Exam Solutions: ECN230 2025 retake exam May 2026

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

1.1 The inflow of capital, for example foreign direct investment, into a relatively capital scarce developing country has implications for the country's economic growth, but it is likely to have an anti-trade effect on production.

F. For K-inflows to have an anti-trade effect on production, there would have to be an increased proportion of the net imported goods/services produced as a % of GDP. FDI can go to either the import or export sector for all sorts of reasons, so FDI need not have to find its way to import sectors. FDI could go to the import-competing sector and imports could decrease (anti-trade effect on production. Or FDI could go to the export sector to increase production and exports (pro-trade effect on production).

1.2 Governments increasingly use trade policy as instruments of statecraft (i.e., strategic policy intervention), but an import subsidy is unlikely to be one of those instruments.

T. An import subsidy would be a case where a gov't assumes the cost of reducing the price of an imported good. This has to do with consumer affordability and so it has a cost to the gov't. Thus, an import subsidy is not typically applied by gov'ts. In cases where the imported good is unaffordable or there is an issue of access, e.g., staple food products, the government is unlikely to be able to afford the cost of the subsidy to the broader population. A net food importing country would likely be assisted by food aid by exporters or international donors than from an import subsidy.

1.3 If a tariff is imposed, then the balance of trade (i.e., the value of exports minus the value of imports) will most likely improve because exports are unaffected by the tariff.

F/D. A tariff can reduce imports and import payments, but maybe not affect exports and export earnings. In such a case BOT can be improved. However, recall Lerner symmetry, i.e., that an import restriction has symmetrical effects like an export restriction. Thus, restricting imports can negatively affect a country's exports. As goods are comprised of various components, some of which are likely to be imported, it will affect the cost of production of the final good, hurting the export of the final good. Suppose a country is a producer-exporter of cars and car parts. A tariff on imports of car parts will make producing a car more expensive, reducing competitiveness of a car. If this is the case, then the BOT might worsen.

1.4 If cross-border trade in goods was characterized as intra-industry trade, then trade restrictions would be less distorting and welfare reducing than if trade was between industries.

F. Intra-industry trade (IIT) is the exchange of like goods, e.g., cars for cars. IIT might be explained by demand-side factors such as consumers' preference for product differentiation. Demand factors can and do drive trade as well. If the EU restricted China's EVs with a tariff, then the EU's domestic market would distort both car markets for EVs and combustible engines.

1.5 If economies of scale are present in production, then trade need not be the result of comparative advantage.

T. With EOS, there can be a concentration in production (specialization) because a firm can reduce costs by virtue of increasing returns to factors used. The specialization in production is not the result of a country being better at producing the good. Firms/countries can engage in trade in goods even where there is near identical productivity. Countries with the same factor endowment can engage in trade.

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

2.1 In the early 1990s, economic growth seemed to come so easily. Globalization contributed to real GDP per capita doubling in emerging economies between 1995-2019. The trade share of global GDP rose from between 30-40% in the 1990s, peaking to around 60% in 2008 before the global financial crisis affected trade flows. However, the trade share of GDP has since stabilized at levels just under the peak despite rising geopolitical tensions turning countries towards protectionism and inward-oriented policies. [source: *Economist*, "Free exchange: Turning inward", 7 Nov 2020, p. 64.] Consider how GDP and trade might relate when answering the following:

2.1.1 *List* concepts that might be relevant to explain the relationship between growth and trade. Explain why or how a commodity-exporting country might have benefitted from an outward-oriented development strategy between 1995 and 2008. (10 pts)

Growth is the result of increased access to factors of production or more efficient use of existing factors of production.

