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CAN TARIFFS BENEFIT OUR NATION?

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SUMMARY

When can adopting tariffs increase a country's welfare? President Trump imposed many import tariffs in his first term and has announced a new set of tariffs on a wider list of countries and goods in his second term. Tariffs are often used to bolster fledgling domestic industries, collect revenue for the government, and as tools in trade negotiations between countries.

Tariffs are imposed on other countries or select goods, tariffs are simply a tax on imported goods – a tax usually born by the residents of the country that imposed the tariff – in this case, U.S. citizens. However, a country as large as the United States might have the ability to push down the world price of imported goods when adopting tariffs, as long as an optimum tariff is reached. An optimum tariff is one that maximizes a country's national welfare.

In this policy paper, PERC Fellow Amy Glass discusses the conditions needed for a large country to achieve an optimum tariff, terms of trade, and changes in price due to tariffs. Trade war effects and shifts in production due to tariff avoidance are also discussed.



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CAN TARIFFS BENEFIT OUR NATION?

President Trump imposed many import tariffs (taxes on imported goods) in his first term, and appears ready to adopt tariffs on a wider list of goods and countries in his second term. Before revisiting the past as prologue, consider national welfare and broader theoretical arguments for and against tariffs.

When can adopting tariffs increase a country's welfare? Typically, national welfare is measured as the overall benefits to consumers and producers, plus government revenue collected. For a country unable to affect world prices by its trade policy, national welfare is highest with free trade. Most economists dislike import tariffs (and export subsidies) as they cause prices across affected countries to deviate from the law of one price. In the absence of distortions, the world is most efficient when producers and consumers all face the same price regardless of country - so goods are produced at minimum cost and purchased by consumers who value the goods the most. If markets work well, producers and consumers allocate resources most efficiently when governments do not interfere with market prices through any kind of trade (or other) policy.

For a country that is too small for its trade policies to affect world prices (to any meaningful degree), import tariffs simply cause the domestic price to rise by the full amount of the tariff. As a result of higher prices, buyers consume too little while firms produce too much. Consumers of imported goods are hurt, while import-competing producers gain from the higher domestic prices for imported goods. As an importing country where domestic demand exceeds domestic supply, the harm to consumers outweighs the gains to producers and any import tariff (regardless of magnitude) would hurt the country.

National welfare is harmed because domestic firms produce more than they should (start producing units that could have been purchased on world markets for less than the domestic production cost) and consumers purchase less than they should (stop consuming units that they value more than the world price but not more than the higher domestic price with the tariff). These production and consumption distortions generate an efficiency loss that clearly reduces national welfare. Since the tariff does not affect the world price, the distortions are limited to the country adopting the tariff.

Note that while politicians often seek increased employment in import-competing industries, any expansion in output (and thus employment) beyond free trade levels generates inefficiencies. The gains from trade stem from the concept that no single country should try to produce all of everything. Left unfettered, free markets tend to get decisions right.

However, a country as large as the United States might have the ability to push down the world price of imported goods when adopting tariffs. The terms of trade (TOT) is the ratio of the price of a country's exports to its imports. An increase in the TOT indicates that a country can afford more imports for every unit of exports. There can be a TOT gain from a tariff in proportion to how much cheaper imports are (multiplied by the volume of imports with the tariff). The TOT gain also serves as a measure of what portion of the tariff revenue foreign producers pay rather than domestic consumers. Tariff revenue collected is the tariff multiplied by the volume of imports subject to the tariff. The degree that the domestic price rises relative to the magnitude of

