



What might US Withdrawal from the World Trade Organization mean for New Zealand?

Stress testing the New Zealand economy for extreme US tariff hikes

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Key points

Foreign Policy – a respected US journal- reported in May 2020 that "U.S. Effort to Depart WTO Gathers Momentum" with "lawmakers from both parties and both houses of Congress"¹ pushing for a resolution that would require a vote on US withdrawal. In this paper, we estimate the economic impact of the US raising tariffs to the Smoot-Hawley equivalent rates – the highest tariffs the US has had in the past 100 years – to approximate unilateral US withdrawal.

We modelled this using our trade simulation model – GTAP. We focused on the effects of a trade 'shock' over both the medium and long terms. Note, however this modelling does not include short-run impacts of increased uncertainty on financial markets and business confidence.

Higher tariffs reduce global economic growth and welfare...

The US imposing higher tariffs will lead to worse outcomes to the world economy, softening global GDP and reducing total world welfare.

Outcomes for the US are broadly negative, particularly in the more likely scenarios where its trading partners impose retaliatory tariffs – just as China has been doing.

... under all five scenarios

We ran five different scenarios:

- one scenario for if the world doesn't respond to the US raising tariffs
- one scenario for if all countries respond to the US in kind with the same tariffs on the same products
- three scenarios where the rest of the world responds with selective tariffs on the US that minimise the cost and consequences for their own local consumers:
 - one where we don't have a free trade agreement (FTA)
 - one where we have an FTA for animal products
 - one where we have an FTA for everything.

New Zealand emerges relatively unscathed...

New Zealand appears to sit in a sweet spot among the conflict with:

- limited impact on GDP
- positive welfare impacts in all scenarios except the least likely (Scenario 1 no retaliation by US trading partners).

https://foreignpolicy.com/2020/05/27/world-trade-organization-united-states-departure-china/

Our findings – that the longer-term effect on GDP of tariff increases are relatively small – are consistent with the findings of other researchers such as the IMF (2019). However, when the impact on trade is augmented to include off-model analysis of confidence effects, market reaction effects, and productivity effects, then tariff increases are found to have much larger impacts in the short term.

...but has little influence over its own outcomes

New Zealand remains a small player whose outcomes mostly depend on what others do, rather than on what we do ourselves. New Zealand's main indicators lift when trading partners impose their own tariffs on selective US products. However, this is likely because of trade diversion – trading partners trading less with the US and more with one another (New Zealand is included in this group).

Furthermore, New Zealand negotiating an FTA with the US makes very little difference to our GDP and welfare outcomes. The US already imposes several non-tariff trade barriers on products sent from New Zealand. These restrictions will continue to hinder New Zealand exports even if the US lowers tariffs between itself and New Zealand.

New Zealand is better off supporting global free trade

Although beyond the scope of our model, supporting a system of lower tariffs and greater global trade has several spinoff benefits for New Zealand.

Along with expanding the global 'pie' of welfare resulting from trade, greater and more inclusive trade helps small countries grow.

Furthermore, supporting greater global trade has broader implications for helping to avoid future incidences of countries raising trade barriers on New Zealand products. New Zealand may have emerged relatively unscathed in this set of simulations. But if China, Europe, Australia, or another key trading partner raised tariffs on New Zealand products (alone, or combined with outer countries), New Zealand still runs the risk of emerging a bit more bruised.

Although it is reassuring that the US could raise tariffs ten-fold and New Zealand would bear very little of the impact in these simulations, New Zealand may still be better off supporting a system that supports all countries.

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1 Introduction

The US produces around 22% of the world's GDP at constant prices (The World Bank 2019) and was the world's biggest goods importer as well as the second largest goods exporter in 2017 (UN Trade Statistics 2018). Its leader, President Trump has argued for higher tariffs on goods entering the US (Trump 2018). But as a large economy, any increase in tariffs by the US will constrain global trade and global economic growth.

New Zealand is a small trading nation and the US is our fifth largest trade partner after China, Australia, the Association of Southeast Asian Nations (ASEAN) and the European Union. Any decision by the US to raise tariffs will have a direct effect on our trade with the US and an indirect effect on our trade with other trading partners.

In this report, we assess an extreme case of what could happen if the US raises tariffs.

1.1 Stress testing for an extreme case of the US wobbles

In an extreme case, the US could reset its tariff rates to where they were during the 1930s depression and before any new free trade agreements (shown in Figure 1).

This extreme case is based on the Peterson Institute for International Economics' 2018 policy brief, where they investigate how a US withdrawal from the WTO could affect US tariff rates (Bown and Irwin 2018). In this case the US "rescinds all of the negotiated tariff reductions – known as tariff "concessions" – since the first trade agreements was reached under the Reciprocal Trade Agreements Act of 1934" (Bown and Irwin 2018, 2). These tariff settings are otherwise known as the Smoot-Hawley Tariffs of the 1930s (shown in Figure 1).

