which would be a better approach by showing the effects of the two policy alternatives. Graph the trade implications in a two-country (i.e., EU-Russia) context. In your graphs and explanations, keep in mind the importance of energy to the economy.

3.1.1 Graph the world market situation of the effect of an EU tariff on Russian energy. Explain the change in equilibrium from a free trade situation. Be specific. (10 pts)

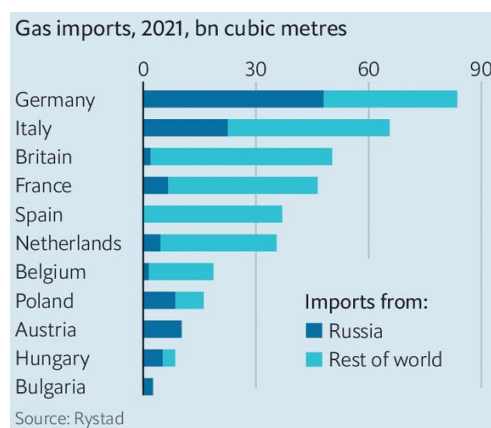
3.1.2 Graph and explain the world market situation of a ban on Russian energy. (5 pts)

3.2 Based on your results from 3.1 what would you say are the objectives of the tariff and the ban? Are they the same or different? Explain. (5 points)

3.3 Now, just consider the market for natural gas. The charts below provide information on the sources of natural gas in the EU and Russia's share of the EU market. While the EU can easily buy oil from alternative sources it cannot easily substitute gas suppliers because gas is supplied via pipelines (except for liquefied natural gas, LNG, which can also be shipped but would require additional construction of infrastructure). Russia cannot move its gas pipelines any more easily than the EU can find alternative gas suppliers. How might the decision to apply a tariff or a ban on gas differ from a tariff or ban on oil? Be specific. (10 pts)



*The Economist*, 30 Apr 2022.



Source: Rystad

**Part 1.** Explain whether each statement is true, false, or whether it depends. (25 points)

1.1 Growth having a negative effect on the terms of trade is associated with a country that specializes and produces primary products rather than manufactured products.

D/F. For a large country, growth has two effects: a real effect which is positive and a TOT effect which is negative. The real effect is positive because growth increases output, but and the TOT effect is negative because  $\uparrow Q \rightarrow \downarrow P_w$ . If a country is small, then the TOT effect is zero (because the  $\uparrow Q$  has no effect on  $P_w$ ). The negative effect of TOT will occur in a large country regardless of whether the growth occurs in the ag sector or manu sector. Do not confuse negative TOT effect with immiserizing growth.

1.2 David Ricardo and Adam Smith, two of the early contributors to the understanding of international trade, would have agreed that larger countries would receive most of the gains from trade when trading with smaller countries.

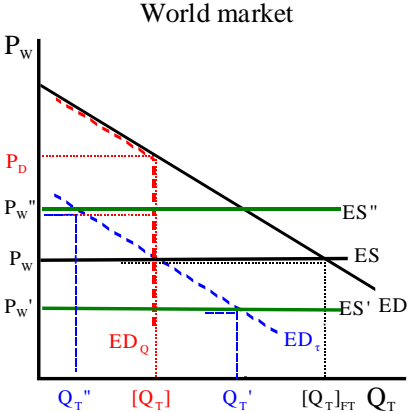
F. The assumptions of their argument and the basis for Ricardo’s model was that the international economy was more competitive than a closed domestic market situation. Thus, a large country would not or could not use/abuse its market power relative to the smaller country(ies). The larger country’s domestic prices would more closely reflect world prices. If so, then smaller countries would experience a bigger price change. Their price of exportables would be much higher and the price of their importables much lower. This would result in the bigger efficiency gains in production and consumption.

1.3 Domestic political pressure by consumer lobbying groups calling for a trade restriction would tend to argue in favor of a trade policy instrument that restricts exports.

T. Think about the objective of the policy. Domestic consumer lobbying groups would likely be interested in ensuring citizens’ access to certain products, staple foods for example, through lower domestic prices. An export restriction would lower the domestic price as more of the surplus would remain in the domestic market. Whenever there have been commodity price spikes, governments in net exporting countries have tended restrict exports.

1.4 In the long run, an advantage of an import tariff over an import quota is that the tariff is better at limiting market instability from the international market.

F. An import quota, if a binding constraint, will limit import volume by the same amount regardless of whether ES increases (ES’) or decreases (ES’'). If the domestic market is stable, then stable import volumes  $[Q_T]$  will ensure stable domestic prices at  $P_D$ . A tariff will, given  $\Delta ES$ , will still allow import volumes and domestic prices to change. Thus, international market instability can be “imported” into the domestic market.



1.5 Increased foreign competition from trade liberalization would tend to place constraints on the wages of domestic workers.



T/D. Trade liberalization will increase foreign competition. If the competitiveness of imported goods is based on low-wage labor, then increasing imports would mean that workers in the import-competing sector would either have to be more productive or see their wages decrease. More imports would likely mean loss of employment in those sectors and slower wage growth in these sectors over time. How much of a constraint there is no wages will depend on mobility and other factors affecting wages (skills, experience) and how L is used in export sectors (i.e., the demand for labor).

**Part 2.** Briefly answer the following questions or respond to the specific statements. (45 pts)

2.1 The standard textbook presentation of international trade usually involves a two-country situation. This must imply that the lessons learnt from analyzing the two-country context provides some valid insights for situations involving more than two countries. Think about the trade policy situations that were discussed in the lectures and in the exercise sessions when answering the following:

2.1.1 *List* the important economic, trade and welfare implications of an export subsidy in the two-country context. Structure your answer using a table as provided. (9 pts)

Economic implications	Trade implications	Welfare implications
Exporting country: <ul style="list-style-type: none"> <li>• <math>\uparrow P_D</math></li> <li>• <math>\uparrow Q_S</math></li> <li>• <math>\downarrow Q_D</math></li> </ul> Importing country: <ul style="list-style-type: none"> <li>• <math>\downarrow P_W \rightarrow \uparrow Q_D, \downarrow Q_S</math></li> </ul>	<ul style="list-style-type: none"> <li>• <math>\uparrow Q_X</math></li> <li>• <math>\downarrow P_W</math></li> </ul> <ul style="list-style-type: none"> <li>• <math>\uparrow Q_M</math></li> <li>• <math>\downarrow P_W</math></li> </ul>	Exporting country: <ul style="list-style-type: none"> <li>• <math>\Delta CS &lt; 0</math></li> <li>• <math>\Delta PS &gt; 0</math></li> <li>• <math>\Delta G &lt; 0</math></li> <li>• <math>\Delta NSW &lt; 0</math></li> </ul> Importing country <ul style="list-style-type: none"> <li>• <math>\Delta CS &gt; 0</math></li> <li>• <math>\Delta PS &lt; 0</math></li> <li>• <math>\Delta G = 0</math></li> <li>• <math>\Delta NSW &gt; 0</math></li> </ul>
$[P_D - P_W'] \cdot Q_X' =$ export subsidy which is the cost to the gov't	The decrease in $P_W$ reflects a worsening of the TOT from the exporter's perspective as they depreciate the value of the good they export.	The NSW effects are the DWLS in Q, C and international income transfers (from exporter to importer).

2.1.2 Considering your answer in 2.1.1, would it make a significant difference if there were more than two countries? In what way might it matter? Be specific. (6 points)

Yes, it could make a difference, especially in the way other countries are affected by the change in the world market, i.e.,  $\uparrow Q_X$  and  $\downarrow P_W$ . Other exporters would lose market share and export revenue. Some net importers might be satisfied with the income transfer while other net importers with import competing sectors would not be satisfied with the lower prices. However, the export subsidy could provoke retaliation from both importing country with a import-competing sectors.