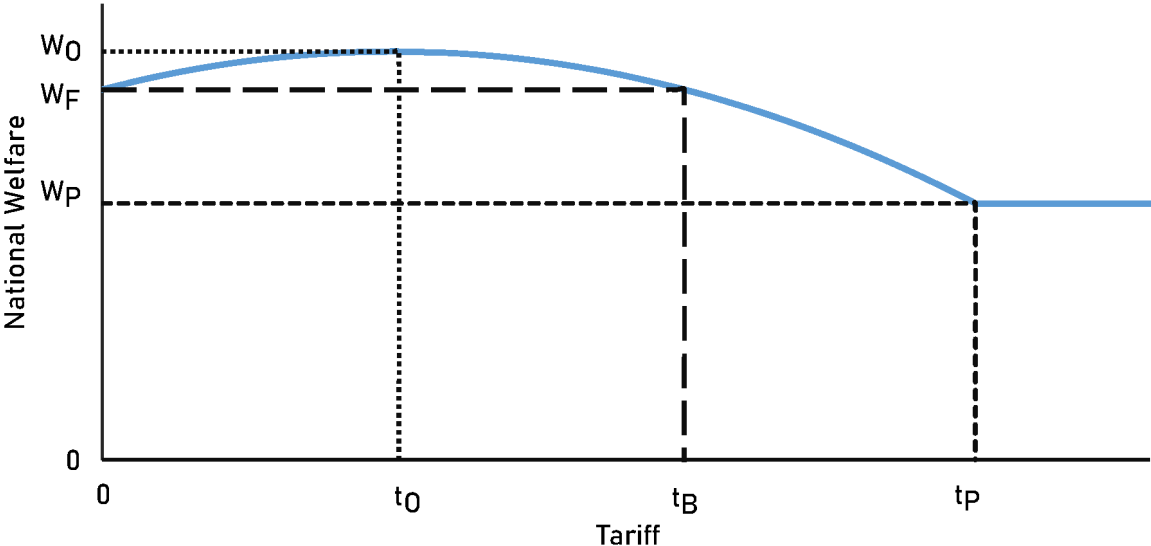
the tariff is the share of the tariff paid for by domestic consumers while the degree that the world price falls relative to the magnitude of the tariff is the share of the tariff paid for by those outside the country (i.e. foreign producers). Depending on the situation, a tariff could be paid entirely by domestic consumers, entirely by foreign producers, or any split in between.

Starting from free trade, the TOT gain dominates the efficiency losses due to production and consumption distortions so that a small tariff can actually improve a country’s welfare (relative to free trade). The net effect on the welfare for the country adopting the tariff is the TOT gain minus the efficiency loss. The more of a tariff that is paid for by domestic prices rising, the larger the efficiency losses relative to the TOT gain.

The optimal tariff is the tariff that maximizes a country’s national welfare. For a country able to affect world prices, the optimal tariff is positive. However, it must be less than the prohibitive tariff that would be high enough to choke off all imports, as there is zero TOT gain if there are zero imports. Thus, there is no national welfare argument for tariffs so high that they would prohibit imports entirely. A prohibitive tariff causes all the gains from trade to be lost. But there can be a national welfare case for a positive tariff, provided it is not too large.

Figure 1 depicts the conditions needed for an optimum tariff. Starting from a zero tariff, as the tariff increases, national welfare initially increases relative to the level under free trade W_F . Once past the optimal tariff t_0 (where national welfare reaches its maximum W_0), further increases in the tariff lower national welfare. For a while, national welfare is still higher than it would be under free trade. At the break-even tariff t_B , national welfare is same as under free trade. Once the tariff exceeds t_B , national welfare drops lower with the tariff than under free trade. This decline in national welfare due to the tariff being too large happens when the TOT gain is less than the efficiency loss. If the prohibitive tariff t_P is reached, all gains from trade are lost and national welfare falls to W_P (national welfare without any imports).

FIGURE 1. OPTIMUM TARIFF (50%)