* TOT * Productivity (tech Δ) * EOS * Trade policy (X-led strategy or ISI) * Comparative advantage * Inflow of factors * Pro-trade effects in Q, C, and trade

The focus should be on emerging economies' growth from commodity trade. Globalization increased global GDP. The global GDP led to increased demand for commodities. Manufacturing in Asia resulted in more demand for commodities for Asia to process, refine, manufacture, etc. Commodity exporting EMEs were able to increase foreign exchange earnings, and if used appropriately could result in K-accumulation and re-investment. By increasing production and productivity, it is possible that some EMEs could graduate along the value chain taking on various marketing functions – possible to focus on quality and not just quantity; take on storage, processing, refining, etc.). As global GDP was growing, it would have been possible to try to link to international supply chains and become more integrated into the world economy. There could be benefits of increased demand and strategic positioning of commodities as inputs into China's supply chain.

2.1.2 Explain import substitution industrialization (ISI). Could a commodity-exporting country have benefitted from trade policy to support ISI? Explain. (5 pts)

Depends what you argued. ISI is an inward-oriented industrialization strategy. The trade policy in support of ISI would include either import tariffs and/or export subsidies of manufactured goods (and possibly export tax on commodities). Focus on the Prebisch-Singer hypothesis and dependency theory. Commodities might be subjected to long-run decrease in TOT and from unstable world prices. Here you could argue the infant industry argument or the market failure problem of relying on commodities (Dutch disease). If there was a case of immiserizing growth, then policy intervention could be welfare improving.

2.2 Economic theory suggests that imperfect competition can give rise to the possibility of a market failure. In an international context, markets are more global which should suggest greater competition. Think about the factors that might characterize a competitive market when answering the following:

2.2.1 *List* factors that are related to the structure of an international market that might make it imperfectly competitive. (5 pts)

Recall the conditions for competitive markets: identical goods, mobile factors, similar tech, no transactions costs, no government intervention, many buyers/sellers, no control over price, low barriers to entry

* EOS * Product differentiation * Barriers to entry increase/high * Lag in tech Δ * policy or regulatory intervention * marketing strategies * transport costs

2.2.2 Explain whether trade policy could affect competition and result in a market failure problem. Could you argue that trade policy can correct a market failure problem? Explain. (10 pts)

Trade policy can affect competition, e.g., a tariff on foreign products lowers domestic competition. There is an interplay between protection and competition. A domestic monopoly could result from sufficiently high trade protection such that the monopoly could abuse its market power.
On the other hand, trade policy can correct a market failure problem. Define a market failure and/or provide an example. Too many imports can result in too little ag production which is linked to the provision of public goods. By restricting imports, there can be the provision of more public goods. Or export markets might result in overfishing, reducing the stock of fish resources. An export restriction can help to restore the stock.

2.3 The European Union (EU) is founded on four freedoms: the free movement of goods and services and free movement of labor and capital across member states. Think about the underlying economic theory when answering the following:

2.3.1 Why might it be difficult to predict the nature and level of intra-EU trade. (5 pts)

Free movement of goods means there are no trade restrictions within the bloc, but free movement of labor and capital means that production patterns will be difficult to predict. Trade can be based on inter-industry or intra-industry trade. Foreign K can buy local firms and consolidate to increase size and scale. Other sectors might be based on comparative advantage, land and climatic conditions. There is no clear relationship between factors flows and flows of goods/services. Countries with similar K/L ratios can engage in trade. Intra-EU trade can either be based on intra- and inter-industry trade and countries might have similar per capita income levels.

2.3.2 Why might an economist argue that the longer-run benefits of being a member of an economic union might exceed the short-term benefits? (10 points)

Short-run benefits from trade: this would result from having the same internal trade policy (no tariffs or quotas). Prices would converge and markets would be more competitive. The gains from trade would be from the change in prices that are more efficient and the process of specialization. These are static gains – once prices converge the gains will have been realized.
Long-term dynamic benefits would come from the free movement of labor and capital resulting in a bigger market, EOS and consolidation, different preferences. With K-flows come tech and innovation, productivity gains; with factor movement comes structural transformation (movement along the PPC) and potential for growth.

