Haberdashers' School

Occasional Papers Series in the Humanities

Occasional Paper Number Seventy-Eight

Optimal Tariff Theory

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February 2025

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Abstract

Not since the 1930s have tariffs figured so prominently in global trade policy. It is conventionally believed that economic theory holds tariffs to be contrary to the interests of any country that levies them and that free trade maximises social welfare both for the world as a whole and for the individual countries that constitute the international economy. While this may be true for the world as a whole, economic theory in fact shows that free trade does not maximise social welfare for most individual countries and that the optimal level of tariffs is not zero but positive. The argument for the welfare benefits of tariffs is known as *optimal tariff theory*. This paper outlines the classical case for the benefits of free trade, before explaining optimal tariff theory and referencing various studies that have sought to estimate the relevance and level of optimal tariffs in the current global trading context. The article concludes that there is a tension between the interests of individual nations and the world trading system as a whole. Although the world as a whole benefits from free trade, any given country can *improve* its social welfare by imposing a tariff. This suggests that tariffs will be the dominant strategy and to prevent such deviations from free trade a vigorous set of international institutions to uphold free-trade are required – something which appears less and less likely to obtain. Hence, we can expect tariffs to become increasingly prevalent in the future.

Donald Trump is very keen on tariffs. 'To me,' he said before the 2024 election, 'the most beautiful word in the dictionary today and any is the word "tariff". It's more beautiful than love; it's more beautiful than anything. It's the most beautiful word. This country can become rich with the use, the proper use of tariffs.'[1] But for most economists, few words are uglier than the word 'tariff'. Indeed, the origins of modern economics and the theoretical vindication of the benefits of free competitive markets were largely wrapped up with the struggle to overturn the British government's use of tariffs to raise revenue and protect domestic industry. This battle came to a head in the controversy over the Corn Laws, a piece of legislation designed to limit the importation of cheap wheat and barley into the UK until the domestic price of these

[1] 'Tariff is the most beautiful word.' Not for economists! – The Sloman Economics News Site

products reached a certain minimum price. The case against the Corn Laws was developed by such classical economists as David Ricardo and James Mill and in 1846 the prohibition on the import of grains was lifted and Britain entered the golden age of free trade policy. Yet even in the early nineteenth century the economist Robert Torrens drew attention to the possibility that the imposition of a tariff might benefit the home country. As a result of work by economists in the twentieth century, notably Johnson, Kaldor, Lerner, Meade, and others, this proposition has been firmly established. As Broda, Limao, and Weinstein wrote in a 2007 article:

> The idea that a country can improve its terms-of-trade and welfare through the imposition of tariffs has been in the economic literature for over a century. Since then, economists have known that the optimal tariff is positive for goods that are supplied inelastically.[1]

While some economists may have known this, many teaching and studying the subject will still be surprised to learn that, for most larger economies, social welfare is higher *with* tariffs on imports than without, and one rarely encounters this idea in the pages of the financial press. In this paper we first set out the classical case free-trade case *against* tariffs before explaining why, for most trading countries, a tariff will be *optimal* in terms of social welfare.

The Neo-Classical Case Against Tariffs

Consider the domestic market for a good, say electric cars. Assume, first, that there is no trade. All cars in country X are manufactured and purchased within that country and no other cars are available. The initial domestic market equilibrium is shown in **Figure 1**.

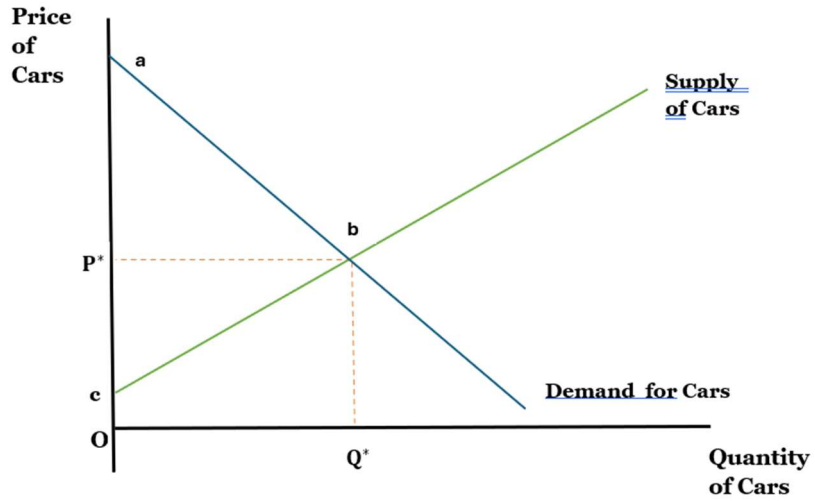

Figure 1. Domestic Market for Electric Cars

In **Figure 1**, the domestic equilibrium price is P^*, with the quantity of electric cars Q^* being bought and sold. The consumer surplus of car buyers (the difference between what consumers are willing to pay for cars and what they actually pay) is the area beneath the

[1] C. Broda, N. Limao, and D. Weinstein, 'Optimal Tariffs: The Evidence', *Columbia Business School Center on Japanese Economy and Business Working Paper Series*, September 2007, Number 254.

demand line **abP***, while the producer surplus (the difference between what producers require to produce cars and what they are actually paid for cars) is **P*****bc**. The total social benefit from car production and consumption is consumer surplus plus producer surplus, namely **abc**.