2.2 Globalization from an economic perspective involves international transactions related to trade in goods and services and the flow of factors (e.g., capital and labor) across borders. Industrialized countries have policies that limit the rate of immigration. Some developing countries have restrictions on foreign direct investment. Think about the implications of restricting the flows of on factors when answering the following:

2.2.1 In what ways might restrictions on the movement of foreign labor and capital be like restrictions on trade in goods? Explain. (10 pts)

Make some assumptions about factor intensity in production. Give an example too. Basically, it is helpful to note that how factors can be substitutes for trade (also complements).

If a good is L-intensive in production, then a restriction on labor could be like a tariff on the import of a labor-intensive good. Consider a high-wage country that produces strawberries (but that is still a net importer) which tend to be picked by hand. Allowing foreign labor will lead to more production and lower prices at home. Restricting foreign L will increase the cost of production, reduce production and increase the domestic price of the fruit at home. An import restriction would also decrease the total supply of strawberries and increase the domestic price of the fruit.

Restricting FDI, foreign capital, will result in less domestic production and higher prices of goods that intensively use the K. Restricting imports of K-intensive goods will also raise the domestic price of the good and limit total supply.

2.2.2 Based on your answer in 2.2.1, *list* some arguments in favor of labor immigration? (5 pts)

Recall the reasons L might be motivated to move (apart from wages):

- Foreign L can increase dom prodn in sectors that require specific skills
- Foreign L creates jobs and economic activity in L-intensive sectors
- Foreign L contributes to taxes (as well as earn social benefits)
- Foreign L moves to work with immobile K.

An important point to make is that in globalization (TIG, TIS, L, K) the wage differentials between rich and poor is biggest for L. So, the biggest efficiency gain would be in allowing L migration.

2.3 The basic Heckscher-Ohlin-Samuelson (H-O-S) trade model emphasizes the importance of factor endowments as the determinant of specialization and international trade patterns for some goods. The presence of economies of scale (EOS) is a departure from the model's basic assumptions but it might help economic theory explain more current trends in globalization. Think about the implications of EOS when answering the following:

2.3.1 How do EOS change the basic H-O-S model? *List* some important differences for globalization that come about with the presence of EOS. (10 pts)

- Intra-industry trade
- Increased specialization within product sub-categories (e.g., types of cars)
- Increased market size, competition, and consumer choice
- Product differentiation and importance of the demand side
- Change in market structure and increase in firm size – oligopoly / monopolistic competition
- Importance of other market factors (advertising, marketing, product innovation and R&D, product design, relation to input suppliers or end users; supply chain, logistics, etc.)
- Decreasing AC and less importance of factor endowment or factor-specific requirements (other than tech knowhow and access to K)

2.3.2 Considering your list in 2.3.1 would you agree or disagree with the comment that the law of one price still has relevance even with EOS? Explain. (5 pts)

Agree. Even with intra-industry trade in like products that are differentiated, we would still expect prices to converge. Suppose the M1 and M2 are like products (two types of cars).

With intra-industry trade, M1 traded for M2, we would expect  $P_{M1}/P_{M2}$  to converge up to the premium that a consumer places on M1, for example. If the price of M1 increases relative to M2, then at some point consumers will shift to M2 even if their preference is for M1. In this way, there will still be an expectation for convergence (even if not total convergence) up to the premium for the preference.

**Part 3.** Answer the questions related to the country-specific situation below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

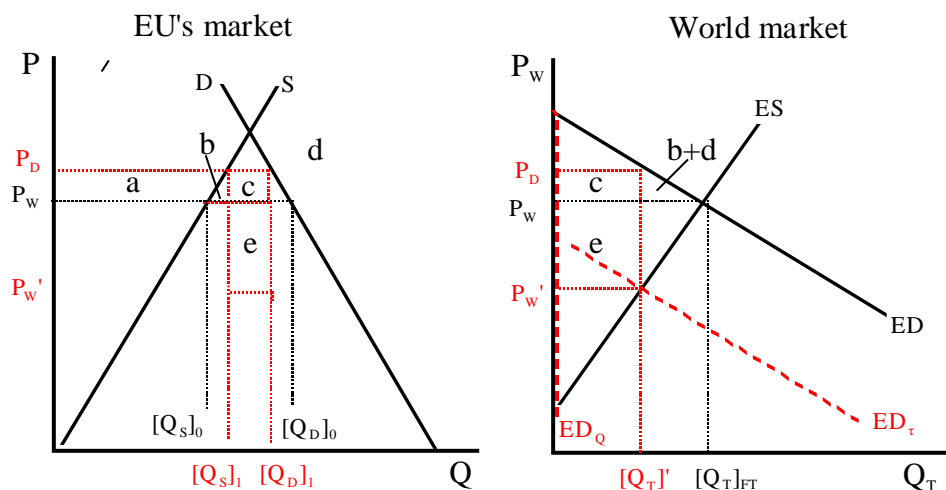
When Russia invaded Ukraine, the West and the European Union (EU) began considering a foreign policy response. One of the main areas to target was Russia's energy sector (oil and gas). Two alternative trade sanctions were proposed: a high tariff on Russian energy imports and a total ban (i.e., a complete restriction) on energy imports.

3.1 Weigh in on the debate over which would be a better approach by showing the effects of the two policy alternatives. Graph the trade implications in a two-country (i.e., EU-Russia) context. In your graphs and explanations, keep in mind the importance of energy to the economy.

3.1.1 Graph the world market situation of the effect of an EU tariff on Russian energy.

Explain the change in equilibrium from a free trade situation. Be specific. (10 pts)

3.1.2 Graph and explain the world market situation of a ban on Russian energy. (5 pts)



The graph shows the case of a large-country importer applying a specific tariff of the rate,  $[P_D - P_w'] = \tau$  which shifts the ED curve to  $ED_\tau$ . The tariff drives a wedge between the domestic and the world price. The EU's domestic price increases. The reduction in Russia's energy exports causes the world price to fall. In the EU, there are welfare transfers from consumers to domestic producers and to governments. There are also DWLs and an int'l income transfer 'e'. The net SW change depends on area 'e' relative to DWLs (b+d), but at least the EU would benefit by taxing Russia's energy exports.

As shown here, the tariff is intended to cause pain to Russia by pushing down the world price by more than the domestic price increases. The total revenue of the tariff is the sum of areas 'c' and 'e'. However, the pain is disproportionately applied on Russia as area 'e' is greater than area 'c' as shown.

The more difficulty Russia has in finding new markets for its energy, the more the world price will fall. If we consider other countries (China, India, etc.) can import from Russia (and are not part of the sanctions), the lower world price helps them but it could also mean

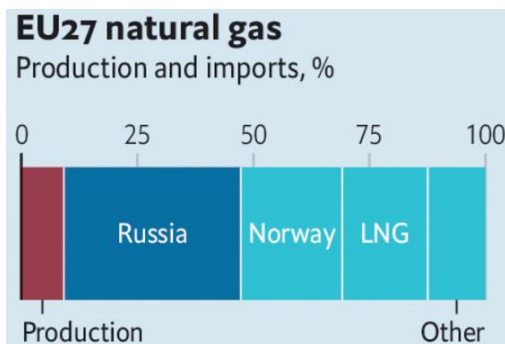
they slow the fall in the world price. What price they actually pay will depend on how much Russia will have to discount the price of its energy.