Part 3. Answer the questions related to the trade situation described 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 2025, the Democratic Republic of Congo (DRC) announced an export ban on its exports of cobalt because of the government's concern with international prices. Cobalt is a mineral that is a key ingredient in some of the batteries used in electric vehicles, and the DRC is the world's biggest producer of cobalt, accounting for 72% of global production in 2024. Later in 2025, the government removed the export ban in favor of an export quota. Think about the objectives and implications of the policy intervention when considering the following. [source: *Financial Times*, "DR Congo ends cobalt export ban in favour of quotas", 23 Sep 2025, p. 9]

Note: though the scenario is inspired by the DRC's policy over cobalt, the answer does not require you to know anything more about the DRC other than what is provided.

3.1 The DRC has expressed its intent to be a cobalt mining country. Could the export ban have been consistent with that objective? Provide a simple model to explain how an export restriction might affect the world market and the DRC's domestic market. [hint: just use a two-panel diagram of the world market and the DRC's domestic market.] (10 pts)

> Show the effects of an export restriction (or a ban). Explain what the objectives of an export restriction might be (e.g., increase TOT and export earnings, lower domestic price of a commodity to encourage value-added activity at home – more cobalt at home to encourage battery production), Show what happens to the world price and the domestic price. A ban is a total export restriction, so there will be no export earnings. Think about the relation between cobalt and it being a key ingredient in battery production. This would punish importers and their ability to produce batteries. If DRC does not have the ability to produce batteries from a lack of technical knowhow, then there is little benefit from restricting the export of cobalt to graduate along the value chain. Or it might be a means of encouraging investment to produce batteries in DRC.

3.2 Consider the shift from an export ban to an export quota. The government permitted companies to export based on their historical export performance. In 2026 and 2027, exports are to be capped at 96,000 tons, far below the 220,000 tons mined in 2024. How might the shift from a ban to an export quota affect the world market and the domestic market of the DRC? Use a free trade benchmark to discuss these effects. (15 pts)

> Graph the case of a large-country export quota. An export quota allows the government or domestic exporters to collect quota rents which can be substantial. Those rents can be used to learn how to produce batteries. At the same time, limiting cobalt exports could punish importers of cobalt and their ability to produce batteries. In time, DRC could develop a battery industry and export value-added products rather than just the commodity. You could show the ED to be price inelastic in which case the quota rents would be more impressive. A serious quota over the free trade benchmark could be an indication that the gov't was aiming for a "revenue-generating" export quota. Given how big a player DRC is in the global cobalt market the quota on historical grounds might be seen as trying to limit exports in a way such as to maximize quota rents.

3.3 Economists argue that a quota is more administrative than a tax. How might the export quota be a more complex instrument relative to an export tax in this context? Explain. (5 pts)

> It is a more complex instrument because the government will have to determine how much to export and by country. This means there will be all sorts of negotiations for how much will go to which trading partner, giving rise to politics and negotiations. A tax would simply allow the market to determine who pays and how much is exported to each trading partner.

Summary solutions. ECN230 exam 2025 N=51: mean of passing grade = 72,4
A=5; B=13; C=18; D=7; E=5; F=3

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

1.6 Economists argue in favor of globalization because of the benefits from international exchange. If so, then labor market liberalization should lead to the biggest economic gains from globalization.

T. The main point is the importance of P-differentials. The incentive for L-flows as with trade is based on P-differentials. L-regs have historically been strictest on L movements, resulting in the biggest P-differentials between workers (i.e. wages) in North and South. If so, then the benefits from trade in workers would be greatest. Many argued about costs and benefits, but this is true of trade in goods too. It was not enough to say there could be brain drain in South – there could also be benefits from remittances from workers who are abroad. Many confused the substitutability and complementarity of labor flows and trade. L moves for various reasons: to work with immobile capital, to work in services sectors, tradable or non-tradable, to work with abundant land, etc. L flows give rise to prodvty gains, increased Q, C and possibility to ↑SW.

1.7 If the market of a country is small relative to the global economy, then the objective of a tax on its import or export could not include revenue maximization.