To see how free trade can benefit country X, imagine that the global price of cars outside country X is Pw.[1] This is the world price of electric cars. We assume these cars are identical with the cars currently being made in country X and we assume that this world price of electric cars is *below* the existing domestic price. **In Figure 2** we take this global price to be Pw as indicated.

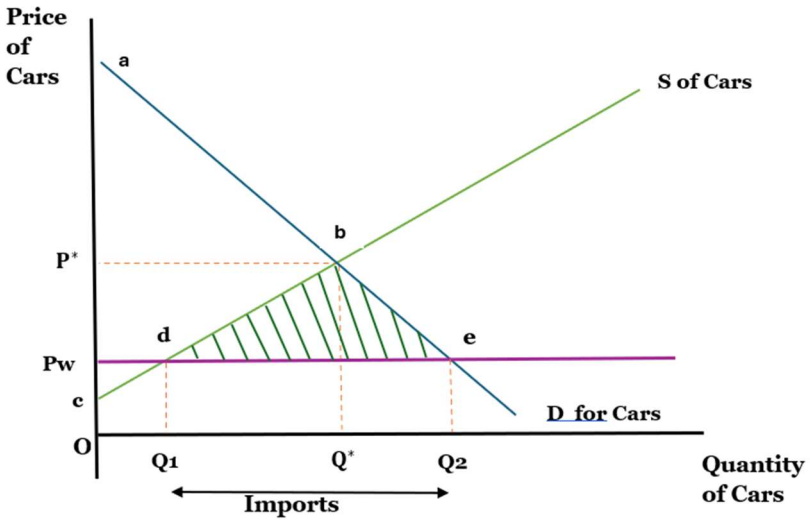

Figure 2. Domestic Market for Cars with Free Trade

Since country X can now access the global price of cars at Pw, no consumer will pay more than Pw for an electric car. We assume that, at first, they buy cars made in country X, but at price Pw the domestic supply of cars is only OQ1, whereas the demand for cars is OQ2. Hence the difference between the domestic demand for cars and the domestic supply of cars is met by *imported* cars. Thus, in **Figure 2**, when the price is Pw the domestic supply of cars is Q1 and the domestic demand for cars is Q2 and the difference Q2 – Q1 is met by imported cars. As can be seen, we assume that any number of cars can be purchased abroad at the price Pw, which is to say that the global supply curve of cars is perfectly elastic.

What, then, has been the effect of opening-up country X to trade in electric cars?

- The price of cars has fallen significantly, from P* to Pw.
- With the fall in the price of cars, domestic demand for cars has also increased, from Q* to Q2.
- The combined effect of the fall in the price of cars and the increased consumption has been to result in a large increase in consumer surplus, from **abP*** to **aePw**. This is a measure of the gain to consumers of free trade in cars.

[1] For the analysis of the welfare effects of free trade, see P. Krugman and R. Wells, *Economics* (Macmillan, Basingstoke, Third Edition, 2013), pp. 221-224.

- However, the fall in the price of cars means that for most domestic car producers it is no-longer profitable to make cars in country X. Only a few home producers with low costs survive, producing OQ1. As a result, producer surplus falls from **P*bc** to **Pwdc**. The area **P*bdPw** is a measure of the loss to producers of the introduction of open trade in electric cars.
- To calculate the net welfare effect of trade we must deduct the loss to producers from the gain to consumers, that is **P*bePw** minus **P*bdPw**. The difference is the shaded area **dbe**. These are the net gains from trade. Since the gain to consumers exceeds the loss to producers, in theory the consumers could compensate the producers for their welfare loss and still be better off.

Thus can be understood the classical economic case for free trade, which has been shown to yield a clear social welfare gain. Such a conclusion is reinforced when we consider the impact on social welfare of imposing a tariff.

The Effect of a Tariff

A tariff is a tax levied on a good when it is imported. It is levied (initially) on the importer. A specific tariff is a fixed charge per unit of the import – such as £1000 per electric car imported. An *ad valorem* tariff is a tax levied as a percentage of the initial import price – such as 20% on the import price of an electric car. In both cases the tariff increases the cost of importing a good into the country.[1]

For simplicity we take a specific tariff and assume it is set at the amount **t**. The effect of imposing such a tariff is illustrated in **Figure 3**.