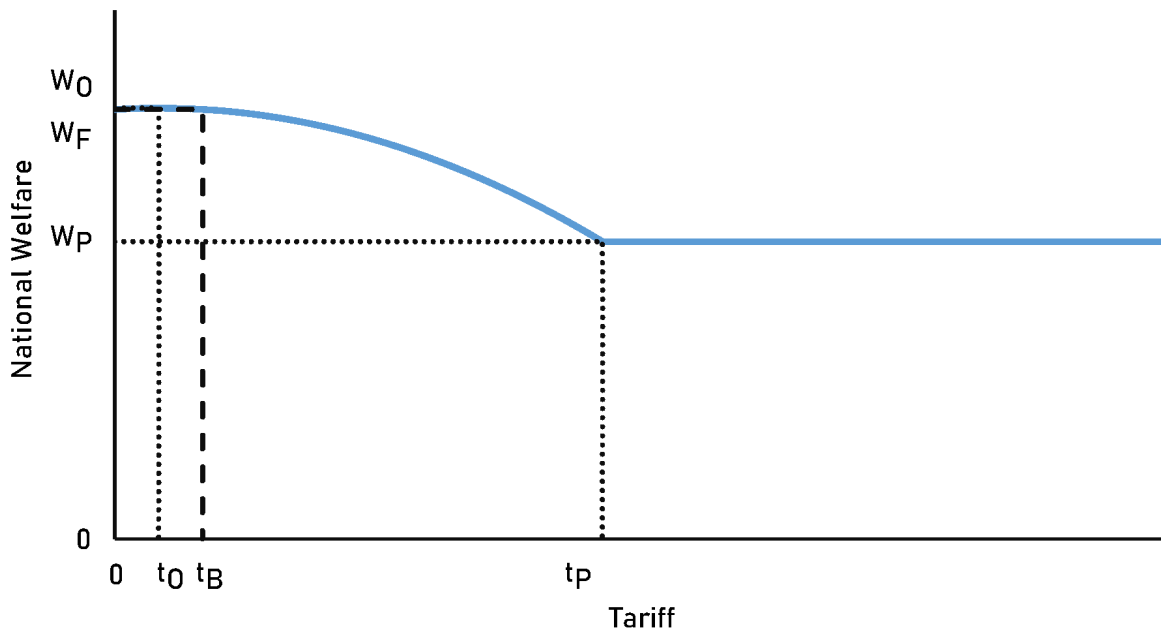
In theory, adopting the optimal tariff for each industry would raise national welfare. One problem with trying to adopt optimal tariffs is that the value of the optimal tariff is hard to know. The optimal tariff will be different in different industries. The government is unlikely to know details of how much domestic quantity demanded or quantity supplied are apt to change due to a tariff of a particular magnitude (let alone these changes in other countries). How much the tariff will raise the U.S. price versus how much the world price will fall is hard to know for a specific industry – it depends on properties of import demand and export supply on world markets (and perhaps other characteristics of the specific industry). Domestic producers will typically keep lobbying for larger and larger tariffs (since larger tariffs increase their profits through higher prices and more production) so they should not be relied on to suggest appropriate tariff rates.

In the first illustration of how national welfare might be affected by a tariff in a particular industry (Figure 1), the government might stand a good chance of guessing a tariff that benefits national welfare if it avoids values close to the prohibitive tariff. In this situation, the optimal tariff is about 1/3 of the prohibitive tariff, and from 0 to about 2/3 of the prohibitive tariff, national welfare would be higher with the tariff than under free trade. This first (optimistic) scenario assumes half of a tariff goes into the domestic price rising and the other half into the world price falling.

Studies vary slightly but suggest about 90% (or more) of recent tariffs were passed on to U.S. consumers through higher prices so U.S. consumers paid for almost all of these tariffs. Examining the evidence, claims that most tariff revenue might come from other countries appears misguided. Most economists agree that domestic consumers wind up paying most of tariffs through higher prices for the goods impacted by tariffs (Amiti et al. 2019). Even though the consumer does not literally pay the tariff, through the adjustment of domestic and world prices (the U.S. price will exceed the world price by the amount of the tariff), consumers bear the burden of most of a typical tariff. As for the remaining 10%, there is the possibility that it might be absorbed by lower profit margins of US distributors, rather than lowering the world price to get imports cheaper, so it is unclear whether foreign countries ultimately pay any of a typical tariff (Fajgelbaum et al. 2020).

Figure 2 reconstructs the optimum tariff for a case where 90% of the tariff goes into the domestic price rising and 10% into the world price falling. Now the optimal tariff is only around 1/10 of the prohibitive tariff and any tariff more than about 1/5 of the prohibitive tariff would lower national welfare. Additionally, the potential gains from adopting the optimal tariff compared to free trade are miniscule, especially compared to the potential losses in national welfare from adopting large tariffs. Guessing what tariff to pick and hoping for the best is unlikely to yield good outcomes in this more realistic scenario with only the slightest potential for TOT gains. Even this pessimistic scenario could be overstating the potential TOT gains based on recent evidence for the United States.

FIGURE 2. OPTIMUM TARIFF (90%)



Tariffs are similar to placing a sales tax in a market, in that who bears the burden of the tax does not depend on who actually pays the tax (whether the buyer or the seller is charged the tax), but rather on (relative) elasticities of demand and supply. Empirical evidence suggests that the case of tariffs is similar to where export supply is fairly price elastic, while import demand is fairly inelastic, leading to most of the tax burden for import tariffs falling on domestic consumers. Fajgelbaum et al. (2000) find nearly complete pass-through of tariffs to domestic prices. As mentioned above, estimates indicate that about \$9 of every \$10 in tariff revenue comes out of the pocket of domestic consumers, and perhaps at most \$1 from foreign firms (or intermediaries). With this 90/10 split, around \$8 billion of the \$80 billion in US tariff revenue might come from elsewhere (if not from domestic intermediaries). However, this TOT gain can have consequences in terms of risking retaliation.