If instead a complete ban on Russian energy exports were applied, the ED would look like  $ED_Q$  where imports equal 0 (and it is assumed there is no smuggling). The domestic price of the EU would be the autarky price and the world price would fall to Russia's autarky price. This would inflict considerable pain on both sides without generating revenue. If a tariff were big enough to inflict a lot of pain on Russia, then Russia could simply refuse to export and would be the same as a complete ban.

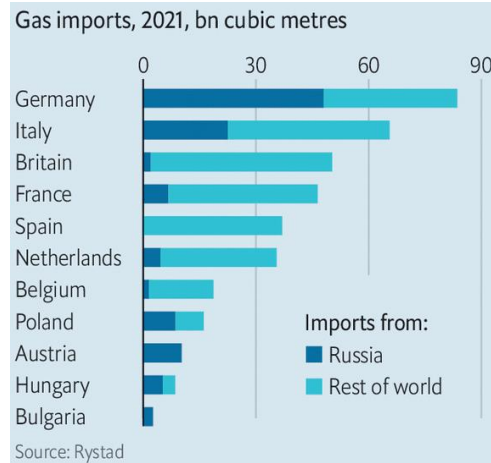
3.2 Based on your results from 3.1 what would you say are the objectives of the tariff and the ban? Are they the same or different? Explain. (5 points)

The general objectives are the same. The sanction is intended to punish Russia. However, while the policy should inflict pain on Russia, it should minimize the pain on the EU. The tariff not only hits Russia's exports but would provide revenue as a transfer from Russian energy. The domestic pain is offset somewhat by the fact that alternative supply can be sourced. A ban would inflict two-way pain especially where alternative sources are harder to obtain. Russia can sell energy to non-EU countries but would likely have to do so at a price cut.

3.3 Now, just consider the market for natural gas. The charts below provide information on the sources of natural gas in the EU and Russia's share of the EU market. While the EU can easily buy oil from alternative sources it cannot easily substitute gas suppliers because gas is supplied via pipelines (except for liquefied natural gas, LNG, which can also be shipped but would require additional construction of infrastructure). Russia cannot move its gas pipelines any more easily than the EU can find alternative gas suppliers. How might the decision to apply a tariff or a ban on gas differ from a tariff or ban on oil? Be specific. (10 pts)



*The Economist*, 30 Apr 2022.



Russia is the dominant source of natural gas to the EU. Given that domestic supply is through existing pipelines which cannot be changed in the short-run, the decision to sanction gas through either means is likely to be a two-way painful cut. Russia does not have alternative markets and the EU does not have alternative sources. The decision to apply a ban or tax on gas is more likely to look like a complete ban under 3.2. The decision to restrict oil imports is likely to be more along the lines of 3.1. To restrict gas is more of a challenge given Russia's share and the fact that different countries depend on Russian gas to a different degree.

NOTE: could have mentioned something about natural gas being more price inelastic and so a restriction on gas relative to overall energy would have bigger implications in terms of price changes.

## Exam 2021

**Part 1.** Explain whether each statement is true, false, or whether it depends. If depends is your answer, be sure to explain upon what it depends. (25 points)

- 1.1 Applying the logic behind the Heckscher-Ohlin-Samuelson (H-O-S) trade model, countries can equalize wage differences by either engaging in international trade in goods or by allowing skilled and unskilled labor to move more freely between the countries.
- 1.2 If an increasing share of the trade in goods and services is through intra-industry trade, then an increased efficiency of production and resource allocation should explain the gains from trade.
- 1.3 Countries that export a diversified selection of agricultural export products would not be at much risk of experiencing immiserizing growth.
- 1.4 If an import restriction can improve a country's terms of trade, and growth in the export sector can worsen its terms of trade, then a large country would be better off pursuing trade policies that favor import-competing industries over export industries.
- 1.5 If a country has import tariffs of 10% and domestic prices for those goods are higher than 10% of the border price, then this would suggest that the law of one price does not hold.

**Part 2.** Briefly answer the following questions or respond to the specific statements. Relate your answers to concepts discussed in class and avoid unnecessary information. (45 points)

- 2.1 Economists typically argue that tariffs are preferred to quotas and this thinking is reflected in the trade rules at the World Trade Organization. Think about the meaning of the equivalence (in terms of the economic, trade and welfare effects) of tariffs and quotas when answering the following:
  - 2.1.1 Explain how a tariff and a quota can have equivalent short-run effects. (10 pts)
  - 2.1.2 Despite the equivalence described in 2.1.1, provide a *list* that explains why economists still argue that a tariff is preferred to a quota. (5 pts)
- 2.2 Suppose you are studying two international manufacturing firms. One is diversified across a wide range of industrial product categories (e.g., manufacture of electronic goods, food products, automobiles, etc.) while the other focused along a single industry product category. Keep in mind how the interplay (i.e., the interaction) of a government's trade policy strategy, firm behavior and competition might have affected the operation of these firms domestically and internationally.
  - 2.2.1 Suppose the home government of each firm (the firms can be from the same country or from two different countries) implemented some industrial policy. What role might trade policy have played in the industrial strategy to explain how these firms are organized in their domestic market? Explain carefully. (10 pts)
  - 2.2.2 Could factor endowments in the Home country still explain the international trade behavior of these firms? Explain. (5 pts)
- 2.3 Globalization in an economic context is defined as international trade in goods and services and cross-border flows of labor and capital. Economic theory outlines the benefits and costs from international trade and cross-border factor flows. However, the theory is less precise on the nature of the relationship between trade and factor flows.

Keep in mind the benefits and costs associated with economic globalization when answering the following:

- 2.3.1 How might a country's welfare situation compare under two scenarios: (1) barriers to trade are relatively low but international factors are immobile; and (2) barriers to trade are relatively high but international factors are mobile? Be specific. (5 pts)
- 2.3.2 Explain how the international flow of a factor can substitute for international trade. Give an example of how this might happen. (10 pts)

**Part 3.** Answer the questions related to the country-specific situation below. Use concepts developed in the course to support your answer. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. (30 points)

Below are selected macroeconomic data (gross domestic product, GDP) and statistical data on trade of the sort presented in class lectures. Use the data to answer the questions related to the concepts and models discussed in class and in the readings. Note: you do not need to know anything about the Ethiopian economy just relate the information to the lecture material as best you can. Assume the country produces agricultural products and manufactured goods.

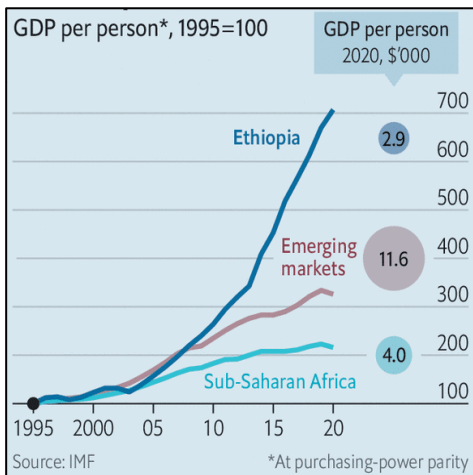


Table of selected statistical data for Ethiopia

	Trade as % GDP	Trade taxes as % of total revenue	Crop production index, 2014-16 = 100	Share of GDP by sector	
				Ag	Manu
2011	48	52	78	41	10
2012	45	47	82	44	9
2013	42	48	89	41	11
2014	41	47	96	39	13
2015	40	16	101	36	16
2016	35	17	102	34	22
2017	31	16	102	33	24
2018	31	21	102	31	27

Source: *Economist*, 20 Nov 2021; [www.statistica.com](http://www.statistica.com); [www.macrotrends.net](http://www.macrotrends.net); [Tradingeconomics.com](http://Tradingeconomics.com), accessed Nov 2021.