F. First, do not confuse max tax revenue generation from trade with max SW objective – there is not optimal tax for a small country. For a small country trade policy, revenue collection and max tax can still be an important motivation for taxing trade (and is an important part of small developing countries' use of trade policy despite it not being an effective means of generating revenue). A consumption tax would be a better means of tax collection, but this has not stopped countries from collecting taxes from X, M. Trade tax as a % of total revenue can be quite high in some developing countries.

1.8 Import substitution industrialization (ISI) is a strategy aimed at increasing domestic manufacturing. For a developing country, an effective ISI strategy would involve importing components to domestically produce a final good.

F/D. ISI is intended to encourage domestic manufacturing and to capture value added locally. For a developing country, this could mean adding value to commodities, primary products and raw materials, i.e., inputs, that are locally produced using labor-intensive methods, rather than exporting those goods in their primary form. Producing final goods that intensively use local inputs and labor would allow the country to reduce imports, add value, perhaps even contribute to the export of those final goods. The more ISI depends on imported components (particularly capital goods or sophisticated intermediate goods) the more capital intensive the technologically advanced production becomes, making the final good more challenging to compete against foreign goods, and perhaps requiring greater protection or support from trade policy. You could argue depends on the stage of ISI and the level of development of the depending country – a more developed developing country could move up the value chain and ISI could be about complementing domestic R&D with cheap foreign components – but this sounds more like a more advanced economy.

1.9 When countries allow trade in monopolistically competitive sectors, the result will be a larger market with larger firms but with more competition.

T. Focus on monopolistically competitive markets (e.g., branded consumer goods). Do not confuse monopolistic competition with oligopoly or monopoly! Free trade with firms that have economies of scale will have lower average costs and can offer lower prices because of the bigger mkt. Despite the firms being "large", they earn higher profit margins (than under perfectly competitive markets), but still must compete on price or quality or reputation. Nevertheless, in the absence of trade those firms would have more mkt power.

1.10 If two countries have identical production possibilities frontiers and demand conditions, there would be no incentive for trade even if there were economies of scale in production.

F/D. Economies of scale (EOS) in production allows greater opportunity for trade. EOS allows for greater specialization within product sub-categories (intra-industry trade). Even if demand conditions were identical, there could be more of all product sub-categories available on the market, produced at lower cost per unit. This assumes there are no economies of scope. Demand conditions can mean that consumers have a preference for variety giving rise to IIT.

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

2.1 Restrictions on internationally traded goods normally come in the form of a tax (or tariff) on the traded good, or a quantitative restriction on its trade (i.e., a quota). Think about the similarity and differences, in terms of their economic effects and politics, of the policy choice when answering the following:

2.1.1 How might an economist rank the two trade policies (tax or quota) to restrict imports in terms of their economic effects on the domestic market, welfare and trade? Explain using a *list* of how the economic effects, the domestic and international politics, and the political administration of the two policies differ. (10 pts)

2.1.2 Use your list in 2.1.1 to explain whether it matters more to trading partners if the government of the country applied a quota on a good it imports or on a good it exports. (5 pts)

2.1.1 A tax on imports is preferred to a quota under most situations (quota provides more dom mkt stability):

You could have provided a simple model of tariff/quota equivalence in trade, welfare and economic effects.

Econ effects (short-term) of tariff/quota are same
* $\uparrow P_D$, [$\downarrow P_W$ if large country], $\uparrow Q_S$, $\downarrow Q_D$
* Tariff revenue to gov't vs quota rents to different actors, domestic or foreign

Econ effects (long term): quota insulates dom mkt from ΔES (instability on world mkt) – quota better for dom mkt stability; if ROW has CA in the good in L-R, then quota is more distorting

Welfare effects (small-country case) basically the same
* $\uparrow$ PS, $\downarrow$CS, $\downarrow$ NSW (if quota, rents can go to foreigners)
* If tariff, revenue leads to $\uparrow$G, if quota it depends on administration