The basic optimum tariff argument ignores the high likelihood that other countries will retaliate by enacting their own import tariffs. The flip side of a TOT gain for the country adopting a tariff is a TOT loss for the country (or countries) that the tariff affects. These exporting countries also suffer efficiency losses due to producing too little and consuming too much, to the degree that the tariff accomplishes pushing down the price exporters receive (net of the tariff paid). Tariffs are beggar-thy-neighbor policies because they make one country better off at the expense of others (its trading partners). The best hope to not suffer retaliation would be if the tariff did not generate much of a TOT effect, but then it would not create much of a national welfare gain.

Rare is a country that does nothing in response to being targeted by import tariffs that affect their prices. Retaliation tends to be less a question of *if* a country will retaliate but *when* (or how quickly). Retaliation can occur almost immediately. Once retaliation happens, the TOT gain is usually lost. The exporting country could retaliate less than the amount needed to undo the damage, but more commonly, retaliation amps up the trade war with a goal of taking back the TOT gain, and then some. Like a tug of war over TOT gains -- or perhaps more akin to a fist fight -- retaliation tends to cause retaliation on the retaliation. Each round creates greater and greater efficiency losses as prices deviate further and further from free trade. It is a wonder trade wars ever pause their escalation. After even just the first round of retaliation, countries often see no significant TOT gains but plenty of efficiency losses. Unfortunately, these efficiency losses are often overlooked by politicians, who see domestic production expansion as a plus and tend to not hear much about the plight of consumers paying higher prices.

Once two countries have engaged in this tariff war and imposed tariffs on each other, they are both worse off than in free trade when no tariffs were imposed. They find themselves in a situation called a Prisoner's Dilemma. Both would be better off in the original no-tariff situation, but in their new dual tariff situation, no country has an incentive to unilaterally remove its tariff. The only solution is joint action in which both countries agree to remove their tariffs, restoring the original no-tariff situation.

This property is likely a main reason why President Biden left many of the Trump-era tariffs in place – hoping to use them as bargaining chips for future negotiations. Adopting tariffs is easy, the process of reducing them is difficult.

The arguments up to now assume that markets function well enough that economic efficiency calculations using consumer and producer surplus were appropriate for measuring national welfare (and the free market outcome is best). Domestic (or even foreign) market failures could provide the basis for a case in favor of adopting a tariff. With a market failure, the usual producer surplus (and/or consumer surplus) math does not accurately gauge marginal social benefit, so that the usual economic efficiency loss calculations are misleading.

Even then, two wrongs only make a right if the tariff moves production in the needed direction. If, for example, too much of a good is being produced domestically due to firms not including pollution costs in their decisions, a tariff could make the issue worse by expanding domestic production even further. As a means of correcting market failures, tariffs are most suited for situations in which domestic production is too low, not too high.

Even so, there are more direct policy actions that could be taken in situations of market failure. Direct taxes or subsidies can deal with the market failure without creating the unintended side effects that a tariff would generate. Finally, it is unclear when, where, and to what degree market failures exist in the real world. Similar to issues about not knowing what the optimal tariff is in practice, government policies that address market failures are prone to manipulation by politically powerful groups. In this situation, there is government failure as well as market

failure. Perhaps the best summary is that tariffs are a blunt instrument for addressing issues not directly related to international trade.

Some countries that are less market-oriented, such as China, might require more sophisticated analysis than the simple national welfare approach based on consumer and producer surplus. Points on the industry supply curve usually indicate marginal costs of production, but that may not be the case to the extent a country deviates from free markets.

Unlike many politicians, economists tend to not worry about government production subsidies or anything acting like an export subsidy harming the welfare of importing countries. Similar to claims about depreciating currency to make exports cheaper, export subsidies mean other countries enjoy importing goods more cheaply. Import-competing producers will complain but should be overall welfare-enhancing for the country (unless there are low levels of competition). One such example is the Boeing-Airbus feud where the market is essentially a duopoly. If firms in a country like China are producing too much due to artificially low costs, it is not clear why the United States should intervene. Potential concerns should be more about export industries where U.S. exporters compete against Chinese firms in world markets, not import industries where U.S. firms compete against Chinese imports in the United States. However, export subsidies are guilty of creating production and consumption distortions. Free trade is still typically best for world welfare (in the absence of market failures), which is part of why export subsidies are essentially banned.