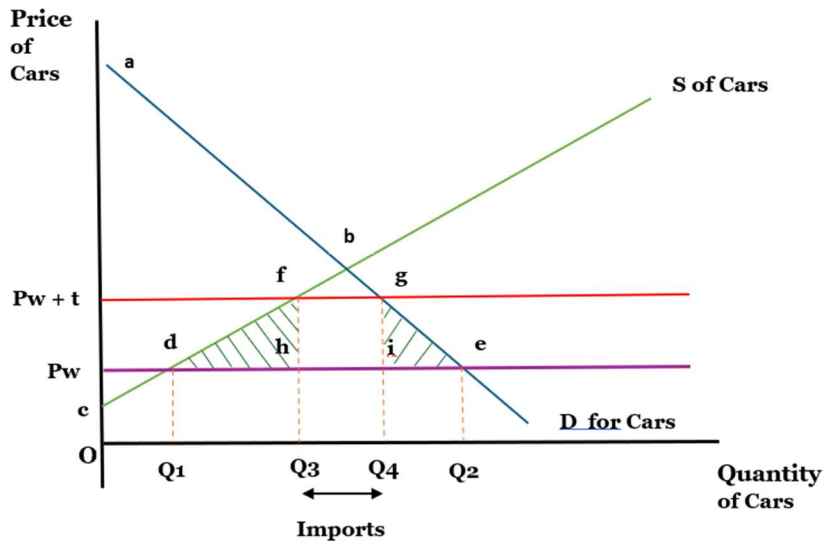

Figure 3. The Impact of a Specific Tariff

[1] For this section, see Krugman and Wells, *Economics*, pp. 228-230; P. Krugman and M. Obstfeld, *International Economics: Theory and Policy* (Addison-Wesley, Boston, Sixth Edition, 2003), pp. 195-197; W.M. Corden, *The Theory of Protection* (Oxford University Press, Oxford, 1971), pp. 5-8.

The effect of imposing the tariff **t** is to raise the import price of cars from Pw to Pw + t. An importer no longer just buys cars in the world market at price Pw; they also have to pay the government the tariff **t** to bring that car into country X. Hence, the price at which country X accesses the global market for electric cars rises from Pw to Pw + t. What are the effects of the new domestic price of Pw + t?

- The domestic price of electric cars rises from Pw to Pw + t. With the rise in price, the demand for electric cars falls from Q2 to Q4.
- The domestic output of cars rises from Q1 to Q3 since, at the higher price, more firms find it profitable to produce cars for the domestic market.
- With demand falling and home production increasing, imports fall from Q1Q2 to Q3Q4.
- The chief loser from the tariff is domestic consumers. They now pay more for cars and they consume less. Consumer surplus falls from **aePw** to **agPw+t**, a net decline of **Pw+tgePw**.
- The chief gainer from the tariff is domestic producers – they are producing more at a higher price. Their producer surplus increases by **Pw+tfdPw**.
- Another gainer from the tariff is the government. Given that the tariff is t and imports are Q3Q4, the tariff generates revenue for the government equal to **fghi**. This revenue can be used to cut other taxes.

Thus, a tariff brings winners and losers. What is the overall outcome? A tariff is generally held to bring a *net welfare loss to society*. This is because the welfare loss of losers (consumers) exceeds the welfare gain of the winners (producers and government). We can see this from the diagram. As we have seen, the loss in consumer surplus from the tariff is **Pw+tgePw**. Of this welfare loss, the amount **Pw+tfdPw** is re-located to increased producer surplus and is not a net loss to society, and **fghi** is re-located to the government and can be used to increase welfare by cutting taxes or funding benefits, so again is not lost to society. However, this still leaves the amounts **dfh** and **egi** which are not redistributed but are simply lost to country X. Together these two amounts represent the deadweight welfare loss from a tariff and are indicated at the two shaded segments.

This deadweight loss has two components. First, there is a *production distortion* which arises from the fact that domestic producers have increased car production. This is a loss to society since these domestic producers make cars at a higher cost than the cars that could be bought on the open market: so society is using resources to make cars at a higher cost than they could be obtained from the world. This is a waste of domestic resources since these resources could have been used to make something more valuable to society. This production loss is the left-hand triangle **dfh**. Second, there is a *consumption distortion loss*, which is the right-hand triangle **egi**. This arises from the fact that, due to the tariff, consumers have been forced to cut back their consumption of cars. At consumption Q4 the consumers demand line is above the world price of cars Pw. Consumers would benefit from consuming more cars at the price Pw but they cannot access these cars due to the tariff. Hence their deadweight loss from the tariff is **egi**.

Figure 3, then, sets out the essential free-trade case *against* the imposition of tariffs. There are many other points that could be made against tariffs, but the basic argument is that tariffs raise prices, reduce consumption, reduce consumer surplus, and lead to excessive high-cost domestic production of the protected industry. This is the reason economists have traditionally considered tariffs very far from beautiful.