- 3.1 List relevant concepts presented and discussed in class that might be useful to explain the trends in the macroeconomic situation in Ethiopia. (5 pts)
- 3.2 In addition to the information presented, suppose that until 2000 the tariff rates on imported goods reached up to 50%. But by 2010, average tariffs on commodities (cotton, sugar, and other raw materials) ranged from 10-15%, while value-added products using commodities (e.g., textiles, clothing, drinks, etc.) had tariffs that ranged from 20-30%. What might have been the intention of trade policy? Explain in detail. (10 pts)
- 3.3 Consider the change in equilibrium occurring from 2011 to 2018 based on the given information. Provide a simple H-O-S type model of the agriculture and manufacturing sectors to show the changes in GDP and the other trends in the data (from an initial situation in 2011 to the situation in 2018). Keep in mind your list from 3.1 to ensure your model reflects those relevant concepts (but ignore the trade policy info in 3.2). You will have to make some assumptions. Assume whatever you want but list your assumptions. (15 pts)

**Part 1.** Explain whether each statement is true, false, or whether it depends. (25 points)

1.1 Applying the logic behind the Heckscher-Ohlin-Samuelson (H-O-S) trade model, countries can equalize wage differences by either engaging in international trade in goods or by allowing skilled and unskilled labor to move more freely between the countries.

T/D. The H-O-S model predicts equalization of wages (or convergence in the ratio of wages,  $[P_L]_{\text{skilled}}/[P_L]_{\text{unskilled}}$ ), across countries either through free trade in goods where a good that is skilled L-intensive in production is exchanged for a good intensive in the use of unskilled L. This is expected to happen even if L is immobile between countries. If both types of labor were able to move freely and if there is specialization in both the production of the unskilled L-intensive good and the skilled L-intensive good, then the price ratio should converge. This assumes that production is based on factor intensities.

1.2 If an increasing share of the trade in goods and services is through intra-industry trade, then an increased efficiency of production and resource allocation should explain the gains from trade.

T/D. Intra-industry trade is the exchange of goods along a sub-category of goods (e.g., one type of car exchange for a differentiated car). Intra-industry trade could be based on EOS whereby firms in countries specialize in the production of some set of a range of goods within a product sub-category, increasing efficiency in production and resource allocation but also the benefitting from the increased size of the world market and consumers preference for greater choice.

1.3 Countries that export a diversified selection of agricultural export products would not be at much risk of experiencing immiserizing growth.

T/D. Immiserizing growth is usually when a country specializing in agricultural goods is made worse off over time because the price of agricultural goods depreciates relative to manufactured goods on the world market (TOT effect > real effect). It is the case that a country dependent on a few agricultural exports might be more likely to suffer from immiserizing growth (a decrease in TOT relative to the country's imports). However, it is less likely that all agricultural commodities will suffer from a decrease in prices on the world market at the same time relative to the country's imports.

1.4 If an import restriction can improve a country's terms of trade, and growth in the export sector can worsen its terms of trade, then a large country would be better off pursuing policies that favor import-competing industries over export industries.

F. An import restriction might improve a country's TOT. Likewise, growth in the export sector might worsen the country's TOT. However, inward oriented economic activity from restrictive trade policy will not guarantee that the economy will be better off. Any improvement in SW from an import restriction is the result of the international income transfer, not from an efficiency gain from the economic activity. This would likely invite retaliation. Specialization and trade and the efficiency gains are argued to improve SW.

1.5 If a country has import tariffs of 10% and domestic prices for those goods are higher than 10% of the border price, then this would suggest that the law of one price does not hold.

F/D. The LOOP holds under specific conditions (competitive mkts, no gov't intervention, identical products, no transactions costs). But just because the conditions do not hold does not mean LOOP does not hold or have relevance. The gov't intervention here would

suggest that there should be a 10% price differential between the domestic price and the border price  $[P_D - P_W] = 10\%$ . Given that this is not the case any of the other conditions might also be affecting the P-differential. The expectation is that the difference would be equal to the margin of the transport cost, for example.

**Part 2.** Briefly answer the following questions or respond to the specific statements. (45 pts)

2.1 Economists typically argue that tariffs are preferred to quotas and this thinking is reflected in the trade rules at the World Trade Organization. Think about the meaning of the equivalence (in terms of the economic, trade and welfare effects) of tariffs and quotas when answering the following:

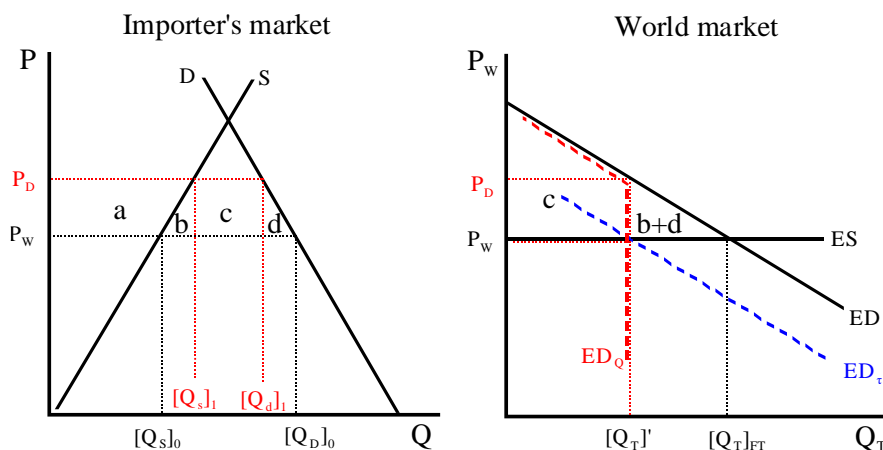
2.1.1 Explain how a tariff and a quota can have equivalent short-run effect. (10 pts)

The graph below models the effect of a tariff ( $ED_\tau$ ) and quota ( $ED_Q$ ) for the case of a small country.

Economic effects: Both raise the domestic price,  $P_D$ , which  $\rightarrow \uparrow Q_S$  and  $\downarrow Q_D$  and the same internal income redistribution effects (area a and c) and same DWLs (b+d).

Trade effects (small country): both leave  $P_W$  unaffected, but  $\downarrow Q_T$  to  $Q_T'$

Welfare effects: DWLs in production and consumption and same  $\Delta CS$ ,  $\Delta PS$ ,  $\Delta G$  (assuming the rents are captured by government) and  $\Delta NSW$



2.1.2 Despite the equivalence described in 2.1.1, provide a *list* that explains why economists still argue that a tariff is preferred to a quota. (5 pts)

- \* Quotas more likely to be negotiated with exporters
- \* Quotas require more political administration – need a licensing system to implement
- \* Rents motivate rent-seeking by firms, inviting non-competitive behavior
- \* Quota more directly affect private behavior (long-term consequences are more severe – distort trade more if the country has a comparative disadvantage into the future).

2.2 Suppose you are studying two international manufacturing firms. One is diversified across a wide range of industrial product categories (e.g., manufacture of electronic goods, food products, automobiles, etc.) while the other focused along a single industry product category. Keep in mind how the interplay (i.e., the interaction) of government strategy, firm behavior and competition might have affected the operation of these firms domestically and internationally.