Trade effects: both tariff and quota reduce imports

Why economists in general prefer tariffs:
* Economic efficiency – a tariff is not a quantitative limit
* Non-discrimination - a tariff can be applied on all partners the same; quotas discriminate
* Transparency/predictability – the effects of a 10% tariff easy to understand
* Political administration – quotas require some sort of licensing or allocation mechanism

* Revenue - tariff rents go to gov't; quota rents depend on licensing system and leads to rent-seeking which often in non-competitive
* Politics – quotas and quota rents lead to lobbying as rent-seeking behavior
* Int'al negotiations - quotas must be negotiated with partners because of the discriminatory effects and the quotas serve as an "economic bribe"

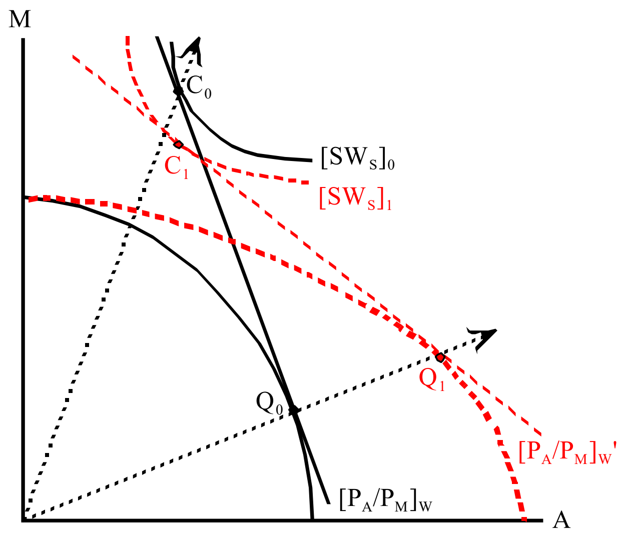
2.1.2
It could matter – think about the motive (esp of a quota), type of country (large) and type of good (strategic). An export quota would have similar effects to an import quota in terms of the economic and political effects listed above. In both cases, if a large country, TOT would be improved for the imposing country. However, under an export quota the objective of measure would likely be more about receiving the international income transfer (or to hurt importers, intended or not). The license for the import quota could be granted to exporters, and the quota rents would then go to the exporting government or its firms. Import quotas can be negotiated as a voluntary export restraint – bribe exporters with the rents to comply with the quantitative restriction. The export quota would limit supplies to foreigners reducing access. There is no good way to negotiate with importers. If no substitutes are available in S-R (strategic good), then it can be intended to hurt import partners.

2.2 Consider the relationship between economic growth and trade. For simplicity, assume a large country's macroeconomy consists of two sectors, an import and export sector. Think about growth and how it, in turn, might affect trade when answering the following:

2.2.1 Explain how the Rybczynski theorem might be applied to understanding economic growth. (5 pts)

2.2.2 Suppose that growth occurs in a country for some reason, but its export good is considered an inferior good by consumers in general. Explain how such preferences might affect this country's trade and welfare. (10 pts)

2.2.1 Rybczynski theorem and growth
Define growth. Growth can occur through a tech advancement that allows the economy to use the existing stock of K and L more efficiently (to produce more output from the full employment of K,L) or through an increase in the stock of K and/or L. The Rybczynski theorem relates to the latter. If there is an increase in the stock of K or L, then there will be a disproportionate increase in the ability to produce the good that uses that factor more intensively. The graph shows ↑L stock that → disproportional ↑Q_A. The A-good (agriculture) is the export good and the M-Good (manufacture) is imported.



2.2.2 Suppose growth occurs from an increase in L and L is used intensively in Q_A as in the figure. The large country experiencing growth has two effects: a positive real effect and a negative TOT effect. The growth → ↑Q_A but ↑Q_A → ↓P_A relative to P_M (the TOT effect). If A is an inferior good, then the decrease in price of A relative to M will be even more pronounced and could result in immiserizing growth. Despite the real effect (increase in output), if A is an inferior good, then as income goes up demand for the good goes down. The inferiority of A r.t. M can also contribute to the worsening SW.