The Case for Tariffs – Optimum Tariff Theory

Just as there are numerous arguments against the imposition of tariffs, so are there many arguments in defence of tariffs. Here we focus on the case for a tariff as a means of maximising a country's gains from trade. This is the *optimum tariff theory.*[1]

So far we have made a tacit assumption in our analysis. This assumption is that country X is a small country such that its demand for electric cars is a small part of the total world demand for electric cars. This means that country X can buy any amount of the global supply of electric cars *at the same price*. This was why we could assume that the global supply of electric cars was *perfectly elastic* at the global market price Pw. Clearly, this assumption may be justified for many small economies: if New Zealand or Malta or Kenya buy more or less electric cars, they are unlikely to affect the global equilibrium price of electric cars. But it is unlikely to be true for larger economies. If the USA or China or Japan or Germany buy more or less electric cars, then this action will probably impact on the global equilibrium price of electric cars. If they buy more, price Pw will rise, and if they buy less, price Pw will fall. The effect of this is to change the effect of imposing a tariff. Indeed, it is possible that for such a larger country a tariff can yield a net welfare gain for the society. This is the case for an *optimum tariff.*

To understand this point, let us amend **Figure 3**.

[1] The first economist to articulate the argument for an optimum tariff was Robert Torrens in his 1824 *Essays on the Production of Wealth*. For this and subsequent developments of the theory see T.M. Humphrey, 'Classical and Neoclassical Roots of the Theory of Optimum Tariffs', Federal Reserve Bank of Richmond, *Economic Review* (July-August, 1987).

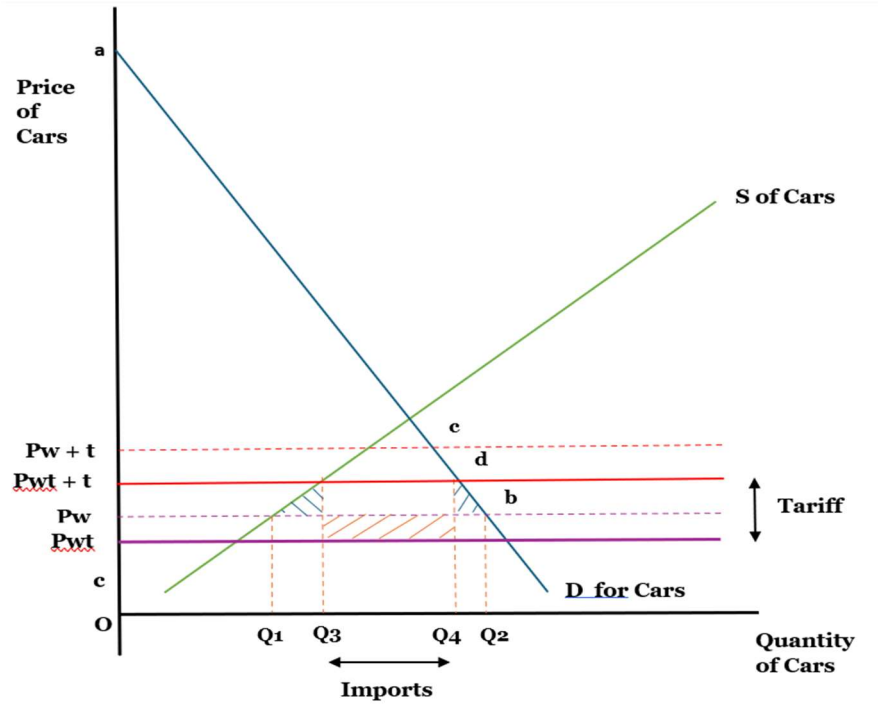

Figure 4. The Impact of a Tariff on the Terms of Trade

In this diagram, assume first free trade, with country X accessing electric cars at the world price Pw. Total consumption of electric cars is OQ2, and of this quantity, Q1Q2 are imported. Consumer surplus is **abPw**. Now imagine that a tariff **t** is applied. Previously we assumed that the effect of this tariff is to raise domestic prices to Pw + t, with consumer surplus falling to **acPw+t**. However, this outcome was based on the assumption that the world price of cars did *not* change if country X consumed less electric cars. Now we assume that country X's demand for electric cars is a significant component of the world demand for such cars; hence, as country X demands fewer cars *the world price of electric cars falls to* Pwt. What this means is that the *terms of trade*, which is the ratio of a country's export prices to its import prices, have moved in favour of country X. Country X is paying less for imported electric cars than before and this, in itself, makes country X better off. In terms of **Figure 4**, since country X now faces a lower global price of electric cars, the domestic price after the tariff (i.e. Pwt + t) is *lower* than our previously assumed domestic price post tariff (Pw + t). The domestic price of electric cars has still risen due to the tariff, but it has risen by less. Thus, of the total amount of the tariff, about half is paid by domestic consumers, and half is paid by foreign suppliers who now receive a lower price for their car exports to country X (and indeed to other countries in general).

In terms of the welfare effects of the tariff, there is still a deadweight loss due to production and consumption distortions, as indicated by the two shaded triangles. These losses, however, are less than before since the post-tariff price has increased by less. Furthermore, there is an additional welfare benefit since the government's revenue from the tariff has increased. This is because, while the absolute amount of the tariff has not changed (being **t**), imports are larger now since price has risen less meaning domestic consumption has fallen less and domestic production has risen by less. So, the quantity of trade taxed has increased.