2.2.1 Suppose each firm's home government (the firms can be from the same country or from two different countries) implemented some industrial policy. What role might trade policy have played in the industrial strategy to explain how these firms are organized domestically? Explain carefully. (10 pts)



Diversified firm	Specialized firm
Assumptions: Both firms are international. They are not small firms, have access to capital and are experienced in at least some export sector.	
<p>The industrial strategy could be related to development thru industrialization:</p> <ul style="list-style-type: none"> <li>* infant industry protection</li> <li>* import substitution industrialization</li> <li>* increase value added activity.</li> </ul> <p>This would be an example of a corporate conglomerate with production activities across various sectors. Trade policy could have been very restrictive to allow a “national champion” time to develop and employ a lot of labor. If the sectors were strategic, then gov’t could have facilitated access to credit and capital. The protection afforded the firm could give it profits which it could use as capital to start up activities in other sectors. Import protection could have given the firm near-monopoly power to earn profits and to diversify. Factor endowments are not likely an explanation for production patterns across a broad range of manufacturing for the firm to become a conglomerate. Production is not based on specialization or comparative advantage.</p>	<p>The industrial strategy could be related to specialization and vertical integration that gives the firm/sector a bigger advantage or opportunity to capture increased value added. Or it could be to help the firm fill a niche in the international market.</p> <p>The trade policy could have been some import protection or could have supported exports through subsidies or programs to facilitate exports until the firm learned how to market its product oi international markets.</p> <p>The firm specializes and takes advantage of comparative advantage in production based on factor endowments or tailoring its production to a niche market. The domestic market is likely more open and competitive relative to the diversified firm. If vertical integrated, then it could be that the strategic factors are relations with input suppliers, or ability to adjust to changing market conditions.</p>

2.2.2 Could factor endowments in the Home country still explain the international trade behavior of these firms? Explain. (5 pts)

The specialized firm could still behave according to H-O-S factor endowments. The availability of raw material at home could still be a cost advantage, but it could be that there are EOS in production with trade based on product differentiation and the importance of demand-side differences. For the conglomerate, it is unlikely that factor endowments are the main source of cost advantage.

2.3 Globalization in an economic context is defined as international trade in goods and services and cross-border flows of labor and capital. Economic theory outlines the benefits and costs from international trade and cross-border factor flows. However, the theory is less precise on the nature of the relationship between trade and factor flows. Keep in mind the benefits and costs associated with economic globalization when answering the following:

2.3.1 How might a country’s welfare situation compare under two scenarios: (1) barriers to trade are relatively low but international factors are immobile; and (2) barriers to trade are relatively high but international factors are mobile? Be specific. (5 pts)

If barriers to trade are low, then trade in A for M implies that  $P_A/P_M$  should converge across countries. In so doing, factor prices should converge,  $P_L/P_K$ . If production is based on factor endowment and intensity, then the returns to the abundant should increase.

If barriers to trade are high but factors are mobile, then movement of L and K implies that  $P_L/P_K$  should converge. L, K will move to where returns are highest. Instead of trade in goods, there would be trade in factors. In doing so, output prices of goods should converge, i.e.,  $P_A/P_M$ .

2.3.2 Explain how the international flow of a factor can substitute for international trade. Give an example of how this might happen. (10 pts)

Suppose North is abundant in capital and scarce in labor. There are two goods, A and M, where A is L-intensive and M is K-intensive. Before any cross-border factor movement takes place North exports M and imports A.

International flow of factors can substitute through international trade in the following manner. If K moves from North to South, the South can begin producing M, decreasing its reliance on trade A for M. If L moves across borders (from South to North), then production of the L-intensive good  $\uparrow$  in North and there is less trade in A-good.

**Part 3.** Answer the questions related to the country-specific situation below. (30 points)

Below are selected macroeconomic data (gross domestic product, GDP) and statistical data on trade of the sort presented in class lectures. Use the data to answer the questions related to the concepts and models discussed in class and in the readings. Note: you do not need to know anything about the Ethiopian economy just relate the information to the lecture material as best you can. Assume the country produces agricultural products and manufactured goods.

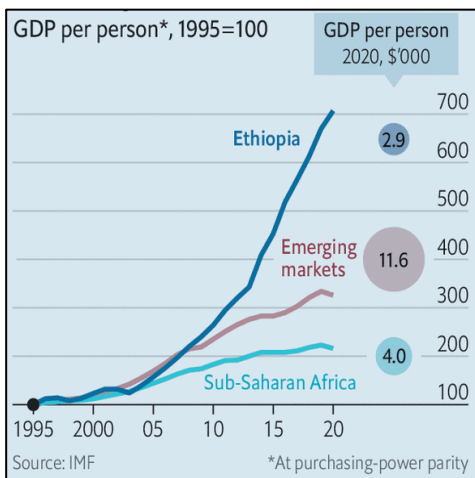


Table of selected statistical data for Ethiopia

	Trade as % GDP	Trade taxes as % of total revenue	Crop production index, 2014-16 = 100	Share of GDP by sector	
				Ag	Manu
2011	48	52	78	41	10
2012	45	47	82	44	9
2013	42	48	89	41	11
2014	41	47	96	39	13
2015	40	16	101	36	16
2016	35	17	102	34	22
2017	31	16	102	33	24
2018	31	21	102	31	27

Source: *Economist*, 20 Nov 2021; www.statistica.com; www.macrotrends.net; Tradingeconomics.com, accessed Nov 2021.

3.1 List relevant concepts presented and discussed in class that might be useful to explain the trends in the macroeconomic situation in Ethiopia. (5 pts)

- \* Trade policy
- \* Import substitution industrialization (infant industry)
- \* Specialization
- \* Economic growth ( $\uparrow$  prodvty or int'al L, K mobility)
- \* Anti-trade growth in production
- \* Trade reliance/dependence
- \* Increased purchasing power (SW)

3.2 In addition to the information presented, suppose that until 2000 the tariff rates on imported goods reached up to 50%. But by 2010, average tariffs on commodities (cotton, sugar, and other raw materials) ranged from 10-15%, while value-added products using

commodities (e.g., textiles, clothing, drinks, etc.) had tariffs that ranged from 20-30%. What might have been the intention of trade policy? Explain in detail. (10 pts)

Up to 2000, trade policy may have been intended to offer protection and support to specific sectors. The increased liberalization of the economy (i.e., lowering tariffs, on average) may have increased competition and efficiency or was the result of developing infant industries or pursuing import substitution industrialization.

Tariff escalation is a feature of the trade policy after 2010. Lower tariffs were applied on raw materials even though they may have competed with locally produced raw materials. The intent may have been to make more raw material available for local manufacturing which had higher protection. The higher rates on manufactured goods could be to give space to local producers until they could compete on either the domestic or international market without the need for protection. This is the infant industry argument. This could support inward oriented ISI or serve to develop a sector aimed at developing diversified exports.

Given the ↓ trade as % of GDP, the policy seems to point in the direction of less trade dependence and toward import substitution. The increase ag prodvty means that more resources could move to the manufacturing sector without decreasing absolute levels of ag production.

Increase prodvty could explain the increase GDP per person and fast growth (though from a small base in 1995). The fastest growth period is after 2010.

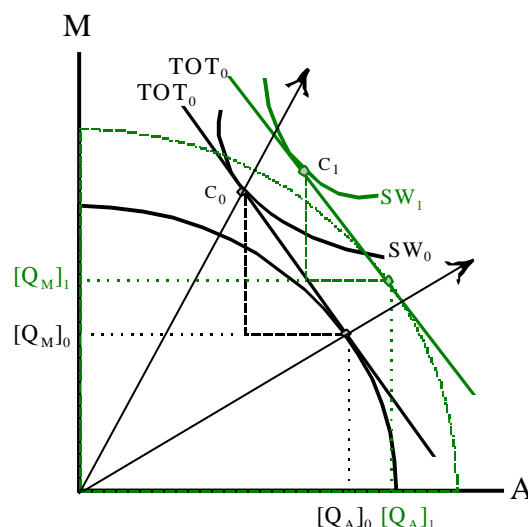
Taxes from trade decrease with liberalization. If tax revenue helped to finance the support for industrialization, then the decrease in the share of total revenue could suggest a switch toward capital mkt liberalization (FDI to facilitate K to the manu sector).