The above analysis is static in that it takes technology as given. Tariffs can have dynamic effects on innovation and on foreign direct investment (FDI). A developed country adopting a tariff can raise the relative wage of that country's labor but impede innovation and FDI, which may harm the country's overall welfare (Iwaisako & Tasnaka, forthcoming). Innovation generally involves taking a risk in hopes of securing a flow of future profits if successful. Free trade can encourage innovation by increasing the profit reward through sales to larger markets globally than if sold to only one country. The optimal tariff for a large, growing country can be zero (Naito 2012 and Ufuk et al. 2018).

Another possible benefit to imposing tariffs is as a means to increase government revenue. Governments need to raise revenue one way or another. Economists like to consider a theoretical, non-distortionary *lump sum tax* that is collected independent of wealth or income, but such a tax does not exist. A country can't charge a flat tax of, say, \$20,000 per person independent of income or wealth, as some people lack the funds to pay and such a tax is politically unacceptable. Thus, taxes must be based on income or consumption or property ownership or other observable economic transactions. That is to say, any tax being considered will create distortions. Tariffs, as taxes on imports, have the advantage of being relatively easier to enforce. Some poor countries rely on tariff revenue to a greater degree than rich countries due to not being able to collect revenue well by other means. Countries find collecting tariffs at borders that are staffed for other reasons easier than collecting employment taxes at every

workplace or sales taxes at every point of sale. (especially true when a country has a large informal economy). Constituents might tolerate tariffs better than other taxes, as the link to higher prices paid for imported goods is not as obvious as the losses from many other types of taxes (such as income taxes listed on pay stubs).

Having discussed general arguments for and against tariffs, now consider recent U.S. experience. The first Trump administration imposed some tariffs on specific goods (solar panels, washing machines, steel, and aluminum) for a large set of countries. Adopting tariffs on specific imported goods but not on others (or higher on some goods than on others) tends to be distortionary. For generating the same tariff revenue, a common 10% tariff would typically be less distortionary than say tariffs of 100% or more on a narrower range of goods (unless the government somehow has the detailed knowledge needed to determine optimal tariffs based on TOT gains by product or industry). Without concrete information to know the optimum tariff industry-by-industry, it is best to apply a uniform tariff.

Furthermore, there are impacts on other industries and factor markets. Industries protected by import tariffs expand domestic production -- the resources needed to increase output in those sectors have to come from elsewhere in the economy. If the U.S. labor market is already near to full employment, expanding production in import-competing sectors comes at the expense of lower employment in other sectors (and possibly higher wages due to tighter labor markets). There is also the pragmatic issue that industries that receive protection are apt to be picked based on political factors rather than economic ones.

Some of the targeted sectors are for intermediate goods like steel and aluminum. When the price of imported steel rises, costs rise for U.S. automakers rise, as will other firms in industries using steel as an input, such as construction and machinery. The gains to U.S. steel producers must be weighed against the damage to U.S. firms buying steel and U.S. consumers of products made with steel.

Some recent U.S. tariffs targeted specific countries (China, the European Union) and covered many different goods. Around 62% of U.S. imports from China were affected by import tariffs averaging around 16% (PIIE 2024). Targeting some countries but not others can cause inefficiencies. This is why the World Trade Organization (WTO) generally insists that all member countries face equal import tariffs (with exceptions for free trade areas and custom unions). Situations where prices vary across countries are less efficient than free trade or uniform tariffs. If a tariff targets a country (e.g. China) that has lower costs than another country that enjoys freer access to the United States (e.g. Mexico), and if the difference in tariffs is larger than the difference in production costs, production could switch from the lower cost country to a higher cost country due to the difference in tariff rates, making world production less efficient.

Targeting one country such as China (or a small number of countries) runs the risk that Chinese firms may find ways to avoid the tariffs, similar to how foreign firms often avoid anti-dumping duties. A Chinese firm might move production or just the final stage production to another

country (such as Vietnam or Mexico) that is not targeted by the U.S. tariff (or not targeted by as high of a U.S. tariff). In such situations, all that is accomplished is increasing the foreign firm's costs to some degree by making them relocate.