And of this tariff of **t**, where previously it was all paid by domestic consumers, now only half is paid by domestic consumers and the other half is paid by global car producers who receive a lower price for each car exported to country X. This welfare benefit accruing to the state is indicated by the shaded rectangle. As can be seen, if the shaded rectangle is larger than the two welfare-loss triangles, then the tariff can actually *increase* total social well-being. In this case, the positive effect of the tariff on the terms of trade offsets the negative effect of the tariff on the initial domestic price level.

This situation, where a tariff can shift the terms of trade in favour of the levying country, arises from the fact that a large country will be a *monopsony* purchaser of imported goods. A monopsony consumer is one whose consumption of a good is sufficiently large relative to a market to ensure that, when the consumer increases its purchases, *the effect of its increased demand is to raise the equilibrium price of the product*. This is what we are assuming here, though we have highlighted the point in reverse: as country X *reduced* its purchase of electric cars it *lowered* the global equilibrium price of cars. Likewise, when country X purchased *more* electric cars it *raised* the equilibrium price of cars. This is what we mean when we say that country X does not, in fact, face a perfectly elastic supply curve for electric cars. Only small economies face a perfectly elastic supply curve for imported goods and for such small countries an optimum tariff level is zero. But larger countries will tend to face an upward sloping supply curve for imports, and for such countries *an optimum tariff will be positive*. This point can be explained with reference to **Figure 5**.

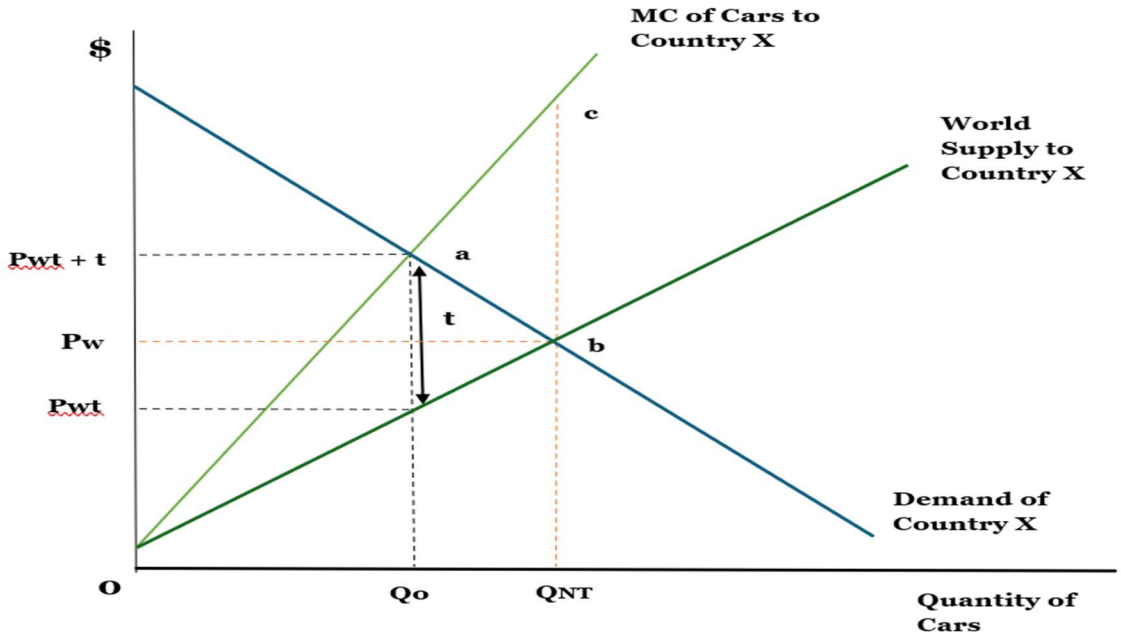

Figure 5. An Optimum Tariff when a Country is a Monopsony Buyer of a Product

In this diagram, the downward sloping demand line is country X's demand curve for imported cars. The global supply curve for electric cars is upward sloping world supply line – as country X buys more cars on the global market it raises the world price of electric cars. The free-trade equilibrium price of cars is Pw, and country X imports Q_{NT} of cars. However, Q_{NT} is *not* the efficient welfare-maximising consumption of cars by country X. The reason is that, as country