3.3 Consider the change in equilibrium occurring from 2011 to 2018 based on the given information. Provide a simple H-O-S type model of the agriculture and manufacturing sectors to show the changes in GDP and the other trends in the data (from an initial situation in 2011 to the situation in 2018). Keep in mind your list from 3.1 to ensure your model reflects those relevant concepts (but ignore the trade policy info in 3.2). You will have to make some assumptions. Assume whatever you want but list your assumptions. (15 pts)

Assumptions: small country case of growth; sector-specific growth toward manufacturing; anti-trade growth in Q; no info on C patterns but ↓ trade dependence (trade ↓ as share of GDP)

Implications for model:

Growth: PPC skewed toward M-sector maybe from copying existing technology but also ↑A prodvty  
 No change in TOT with growth – small country  
 Smaller trade triangle reflects ↓ trade as % GDP  
 Anti-trade growth in production and consumption to reflect ↓ trade as % of GDP  
 ↑ $Q_A$  in absolute terms, but ↓ as % GDP; ↑ $Q_M$  in absolute and relative terms (%GDP)



## Exam 2020 [Covid-year take home exam!!]

**Part 1.** Explain whether each statement is true, false, or whether it depends. If depends is your answer, be sure to explain upon what it depends. (25 points)

- 1.1 Consider the effect on farmland values in a net importing agricultural country that protects the sector. The changes in farmland prices that would result from liberalization of agricultural trade would be evidence in support of the factor-price equalization theorem.
- 1.2 When the poorest of developing countries can achieve productivity gains, they can become both richer and cheaper.
- 1.3 Deindustrialization from Dutch disease (where production of a natural resource competes with manufacturing) is inconsistent with what is predicted by the Rybczynski theorem.
- 1.4 Sector-specific technological change is more likely to cause trade dependency in a country because growth would be accompanied by pro-trade production and consumption effects.
- 1.5 The Heckscher-Ohlin-Samuelson (HOS) model of trade would predict that most research and development activity is done in the industrialized countries.

**Part 2.** Briefly answer the following questions or respond to the specific statements. Relate your answers to concepts discussed in class and avoid unnecessary information. (45 points)

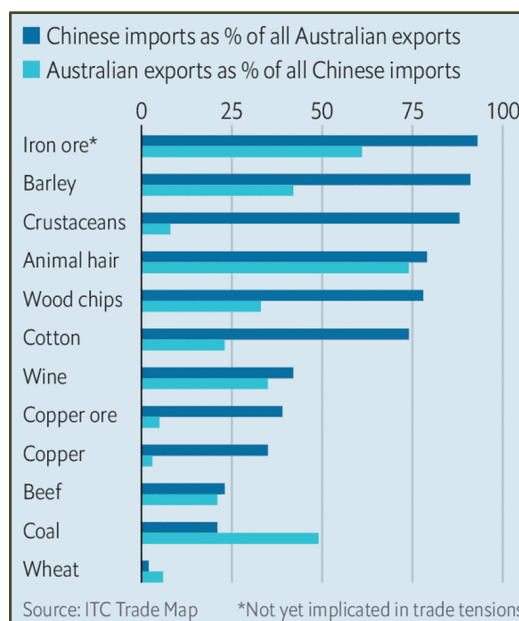
- 2.1 Suppose you are an advisor to the ministry of trade of a country whose main exports are commodities and main imports are manufactured goods. Your responsibilities include to advise the minister and to produce an economic report with recommendations.
  - 2.1.1 The minister is concerned with whether the terms of trade move unfavorably against commodity exporters in the long run. Explain to the minister why you think this proposition is correct or incorrect. (5 pts)
  - 2.1.2 The report is on the forces that are likely to drive the country's terms of trade in the next two decades and the potential for faster growth. *List* the main points of the report and briefly explain each [make your assumptions clear]. (10 pts)
- 2.2 The two questions below address separate situations that are *not* related.
  - 2.2.1 Suppose that in one country (Home) the ratio of land to labor used in production of livestock (cattle, sheep, etc.) is higher than that for production of crops (oats, wheat, etc.). In a more crowded country (Foreign), where land is more expensive and labor cheap, it is common to raise animals using less land and more labor than Home's crop production. What might this scenario say about factor intensity in production of livestock and crops? (7 pts)
  - 2.2.2 Consider foreign direct investment by a multinational corporation. How might the motivations for the firm's internationalization strategy (i.e., investing abroad) be different if the firm's strategy involves horizontal integration versus vertical integration? Explain. (8 pts)
- 2.3 The basic HOS trade modelling framework assumes that comparative advantage is based on factor endowment differences under perfectly competitive markets. Other restrictive assumptions underpinning the framework help explain these trade patterns. Consider a situation where a country has an industry cluster (a regional concentration of related productive activities). Think about how an industry cluster might form and exist within a

country and how this might be a deviation from the HOS model when answering the following:

- 2.3.1 List some strategic factors that could explain the development of an industry cluster within a country. (5 pts)
- 2.3.2 Using the list of strategic factors in 2.3.1, explain how the advantages could be lost in the longer term. Develop a story that might explain the breakup of the country's industry cluster. [Hint: provide a specific example.] (10 pts)

**Part 3.** Answer the questions related to the scenario described in the paragraph below. Be specific and explain your answers to the best of your ability. Label graph(s) clearly and explain them. Use concepts you think will support your answer. (30 points)

China's foreign policy increasingly uses trade sanctions (i.e., some form of penalty affecting trade) on countries with which it has foreign policy disagreements. In 2020, China had a series of foreign policy clashes related to Australia's (1) call for an inquiry into the origins of Covid-19; (2) rejection of China's claims in the South China Sea; and (3) role in holding joint naval exercises with the US, Japan and India. China's sanctions against Australia came in the form of trade policy (e.g., restrictions on imports of barley, beef, lobsters, and wine), or indirect restrictions from the authorities discouraging Chinese firms buying Australian goods (e.g., coal, cotton, and timber products). The chart presents selected China-Australia trade statistics for 2019.



- 3.1 List some concepts discussed in class that relate to the data in the chart. Use the list to explain what the data might say about the effectiveness of China's sanctions? (10 pts)
- 3.2 Choose one of the products listed in the chart (other than iron ore) to model the implications of China's trade restriction on Australia (in a two-country world context). Graph a two-panel diagram (only model China's domestic market and the world market but do not include Australia's market). Use the model to support your answer to 3.1. Explain and be specific. (15 pts)
- 3.3 The footnote in the chart notes that iron ore is "not yet implicated in trade tensions" (i.e., it has not been targeted by sanctions). What might explain this? [Hint: Make whatever assumptions you want in order to tell a story.] Would a trade policy restriction have a different effect than an indirect restriction where authorities "discourage" firms from buying Australian iron ore? Explain and be specific. (5 points)

**Confirmation statement:**

I confirm that I have not consulted or taken contact with my classmates during the period of the exam.

To confirm enter exam number in box  or student ID number: \_\_\_\_\_



**Solutions 2020: N=19**

**Results: A=3; B=5; C=6; D=2; E=2; F=1 (zero score); avg based on 18 exams = 73,6**

**Part 1.** Explain whether True, false, or whether it depends.. (25 points)

1.1 Consider the effect on farmland values in a net importing agricultural country that protects the sector. The changes in farmland prices that would result from liberalization of agricultural trade would be evidence in support of the factor-price equalization theorem.