Figure 1 US trade-weighted average tariff (1820–2017)

Different global and NZ responses to the US implementing higher tariffs



Source: Bown and Irwin (2018). Calculated using Historical Statistics of the United States, Millennial Edition (New York: Cambridge University Press, 2006, series Ee424-430), updated with data from USITC Dataweb, www.usitic.gov/dataweb and authors' calculations.

1.2 Using CGE to model the impacts on New Zealand and key New Zealand trading partners

We used a computable general equilibrium (CGE) model of the global economy known as the Global Trade Analysis Project (GTAP) model (see Appendix A) to estimate the impact of this extreme case on both New Zealand, and other countries including China and the US itself.

This is a thought experiment. We have used an unlikely and very extreme set of tariffs in this analysis, with the purpose of stress testing the potential situations New Zealand could face.

Our model results show that across a range of scenarios, New Zealand would barely be affected by the US unilaterally raising tariff rates.

1.3 Modelling different trading partners and New Zealand responses using scenarios

We modelled five different scenarios of global and New Zealand responses to the US imposing Smoot-Hawley-level tariff rates (listed in Appendix B). These are as follows:

Scenario 1: Non-retaliation

Other countries do not respond to the US imposing higher tariffs. This scenario shows the pure effect of higher US tariffs on the global economy.

Scenario 2: Eye-for-an-eye retaliation

All US trading partners retaliate with equivalent tariffs on imports from the US.

Scenario 3: Selective retaliation

All US trading partners retaliate with selective tariffs on imports from the US that can be made onshore, imported from other (non-US) trading partners, or products that are already high value (and therefore the tariff take per item is high). Appendix C provides an example of how a country might retaliate to tariffs in this way.

Scenario 4: Selective retaliation + NZ-US FTA on primary goods

As with Scenario 3 but New Zealand also has a partial FTA with the US which means we pay current (instead of 1930s) tariff rates on selected agricultural products (animals, raw logs, vegetables, and oil seed).

Scenario 5: Selective retaliation + full NZ-US FTA

As with Scenario 3, but New Zealand has an FTA with the US for all exports. This FTA means that New Zealand exports have the benefit of current tariff rates with the US while the rest of the world pays the 1930s equivalent rates on goods.

Figure 2 Scenarios in stress test

Different global and NZ responses to the US implementing higher tariffs



2 Results

In this section, we present the results of our analysis of the scenarios. The results in Table 1 and Table 2 provide information on the medium term and long term effects of the five scenarios (see Appendix D). All illustrated figures are in comparison with the *status quo* ante.²

2.1 GDP impacts are small, but will accumulate over time

The impact of the tariff hikes on different countries' GDP is illustrated in Table 1. This shows the percentage change in GDP that occurs in each scenario. This change occurs each year, which means that the impacts accumulate. For example, New Zealand gains 0.03% in GDP in Scenarios 3–5. With GDP at \$61,452 per person (Statistics New Zealand 2019), each year New Zealand citizens will gain \$1,229 in Scenarios 3–5. In contrast, China loses 0.06% of annual GDP in the long run, which amounts to US\$586 per person (calculated using per capita data from the World Bank Group (2019)).

Activists lose out

The impact is negative for both the US and China in all scenarios. Our results show that the US reverting to Smoot-Hawley tariff rates will shave 0.01-0.02% off GDP each year. The impact on China is larger, with its GDP sitting 0.03–0.06% lower than what it would be each year after the US makes its move.

The theory behind this is that, an increase in tariff rates reduces efficiency in both the countries imposing the tariffs and the countries facing the new, higher tariff.³ This creates a loss in the global economy. As two major global economies, with large trade flows between them, the US and China both lose from the US jacking up its tariff rates.

Nimble bystanders do ok

For New Zealand, our model indicates that these large hikes in US tariffs will have no material impact on New Zealand's GDP if trading partners merely absorb the tariffs and don't retaliate. The result is the same if we and our trading partners retaliate with the same tariffs (Scenario 2). This is partly because some of our major potential exports already face quantity restrictions, such as quotas, and are not as sensitive to tariff changes.

Smart actors can prosper

In scenarios where other countries spurn the US by setting retaliatory tariffs that make the most out of the bad situation for themselves (Scenarios 3–5), New Zealand's GDP is set to grow. This will be because countries shift some of their demand for US products to New Zealand products, boosting New Zealand's GDP.

Even adding in an FTA with the US, won't improve New Zealand's GDP significantly. This effect may be due to the non-tariff trade barriers that the US imposes on New Zealand products – particularly on selected agricultural items.

² Standard deviations for the provided figures are not reported but will be available on request.