X buys more cars, it shifts the terms of trade against itself, driving up the global price of cars. This means that the marginal cost of a car for country X is not the price of the car. The marginal cost of a car is the price of that car *plus* the increase in the price of all the cars it is already importing. For example, suppose country X imported 1000 electric cars a year at a price of $10,000 a car. The total cost of importing those cars is 1000 x 10,000 = $10,000,000. Now imagine that country X wishes to buy an additional car per year, and this raises the global price of cars from $10,000 to $10,100. Hence the marginal cost of that car is $10,100 plus the extra $100 for all the 1,000 cars it was already importing, which now all cost $10,100 instead of $10,000. Hence the cost of the extra car is $10,100 + (1,000 x 100) = $10,100 + $100,000 = $110,100. This is a rather extreme example, but it makes the point. It means that the last car purchased by country X cost the person who bought it $10,100, but it cost country X as a whole £110,100. Such a purchase represents a deadweight welfare loss: the benefit to the marginal consumer of the last car purchased is measured by its price, which is $10,100; but its cost to country X's population as a whole is $110,100. Clearly the marginal cost far exceeds the marginal benefit – the car has reduced the welfare of country X. In **Figure 5** the marginal cost of buying more cars is the MC line *above* the supply line. The optimum quantity of cars for country X is Qo, where the demand (marginal benefit) line intercepts the MC of cars line. By consuming at Q_{NT} the society incurs a deadweight social welfare loss of **abc**. In effect, the society is consuming too many imported cars and should reduce its consumption to Qo. As Abba Lerner expressed the point in his *The Economics of Control*:

> If the country chooses to disregard entirely the effects on the rest of the world economy, it imports and exports less … Instead of importing goods up to the point where the price of the import (including the cost of transport) equals the domestic price, it will import only up to the point where the marginal cost to the country of importing another unit – the increase in the total amount spent on the importation of the goods – equals the domestic price … If the elasticity of supply of a good is infinite, so that the price does not rise at all when more of it is bought, the marginal cost to the nation is equal to the price per unit … But if the country's purchases have some influence on the price, so that when it buys more the price, which is the *average cost*, rises, then the *marginal cost* is greater than the price, or average cost, and there is a divergence from the optimum allocation of resources.[1]

To reduce imports of cars to the efficient quantity Qo the country can impose an *optimum tariff*, indicated by **t** in the diagram. What this tariff does is raise the import price of cars to reflect the actual marginal social cost of purchasing the cars so that the MC line now intersects the demand line at Q_0. This is the social welfare maximising import of electric cars. The deadweight loss has been eliminated. Because country X is purchasing fewer cars the global price of electric cars falls to Pwt. Since country X is now paying less for cars (the terms of trade effect) the burden of the tariff is split between domestic consumers and foreign suppliers. Domestic consumers pay (Pwt+t – Pw) of the tariff per car, and importers pay (Pw – Pwt). The government's revenue from the tariff is t x Qo.

[1] A. Lerner, *The Economics of Control: Principles of Welfare Economics* (Macmillan, New York, 1944), p. 357.

Calculating the Optimal Tariff

The size of the optimum tariff depends upon the elasticity of supply of the global supply of the product the country imports – in our example, electric cars.[1] The more inelastic the supply line the greater will be the terms of trade effect of the country's imports from the global market and the larger will be the optimum tariff. To see this, consider **Figure 5**. The point of the tariff is to ensure that the domestic price to consumers is equal to the marginal cost of purchasing cars on the global market. This occurs of when the price of cars *after* the tariff is Pwt+t. The amount of the tariff which secures this result is (Pwt+t) – Pwt. This is the amount **t** indicated. The rate of the tariff relative to the global purchase price of cars is:

$$\frac{(\mathrm{Pwt+t}) - \mathrm{Pwt}}{\mathrm{Pwt}}$$

Viewed from the perspective of country X, Pwt+t is equal to the Marginal Cost to country X of buying the product, while Pwt is the price P of imported cars when Qo cars are imported. Hence, we can re-write the rate of the tariff as:

$$\frac{\mathrm{MC}-\mathrm{P}}{\mathrm{P}}$$

The Total Cost for country X of purchasing cars on the global market is:

TC = PQ

where P is the world supply price of electric cars as expressed by the world supply curve. P is a positive function of Q, that is:

P = f(Q)

Hence, the Marginal Cost to country X of purchasing additional units of cars is:

$$\frac{\mathrm{dTC}}{\mathrm{dQ}} = \frac{\mathrm{d(PQ)}}{\mathrm{dQ}}$$

Using the product rule, this can be written:

$$\frac{\mathrm{dTC}}{\mathrm{dQ}} = \mathrm{P}\,\frac{\mathrm{dQ}}{\mathrm{dQ}} + \mathrm{Q}\,\frac{\mathrm{dP}}{\mathrm{dQ}}$$

$$\frac{\mathrm{dTC}}{\mathrm{dQ}} = \mathrm{MC} = \mathrm{P} + \mathrm{Q}\,\frac{\mathrm{dP}}{\mathrm{dQ}}$$

It follows that:

$$\mathrm{MC} - \mathrm{P} = \left(\mathrm{P} + \mathrm{Q}\,\frac{\mathrm{dP}}{\mathrm{dQ}}\right) - \mathrm{P}$$

$$\mathrm{MC} - \mathrm{P} = \mathrm{P} - \mathrm{P} + \mathrm{Q}\,\frac{\mathrm{dP}}{\mathrm{dQ}}$$

[1] This method of deriving the optimum tariff is based on J. Sloman, A. Wride, and D. Garratt, *Economics* (Pearson, Harlow, Ninth Edition, 2015), pp. 723-4. I am grateful to Ryan Das for assisting me in re-working Sloman's calculations.