T/D. Assume that ag production is more land-intensive than some other activities, e.g., services or manufacturing. Thus, Home, a net importing ag country, would tend to be less endowed with productive farmland. Protecting Home's Ag sector  $\rightarrow \uparrow P_A$  which would be capitalized in higher farmland values ( $\uparrow P_{\text{Farmland}}$ ). The scarce factor, ag land, is made more expensive by the protection. Liberalization of Ag trade would  $\downarrow P_A$  and land values in Home. In Foreign, a country that has a comparative advantage in agriculture, trade would  $\rightarrow \uparrow [P_A]_W$  and land values would  $\uparrow$  there pushing factor prices (land) toward equalization. It would also support the Stolper-Samuelson theorem as farmland is not mobile across countries.

1.2 When the poorest of developing countries can achieve productivity gains, they can become both richer and cheaper.

T. A problem of poverty and slow growth is slow productivity. Explain productivity and why it is a necessary condition for growth and development in long run. By using existing technology and copying production practices or products, developing countries can improve their use of factors and achieve faster growth rates, regardless of whether this occurs in agriculture or simple manufacturing processes. Even in S-R without trade,  $\uparrow$  prodvty  $\rightarrow \uparrow P_L$  but  $\downarrow$  cost of production per unit. [ $\uparrow Q$ ,  $\uparrow MP_L \rightarrow \uparrow P_L$  but can make  $\uparrow$  consumption possible.]

1.3 Deindustrialization from Dutch disease (where production of a natural resource competes with manufacturing) is inconsistent with what is predicted by the Rybczynski theorem.

F. Consider an economy with a manufacturing sector and a natural resource sector. A boom in a natural resource (oil/gas), originating from the world market, would result in growth to Home's economy which is endowed with the resource (shift in PPC toward the natural resource sector). An extended boom, an  $\uparrow P_{\text{oil}} \rightarrow \uparrow X$  earnings of natural resource relative to  $P_M$  (manu sector),  $\rightarrow \uparrow D$  for capital and skilled labor used in the extraction/refining of the resource. The  $\uparrow P_{\text{oil}} \rightarrow D$  for factors  $\rightarrow \uparrow P$  of the factors in that are in higher demand. Factors move toward the oil/gas, pushing up costs of capital and skilled L in other sectors that must compete with the natural resource sector, i.e., deindustrialization if factors leave the M-sector (and is accompanied by lower investment in M-sector). The boom in natural resources would be as predicted by the Rybczynski theorem. The eventual bust in natural resource sector would be consistent with "Dutch disease" and the natural resource curse.

1.4 Sector-specific technological change is more likely to cause trade dependency in a country because growth would be accompanied by pro-trade production and consumption effects.

F/D. Define trade dependency ( $\uparrow$  trade as % GDP). Sector-specific technological change would cause the PPC to shift disproportionately toward the sector affected by the change. There is nothing in the statement about whether the country is large or small or whether X or M sector experiences change. If X sector experiences  $\Delta$  tech, and if relative prices were unaffected as in the small country case, then production effects would likely be pro-trade, proportionally more toward prodn of X, but there is nothing in this info that suggests that consumption is pro-trade. If M sector experiences  $\Delta$  tech, under same conditions, then production effects would likely be anti-trade as proportionally more prodn of M. Again,

there is nothing that suggest how consumption is affected. The growth from the technology does not suggest that preferences must increase consumption toward imports. An increase in demand for the exportable would cause less trade dependency.

1.5 The Heckscher-Ohlin-Samuelson (HOS) model of trade would predict that most research and development activity is done in the industrialized countries.

T. R+D is a human capital and/or physical/financial-capital intensive activity for which there is no guarantee of a new tech process, improvement in the use of existing factors, business organization or new product or service. Given that mature industrialized countries are more endowed with human capital and physical/financial capital, R+D is more likely to be done there. New tech development is something that is generally produced in more mature economies for this reason. Developing countries can increase growth and development by adopting existing tech rather than undertaking expensive programs to invent new processes or products that are still unproven and subject to an uncertain outcome.

**Part 2.** Briefly answer the following questions or respond to the specific statements. (45 pts)

2.1 Suppose you are an advisor to the ministry of trade of a country whose main exports are commodities and main imports are manufactured goods. Part of your responsibilities is to provide advice to and consult with the minister and to produce a report.

2.1.1 The minister is concerned with how the terms of trade move against commodity exporters in the long run. Explain to the minister why this proposition may be correct or incorrect. (5 pts)

Recall what TOT means:  $TOT = P_A/P_M$  means how absolute prices change and the relative price change. It is the result of S+D in the ag sector *and* S+D in manu sector. Thus, a  $\Delta$  TOT is caused by  $\Delta$  supply, demand, and policy / regs in *both* the Ag and Manu sectors and in Home and Foreign. Be specific as to D and S characteristics of both sectors.

2.1.2 The report is on the forces that are likely to drive the country's terms of trade in the next two decades and the potential for faster growth. *List* the main points of the report and briefly explain each [make your assumptions clear]. (10 pts)

Depends on what you assume or argue in terms of CA or developing L-R CA:  
\* Role of gov't (investment in physical infrastructure – ports, roads –, education, R+D, providing mkt info)  
\* Role of trade policy in industry strategy (ISI or X promotion)  
\* technological changes in both sectors  
\* climbing up the value chain, commodity vs value-added product  
\* Foreign competition vs domestic CA or competitive advantage  
\* Demographics and demand-side factors

What is important is the focus on how this list relates to 2.1.1 ( $\Delta$ TOT).

2.2 Answering the following:

2.2.1 Suppose that in one country (Home) the ratio of land to labor used in production of livestock (cattle, sheep, etc.) is higher than that for production of crops (oats, wheat, etc.). In a more crowded country (Foreign), where land is more expensive and labor cheap, it is common to raise animals using less land and more labor than Home's



crop production. What might this scenario say about factor intensity in production of livestock and crops? (7 pts)

Define land-labor (D/L) ratio and relative prices,  $P_L/P_D$ . Focus on factor intensity (land-labor ratio) and maybe on what the isoquants and isocosts might look like. Recall, under the model in class we had L, K used intensively, respectively, in A and M:  $[K/L]_N > [K/L]_S$  and  $[K/L]_M > [K/L]_A$  meant manufacturing was K-intensity in m prodn in both countries, regardless of factor endowment. Here,  $[D/L]_{Home} > [D/L]_{For}$  but in Home  $[D/L]_{Live} > [D/L]_{Crop}$  and there is relatively more land than labor. However, in Foreign less land and more labor endowment results in  $[\downarrow D/L]_{Live}$  for livestock production while more labor in crop prodn implies  $[D/\uparrow L]_{Crop}$ . This means that both livestock and crop prodn have low D/L ratio r.t. for Home. This suggests factor intensities differ and prodn is due to factors other than factor intensity differences. Tech differences might account for differences in production and use of land and labor (substitution of D for L).

2.2.2 Consider foreign direct investment by a multinational corporation. How might the motivations for firm's internationalizing strategy (i.e., investing abroad) be different if the firm's strategy involved horizontal integration versus vertical integration? Explain. (8 pts)

Horizontal integration would involve helping the firm compete in the Foreign country or establish a base for exporting to third countries. It could be about using its existing advantages in production, or using its brand to increase markets. It could be about moving its product using the logistical advantages in Foreign. Could be about K-scarcity in the Foreign market and Home's FDI would be a boost in physical K to improve production in Foreign and maybe to build up a local brand.

Vertical integration would involve the firm taking advantage of an international supply chain, being closer to input suppliers or end users or retailers. The advantages would be more about than just about production but location and perhaps getting around regulations and trade policy.