2.3 Factors flowing across countries is a form of economic globalization. Think about the implications to a domestic economy of capital inflows in the form of foreign direct investment (FDI) when answering the following:

2.3.1 *List* reasons why FDI inflows might occur in the receiving country. (10 pts)
2.3.2 How might the items on your list under 2.3.1 differ if the FDI-receiving country were a mature economy or a developing country? Be specific. (5 pts)

2.3.1 Potential reasons for FDI
* K moves to where it is scarce (and returns are greatest)
* K moves to work with specific L (cheap, skilled, immobile L)
* K moves to work in specific sectors: services, mining, manufacturing, K-int sectors
* K moves to avoid trade restrictions in foreign mkt
* K moves to avoid taxes or regs in the firm's domestic mkt
* K moves to improve a firm's global supply chain:
  - for a value-adding firm to be closer to key inputs/resources/raw materials/commodities
  - for an input-supplier (car parts) to be closer to the manufacturer (car maker) it supplies
  - for a manufacturer/provider to be closer to its end users (consumers)
* K moves to manage/control for political/economic/business risk
* K moves to transfer tech: innovation, R+D, business organization, etc

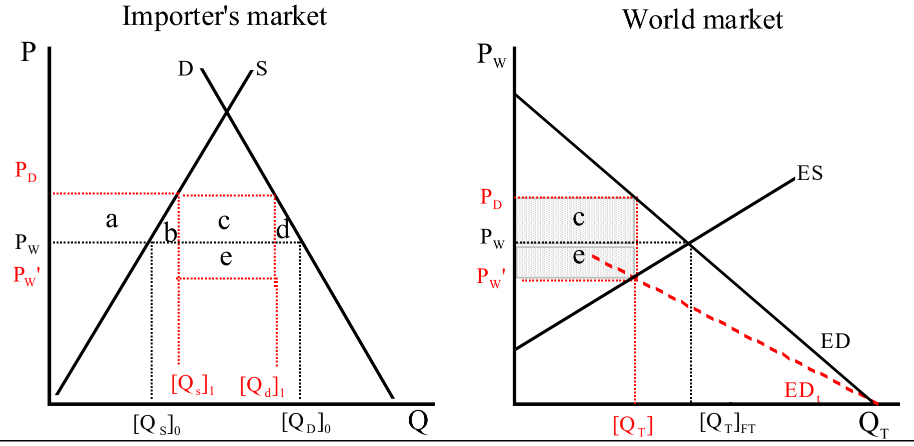
2.3.2 Relate list to FDI in a mature or developing country – depends on the list
<u>Mature economy</u>: K-scarcity is less an issue, advanced tech (R&D) and improving global supply chain; issues related to intra-industry trade and product differentiation and imperfectly competititve mkts might be stressed; FDI could be a means around trade restrictions; location to high-Y consumers or skilled-L
<u>Developing country</u>: K-scarcity might be bigger issue; extraction of minerals or processing or refining natural resources or commodities can be K-int; FDI might be a means around taxes or regs in the firm's domestic mkt; FDI could be about working with cheap, abundant L; FDI could be to develop services sectors (banking and finance, telecom, etc)

Part 3. Answer the questions related to the trade situation described below. (30 points)

As a candidate for president, Mr. Trump indicated his intention to apply tariffs across all goods and trading partners. As president, the US has increased tariffs across countries, but some sectors were excluded. The US is a large country importer of many goods whether as commodities, components (inputs), or final products. The Trump administration has stated on record that tariffs will bring in billions of dollars in revenue, which will be paid by foreigners. He also made the point that a trade war is easy to win because exporters to the US have "ripped off" the US, essentially making the US poorer.