$MC - P = Q \frac{dP}{dQ}$

Dividing both sides by P to get the optimal tariff rate, we have:

$$\frac{MC-P}{P} = \frac{Q}{P}\frac{dP}{dQ}$$

$$\frac{MC-P}{P} = \frac{1}{\frac{PdQ}{QdP}}$$

$\frac{P}{Q}\frac{dQ}{dP}$ is the expression for Price Elasticity of Supply when Q = f(P). But since we are assuming that P = f(Q) we re-write the formula for Price Elasticity of Supply as:

$$\frac{P}{Q}\frac{1}{dP/dQ}$$

Therefore we arrive at the following equation:

$$\frac{MC-P}{P} = \frac{1}{\frac{P}{Q}\frac{1}{dP/dQ}}$$

Which can be written:

$$\frac{MC-P}{P} = \frac{1}{\varepsilon s}$$

where εs = price elasticity of supply.

Thus, the lower is the elasticity of supply, the larger will be the optimal tariff. For example, if the elasticity of supply is 2, then the optimal tariff rate will be 1/2 = 0.5 = 50%. If the elasticity of supply is 0.5, then the optimal tariff rate will be 2 or 200%. Only when elasticity of supply is infinite (which is the standard small-economy assumption of neoclassical theory) will the optimal tariff be zero.

Statistical Estimates

Several attempts have been made to calculate optimum tariff rates for large importing economies. In 2021, Douglas Irwin and Anson Soderbery estimated that optimal tariffs for the US in the early 1930s were 17.5 per cent. An important 2011 study for the National Bureau of Economic Research by Ralph Ossa of the University of Chicago, calculated optimal tariffs for a series of countries, including the US, China, India and the EU.[1] He concluded that the optimal tariff rate for such economies averaged around 60 per cent, with welfare gains for the

[1] R. Offa, *Trade Wars and Trade Talks with Data*, NBER Working Paper No. 17347 August 2011, Revised January 2014. For a review of the evidence see F. Ferry, 'What are the Best Tariffs for the U.S.? Economists Say: From 14% to 60%' (October 2023), prosperousamerica.org.

countries concerned ranging from 1 to 4 per cent of GDP. **Table 1** summaries some of his results.

Country	Optimal Tariff Rate (%)	Net Welfare Gain as % of GDP
Brazil	56.1	1.1
China	59.3	1.8
European Union	61.3	1.9
India	54.0	1.7
Japan	59.6	4.0
United States	60.3	2.3

Table 1. Offa's Estimates of Optimal Tariff Rates and Welfare Gains from Tariffs

An optimal tariff of 60 per cent implies an elasticity of supply of imports to the large economy of about 1.7. The figures for the optimal tariff are quite high: such tariff rates are far in excess of Trump's recent 10 per cent tariff on China and even his 25 per cent tariffs on iron and steel imports. Such tariffs would raise US import prices to consumers by about 30 per cent, this cost being offset by greater domestic production and higher government revenues. Yet the net welfare gains are relatively small – in the US case, about 2.3 per cent of GDP.

Broda, Limao, and Weinstein, writing in 2007, sought to estimate the supply elasticity for an extensive sample of 12,000 traded goods.[1] They found that the median price elasticity of supply was 0.6 – which is to say, a 1 percent increase in the price of a good leads to a 0.6 percent increase in the volume of exports, which is in accordance of what optimum tariff theory predicts. Indeed, even small countries will have some influence over the price at which they import products. While this influence will be negligible in the case of homogeneous goods like oil, wheat, and natural gas, this influence is significant for differentiated goods, such as particular types or makes or brands of goods. The following table highlights the significance of America's import demand in the market for certain makes of car: there can be no doubt that if the US increases its purchases of Honda, Hyundai, Nissan, or Porsche cars it will tend to raise the price of those models.

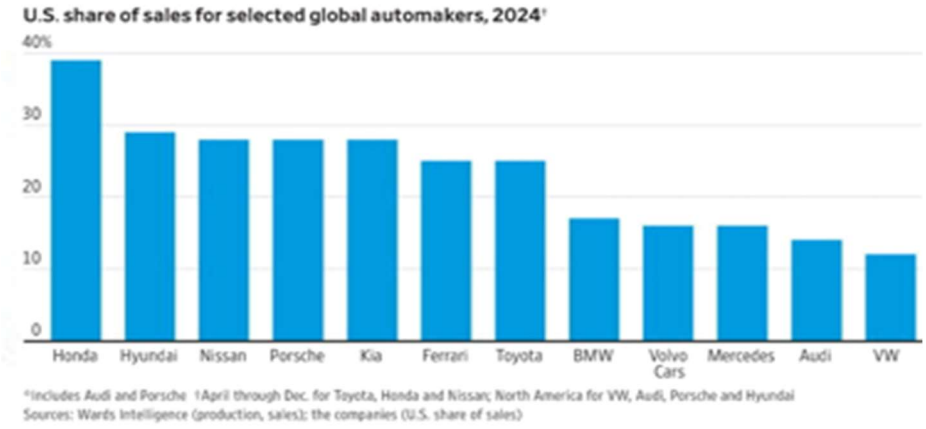

Table 2. US Demand for certain makes of car as a share of Global demand[2]

[1] Broda, Limao, and Weinstein, 'Optimal Tariffs: The Evidence', p. 33.
[2] *Wall Street Journal*, 20 February 2025.