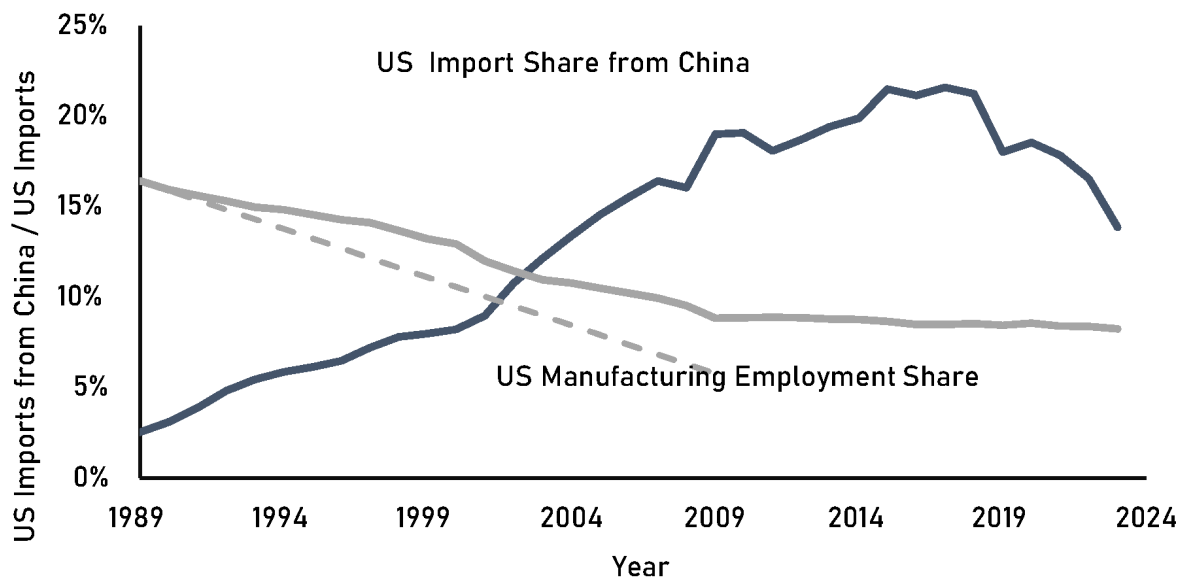
In addition to relocating production, exporters are apt to shift sales to other, more open markets. Part of why recent U.S. tariffs did not affect the price of most Chinese exports is that while China's exports to the United States fell, exports to the EU increased (Jiao et al. 2024).

The United States might target China for trade protection out of concern over declining manufacturing employment. However, U.S. manufacturing employment (as a share of non-farm employment) has been on a steady downward trend since long before China entered the WTO in 2001. This observation suggests that the root cause is more likely attributable to technological change such as the increased use of robotics rather than increased imports, per se. Figure 3 shows that the rate of decline in U.S. manufacturing employment (relative to non-farm employment) slowed slightly in 1989-2009 compared to the rate of decline for 1979-1989 (dashed line), then leveled out at a steady 8-9% since 2009. Meanwhile, U.S. imports from China (as a share of all US imports) continued to rise until reaching a maximum of 21.6% in 2017, long after the U.S. manufacturing employment share had leveled off.

The lack of clear aggregate effects could conceal more subtle effects at the level of workers or regions. Autor et al. (2013) find that increased imports can cause higher unemployment, lower labor force participation, and reduced wages in local labor markets with greater exposure due to import-competing manufacturing industries. Autor et al. (2014) find that import shocks generate labor adjustment costs and reduced earnings, impacts that varied across workers based on their skill levels and conditions of employment.

The results of these studies could hinge on the limited years examined (1990 or 1992 to 2007), a time when U.S. imports from China were on the rise, while U.S. manufacturing employment was falling. A decade earlier, U.S. manufacturing employment was falling despite minimal U.S. imports from China, and a decade later, the U.S. manufacturing employment share leveled off while U.S. imports from China were still rising. Recently, the U.S. import share from China has fallen, from 21.6% in 2017 to 13.6% in 2023, without impacting the U.S. manufacturing employment share. If a surge in imports from China were the main cause of declines in U.S. manufacturing employment, where is the rebound in the data when there was a reduction in imports from China?

FIGURE 3. US IMPORT SHARE CHINA



Another reason for targeting China with trade protection could be that China accounts for about a third of the U.S. trade deficit (\$1,063 billion in goods in 2023). Figure 4 shows that while the U.S. has been importing less from China in recent years, China has continued importing more from the United States (higher U.S. exports to China) until 2023, the most recent full year of data. The United States imported \$538 billion in goods from China in 2018 versus \$427 billion in 2023 (21% less than 2018). Some of the recent downturns could stem from U.S. firms sourcing inputs from other countries, especially if they expect the US-China trade war to escalate in 2025. However, Chinese products subject to U.S. tariffs tend to be specialized and thus hard for U.S. firms to find suitable substitutes made in other nations.