2.3 The basic Heckscher-Ohlin-Samuelson (HOS) trade model assumes that comparative advantage is based on factor endowment differences under perfectly competitive markets. Other restrictive assumptions underpinning the HOS framework help to explain these trade patterns. Consider a situation where a country has an industry cluster (a regional concentration of related productive activities). Think about how an industry cluster might form and exist within a country and how this might be a deviation from the standard HOS model when answering the following:

2.3.1 *List* some strategic factors that could explain the development of an industry cluster within a country. (5 pts)

External EOS: industry-wide  $\downarrow AC$   
Product differentiation and focus on quality  
If cluster is small (niche market) then intra-industry trade  
Imperfect competition and market power (barriers, control over price)  
Proximity to critical input, raw material or resource  
Concentration of skilled labor (university or private sector technical training)  
Role of gov't (infrastructure, policy) R+D initiatives by gov't or private sector

Specialization in production in the cluster could be because of some resource endowments that led to skilled workers adding value that resource. The concentration of activity, e.g., extraction, use, refining or processing,

manufacture of value-added goods meant that close communication and info-sharing led to improvements in the overall industry. High barriers to entry exist for some reason.

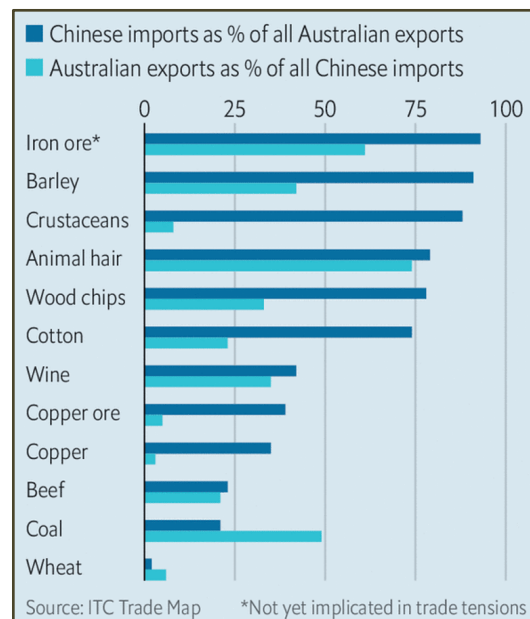
2.3.2 Using the list of strategic factors in 2.3.1, explain how the advantages could be lost in the longer term. Develop a story that might explain the breakup of the country's industry cluster. [Hint: it would be good to give a specific example.] (10 pts)

The cluster in a global context relates to imperfectly competitive trade, maybe intra-industry trade with Home specializing in some high-quality version of a good (high-end of the market). Specialization in a quality good, where the advantage might be about access to an important high-quality raw material (e.g., marble) but also to the skilled labor craftsmanship in the production of the goods (marble furniture, statues, pieces of art, jewelry).

The factors that might explain the breakup of the cluster: New discoveries of the resource elsewhere; cheaper substitutes for the good(s) become available; new technology allows capital to substitute for the raw material or specialized skilled labor employed in the industry (digital printing or outsourcing of labor for product design or other services); cheap labor elsewhere is able to produce "cheaper" competitive like goods. Changes in demand patterns.

**Part 3.** Answer questions related to the scenario described in the paragraph below. (30 pts)

To some extent, US trade policies under the Trump administration were applied as trade sanctions (i.e., a form of penalty) in response to foreign policy concerns that he had with allies and rival countries alike. China's foreign policy increasingly uses trade sanctions on countries with which it has disagreements. In 2020, foreign policy clashes with Australia were related to its call for an inquiry into the origins of Covid-19, Australia's rejection of China's claims in the South China Sea, and for holding joint naval exercises with the US, Japan and India. The sanctions against Australia came in the form of trade policy (e.g., on barley, beef, lobsters, and wine), and indirect restrictions from China's authorities discouraging firms buying Australian goods (e.g., coal, cotton, and timber products).



The chart presents selected China-Australia trade statistics for 2019.

3.1 List some concepts discussed in class that relate to the data in the chart. From your list, explain what might the data say about the effectiveness of China's sanctions? (10 pts)

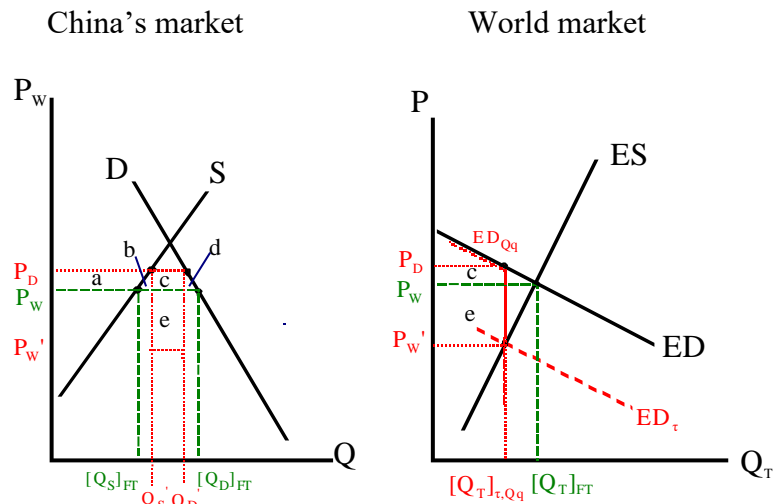
Trade dependence  
 Large-country trade policy implications (trade, economic, and welfare effects)  
 Trade policy (import restrictions – tariff or quota) and retaliation (trade war)  
 Commodity trade versus luxury good  
 Optimal trade policy: asymmetric effect on  $\Delta$ TOT – relative P-inelasticity of ES / ED  
 Industrial policy strategy

Australia appears more dependent on the Chinese market than China on Australia; could it mean that China is restricting Aussie's exports to punish it for interfering in

China's foreign policy matters? China would likely do this if/when its sanction would disproportionately hurt Australia and not negatively affect China as much. The objective is foreign policy not domestic protection or support to a sector.

3.2 Choose one of the products listed in the chart (other than iron ore) to model the implications of China's trade restriction on Australia (in a two-country world context). Graph a two-panel diagram (only China's domestic market and the world market but do not include Australia's market). Use the model to support your answer to 3.1. Explain and be specific. (15 pts)

Show the case of either a tariff or quota with ES being relatively P-inelastic, especially relative to ED by China. This will demonstrate that it is theoretically possible for China to inflict asymmetric pain on Australia and improve its own welfare (or reduce the degree of the pain the restriction can cause). Area 'e' shows that the TOT effect is greater on Australia.  $P_D$  only increases a little – meaning the pain is felt by Australia and to a lesser extent China. Sanction is intended to cause asymmetric pain. If  $e > (b+d)$  China's SW actually improves.



3.3 The footnote in the chart notes that iron ore is “not yet implicated in trade tensions” (i.e., it has not been targeted by sanctions). What might explain this? [Hint: Make whatever assumptions you want in order to tell a story.] Would a trade policy restriction have a different effect than an indirect restriction where authorities “discourage” firms from buying Australian iron ore? Explain and be specific. (5 points)

China is more dependent on Australia for iron ore. ED is relatively P-inelastic in the case of iron ore. Iron ore is an important input into production of some manufactured good or some value-added sector (steel). Iron ore could be a critical input into China's development (industrial strategy). China has avoided implicating this sector in its sanction because it does not want to hurt its own economy or industrial development. This product market is opposite of the situation in 3.2.

Either policy would likely hurt China, but the indirect restriction would likely not be followed without stricter conditions. Trade policy could lead to smuggling or finding ways around the strict restrictions (especially a quota). The indirect restriction would not attract as much attention as a tariff or especially a quota, decreasing the likelihood of retaliation.