There is a regional dimension too: while Ecuador's demand for cement may be a small part of global demand for cement, it *is* a large element in demand for Chilean cement exports. Having calculated these elasticity of supply figures, the authors then looked at the tariff policies of 15 countries who were not members of the World Trade Organisation and were thus free to set their own tariffs (including, at the time the article was written, China) in order to see whether these countries, as optimal tariff theory would predict, set higher tariffs for those goods where their market-power in purchasing was greater. Their study suggested that they *did*.

> We find that the typical country sets tariffs 9 percentage points higher in goods where it has medium or high market power relative to those with low market power. These goods represent two-thirds of each country's sample. The effect is important in 13 of the 15 non-WTO countries; in China it is 35 percentage points.[1]

Thus they conclude that non-members of the WTO 'systematically set higher import tariffs on goods in which they have market power, i.e. goods that are supplied inelastically.'[2] They found also that the United States, although subject to the WTO with regard to tariffs, still erected higher non-tariff barriers to trade on those items in which they faced the most inelastic supply lines.[3] This, say Broda, Limao, and Weinstein, emphasises the importance of WTO trading rules, since in their absence large economies like the US would almost certainly charge significantly higher tariffs – a conclusion recent events confirm.

Conclusion

Most students of economics are surprised to learn that for most reasonably-sized economies the optimum level of tariffs is positive. Economists are trained in the virtues of free-trade, and the welfare gains from trade are a core part of any introductory economics course. Yet, as with so many welfare results in economics, these gains from trade are predicated upon a world of perfect competition. If the world consisted of large numbers of small countries, each facing a perfectly elastic supply curve for imports, then an optimum tariff would indeed be zero. But, as economists increasingly recognised during the twentieth century, such results do not apply when the reality of imperfect competition is faced. One such market imperfection is monopsony.[4] A monopsony exists when the purchasing decisions of a consumer affect the market price of a good. Large firms and employers are usually monopsonists and so are large economies when they access global supply chains. As soon as this is the case, the cost to country of purchasing greater imports exceeds the market price of the traded product since the act of purchasing the product turns the terms of trade *against* the consuming country, raising its import prices relative to its export prices. In such cases the social welfare maximising level of imports will be *less than* the free-market level of imports. The degree to which this is so depends on the price elasticity of supply of the imported product. So long as the price elasticity of supply is less than infinite, then the optimal welfare maximising tariff rate

[1] *Ibid*., p. 4.
[2] *Ibid*., p. 1.
[3] *Ibid*., p. 33.
[4] For an extended treatment of the effects of Monopsony in product markets, see my 'Monopsony in Product Markets: An Economic Analysis', Haberdashers' Occasional Paper Number 67 (2023), OP67StJohnMonopsonyinProductMarkets.pdf

will be *positive*. This result is clear. As Paul Krugman and Maurice Obstfeld (both economists supportive of free-trade) acknowledge:

> Although economists often argue that deviations from free trade reduce national welfare, there are, in fact, some theoretical grounds for believing that activist trade policies can sometimes increase the welfare of the nation as a whole … It is possible … that in some cases the terms of trade benefits of a tariff out-weigh its costs, so there is a *terms of trade argument for a tariff* … The terms of trade argument against free trade, then, is intellectually impeccable but of doubtful usefulness.[1]

Intellectually impeccable but of doubtful usefulness. Why do Krugman and Obstfeld arrive at this conclusion? The reason is that, while it would be in the interest of one country to enact an optimal tariff, if many countries so acted the result would be a collective loss of the gains from trade which would damage the world economy as a whole. If other countries responded to country X's implementation of tariffs on, say, electric cars, by imposing tariffs on products country X exported to them, then this would lower the prices country X received for its products and turn the terms of trade against them. As Lerner remarked, if all countries for whom optimum tariffs were positive went ahead and imposed them, then 'the particular benefits cancel out while the general loss through the restrictions of international trade remains. If all countries persist in trying to *exploit* each other in this way, international trade would be completely destroyed with all the benefits that could have come from it.'[2] Even so, the optimal tariff remains the dominant strategy for any one country: if all other large economies forswear tariffs, then any country introducing such a tariff would gain, and if all countries implemented tariffs, any given country would be better off doing so too. To prevent this a world commitment to free trade is required; but it is just such a commitment that is lapsing in the current world economy. However ugly most economists believe tariffs to be, they can probably expect to see more of them.

[1] Krugman and Obstfeld, *International Economics*, pp. 223-24.
[2] Lerner, *Economics of Control*, p. 362.