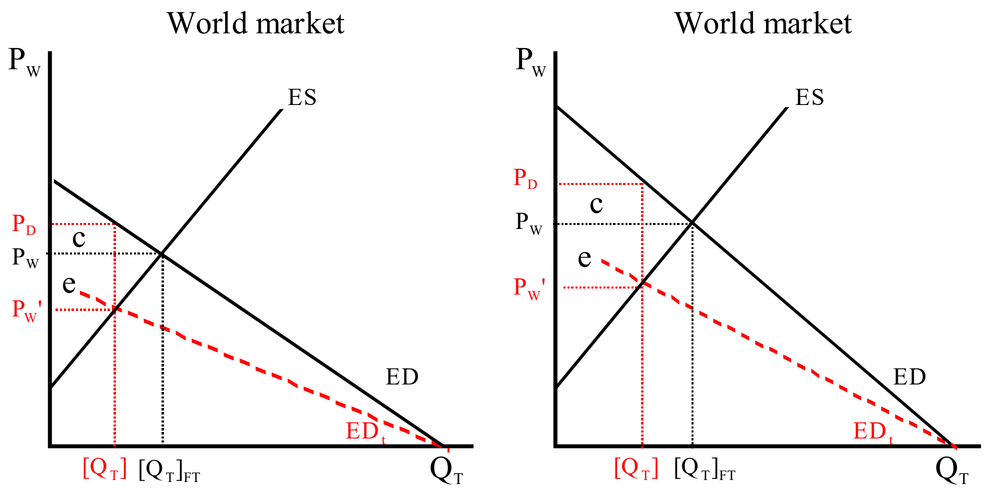
Note: though the scenario is inspired by what the Trump administration is doing, the answer does not require you to use the US as a specific example.

3.1 Construct a detailed, two-country model of an ad valorem import tariff by a large country. Show and interpret the meaning of the welfare changes to the importing country. Graph the importer's market and the world market, i.e., just a two-panel diagram. (10 pts)



ΔCS = -(a+b+c+d) tax equivalent to consumers
ΔPS = + (a) support equivalent to producers
ΔG = + (c+e) gov't revenue from tariff
ΔNSW = (e) – (b+d) where (b+d) are DWLs – efficiency losses to society

3.2 Use your model in 3.1 to reflect on the statement that the tariff will raise billions in government revenue given that higher tariffs are being applied across a wide range of goods. Which economic actor(s) might pay the revenue that is collected by the government? What determines how much is paid by the different economic actor(s)? Be specific - you could show a different model of the world market to help explain your answer. (10 pts)



The two graphs have the same ES which is more price inelastic that shown in 3.1. The revenue is the value of areas (c+e). Area (c) is the part of the revenue that is collected from domestic consumers in higher domestic prices, i.e., a tax on consumption. Area (e) is the part of the revenue that is an income transfer from foreigners. This is the result of the reduction in world price, i.e., a TOT advantage gained by the large-country importer. If area (e) is larger than (c), then a bigger share of the revenue would, in fact, be collected from the foreign firms. However, for the importing country to increase revenue and have foreigners pay for it, this would have to happen across many sectors in which goods are imported. This would require ED to be relatively more P elastic relative to ES (or ES to be relatively more P inelastic) for most imported goods.

3.3 Think about what other goals there might be by increasing import tariffs across various goods. How would you respond to the argument that a trade war is easy to win if all that is used were higher import tariffs? Defend your answer. (10 pts)

Depends what you argue. Tariff could be to increase manu, employment. You could have cited Lerner symmetry – that a tax on imports is like a tax on exports. If imports and exports are highly correlated, then a tax on imports would affect exports. The tariff might increase jobs and economic activity in the import sector, but it would hurt the country's export sectors. Retaliation by trading partners is another possible outcome and would reenforce this effect.
If the cost of imported components were to rise (as expected), then the desired increased in economic activity might not happen because costs increase and the higher prices might put off consumers. This could hurt the desired "re-industrialization" and not $\rightarrow \uparrow Q_M$, L_M.
Tariffs on steel imports will cause the price of steel to increase and raise the costs of all sectors that use steel in production. If tech Δ is the cause of de-industrialization, then tariffs will not work anyway. The more the country depends on trade (export and import), the more the policy will move the country to autarky, lowering income and growth.