Meanwhile, China imported \$120 billion in goods from the United States in 2018 versus \$148 billion in 2023 (23% more than 2018). However, the value of China's imports from the United States for 2023 was down 4% from its peak of \$154 billion in 2022. This slight downward trend looks likely to continue for 2024 (with December 2024 trade data not available yet).

FIGURE 4. US-CHINA TRADE VOLUMES

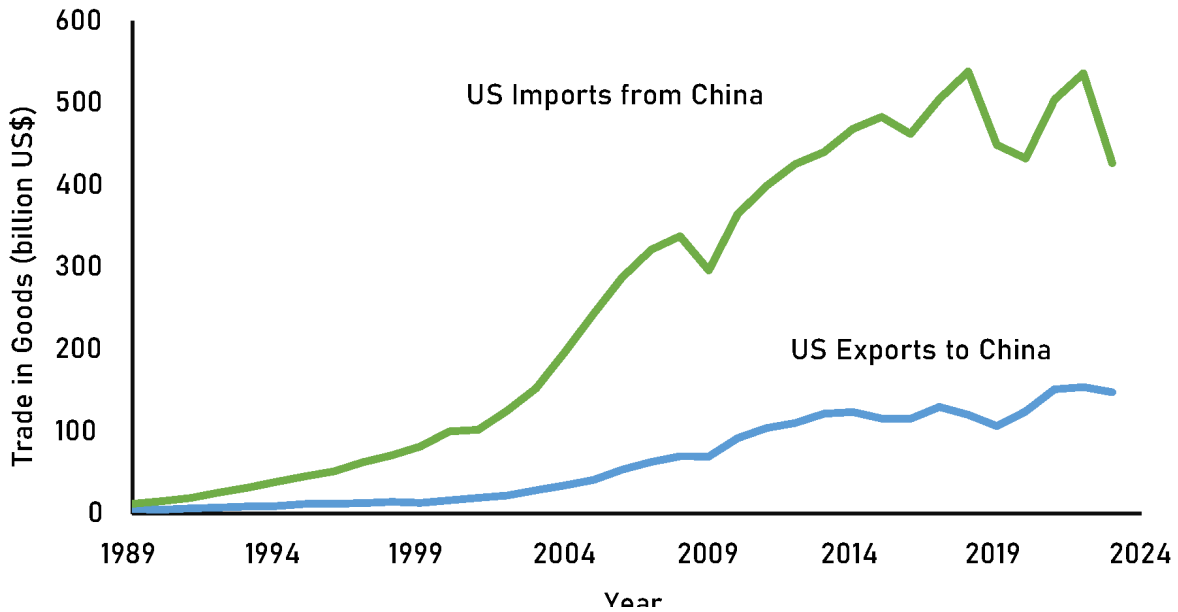
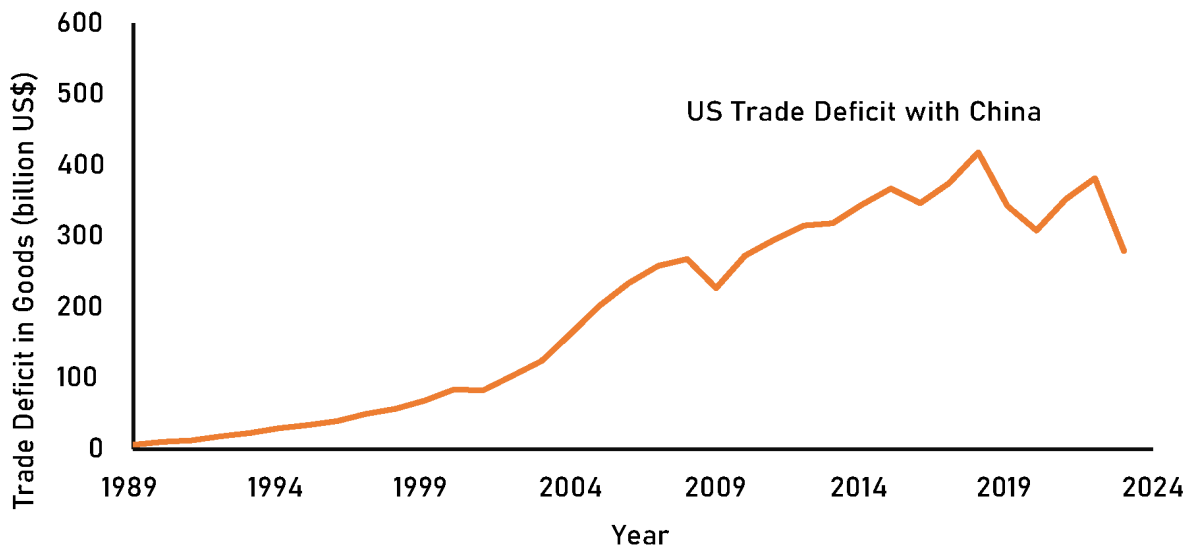


Figure 5 shows the amount that U.S. imports from China exceed U.S. exports to China, or the U.S. trade deficit with China (in goods). The U.S. trade deficit with China was clearly increasing until COVID-19 hit China in late 2019. It has since shrunk about 33%, from \$418 billion in 2018 to \$279 billion in 2023, perhaps partly due to increased trade barriers. It grew in 2021 and 2022 before shrinking in 2023. If U.S. imports from China rose slightly in 2024 and U.S. exports to China fell slightly (as likely from data through November 2024), the U.S. trade deficit with China might have grown around 6% in 2024. This trade relationship is also known as a bilateral trade deficit.

FIGURE 5. US-CHINA TRADE DEFECIT



Bilateral trade deficits can be misleading. For example, an Apple iPhone might come into the United States from China valued at around \$500 when assembling the components in China creates only a small fraction of its value (perhaps \$10 or 2%), with the rest of its value coming from Korea, Japan, the EU, and even back in the United States. Corning produces some glass screens for the iPhone in Kentucky, face ID chips are made in Texas, and Apple plans to be the top buyer at TSMC’s new fab in Phoenix. In this instance, on a value-added basis, trade deficits with China (and Mexico) would be lower but trade deficits with Japan, Korea, and the EU would be higher.

As mentioned above, new tariffs imposed by the United States inevitably led to retaliation by trading partners. China responded with higher tariffs on par with the higher tariffs imposed by the United States. Major steel and aluminum exporters to the United States responded with tariffs on various U.S. imports. These retaliatory tariffs overwhelmingly targeted agricultural products - Chinese tariffs covered virtually all U.S. agricultural exports. When the administration’s trade policies made selling many agricultural products overseas challenging, the first Trump administration gave large bailouts to U.S. farmers to lessen the harm done.

What might President Trump’s recent promises to impose a new slate of tariffs soon after he enters office mean for his second term? He has suggested perhaps a 25% tariff across the board on Mexico and Canada, which would be a major shift since ratifying the USMCA. Canada and Mexico have been the top trading partners of the United States in recent years thanks to their proximity and close to free trade.

He has also proposed tariffs on all imports of at least 10-20%. Chances are that our importing less from countries like Japan and the EU in key sectors such as chemicals, electronics and

electrical machinery, and transportation equipment will lead to retaliation and their importing less from us.

While low tariffs across the board tend to generate less in distortions than higher tariffs on a narrower set of goods, not making any exceptions could lead to problems. Most electronics such as laptops, smartwatches, and cell phones avoided the earlier U.S.-China trade war. If not exempted in this round of tariffs, prices could rise sharply, perhaps by close to the full amount of tariffs (with a 60% minimum tariff proposed against China).

One reason for choosing steeper trade restrictions is that tariffs can be an easier source of raising government revenue than other types of taxes. While revoking China's permanent normal trade relations (PNTR) status would require Congressional approval, some of the proposed protectionist trade policies potentially could be enacted through executive action. Using executive powers to impose tariffs violating the USMCA - a free trade agreement that legislation established - likely would be challenged in court and thus might wind up needing Congressional action.

Simulations suggest that Trump's tariff plans (modeled as imposing 10 percentage point additional tariffs on US imports from all countries and 60 percentage point tariffs on U.S. imports from China) will hurt U.S. GDP and employment, with or without retaliation by trading partners. Durable manufacturing and agriculture appear likely to experience the biggest hits. Higher U.S. prices could be partially offset by a stronger U.S. dollar. Even without taking into account retaliation, U.S. exports might fall due to the appreciation of the U.S. dollar and weaker foreign demand. Production moves away from China to other countries not facing such large tariff increases, rather than to only the United States (McKibbin et al. 2024). This analysis does not include the threat of a possible 25% tariff on Mexico and Canada, which could be especially damaging given how much the United States trades with these countries.

Recall that the Smoot-Hawley tariffs adopted by the US back in 1930 (and resulting retaliation by trading partners) are blamed for making the Great Depression more severe and longer lasting through reducing global trade (Crucini & Kahn 1996). What goes around, comes around. Let's hope Trump Tariffs 2.0 does not become Smoot-Hawley 2.0.

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