³ Tariffs divert both consumption and production away from the most efficient sources.

Other research points to larger effects when indirect impacts are included

The International Monetary Fund (IMF) used another CGE model, their Global Integrated Monetary and Fiscal Model, to estimate the impact of recent US tariff measures and retaliatory tariffs from other countries. They find *"while aggregate GDP effects are relatively small, they are negative for most countries"* (Carceres, Cerderio, and Mano 2019, p5). Particular regions and countries, however, faced larger spill-over effects depending upon their exposure trade flows and particular industries.

The IMF augmented this base case to include off-model analysis of confidence effects, market reaction effects, and productivity effects of the tariff increases. When these indirect impacts are included, the cumulative effect is a sharp (2%) fall in China's real GDP output in the 2020 short term but a longer-term impact of under 1% per annum, while the US takes a 0.6% hit over both the short and long terms (International Monetary Fund 2019). The analysis presented in this paper relies on the CGE modelling alone and does not include these indirect effects on markets and business confidence.

Table 1 GDP effect

Percentage change in GDP after the shock of US tariff hikes

Region	Medium term					Long term				
	S1	S2	S3	S 4	S5	S1	S2	S 3	S4	S5
New Zealand	0.00	0.00	0.03	0.03	0.03	0.00	0.00	0.02	0.02	0.02
US	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02
Australia (FTA with US)	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
China	-0.03	-0.03	-0.06	-0.06	-0.06	-0.03	-0.03	-0.06	-0.06	-0.06
Singapore (FTA with US)	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Rest of Asia	0.00	-0.01	-0.14	-0.14	-0.14	0.00	-0.01	-0.15	-0.15	-0.15
North America with FTA	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
North America	0.01	-0.06	-0.03	-0.03	-0.03	0.00	-0.05	-0.03	-0.03	-0.03
Latin with FTA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Latin	0.00	-0.01	-0.01	-0.01	-0.01	0.00	-0.01	-0.02	-0.02	-0.02
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Middle East and North Africa with FTA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Middle East and North Africa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of the world	0.00	0.00	-0.03	-0.03	-0.03	0.00	0.00	-0.03	-0.03	-0.03

Notes

1 This GDP change occurs in the year after the shock and applies every year thereafter.

Source: NZIER

2.2 Welfare effects are small relative to total welfare

Welfare changes – although sometimes in the billions of US dollars – are small relative to total welfare. Nevertheless, as with GDP, these welfare impacts occur each year and become considerable as they accumulate over time.

2.2.1 Measuring welfare changes

We have measured welfare in terms of purchasing power – how many goods and services a household can get for their income.

We also assume that the more goods and services a household can get, the better off they are. We measure how much better off households are in terms of 'utility' – an economic term for satisfaction from consuming. This utility increase is also a factor in improving wellbeing – although wellbeing is not a focus of this paper.

Both prices and incomes affect our purchasing power. If utility changes in direct correlation to prices, we can measure the increase in household welfare using real GDP. But *both* prices and household incomes change when we apply the higher tariff rates on all goods going into the US. To measure the combined impact of changes in prices and changes in incomes on utility or welfare, we use equivalent variation.

Equivalent variation measures how much 'post-shock' utility you can buy with your 'preshock' income (see Figure 3).



Figure 3 Measuring equivalent variation

Equivalent variation: How much 'after shock' utility can 'before shock' income buy?

Source: NZIER based on GDP as a Measure of Economic Well-being (Dynan and Sheiner 2018).

Once we know how much utility we get as measured in 'before shock income terms', we can compare these amounts to see whether welfare changed for the better or worse.

2.2.2 Welfare impacts

Table 2 shows the welfare impact of different scenarios. At first glance these impacts seem large – reaching into the billions of US dollars. However, total welfare is also very large. As a result, the percentage changes in welfare are relatively small (see Table 3), but we caution that, although small, these changes will accumulate over time.

New Zealand gains welfare if it too charges higher prices

The welfare impact on New Zealand is negative in Scenario 1 (no retaliation) in both the medium and long terms. However, New Zealand's welfare impact is positive in all other scenarios, especially if countries respond selectively to US tariffs (Scenarios 3–5). This is somewhat reassuring as Scenario 1 – where the US imposes tariffs and all other countries do nothing – is perhaps the least likely, while Scenarios 3–5 are more in line with what we'd expect countries to do.

The targeted tariff price settings of Scenarios 3–5 significantly boost the welfare impact for New Zealand. In the eye-for-an-eye retaliation of Scenario 2, New Zealand gains US\$22-\$27m, while in the targeted response of Scenario 3, New Zealand gains 14 times as much in welfare benefit.

New Zealand gains a small additional benefit from having an FTA (Scenarios 4 and 5) compared to Scenario 3.

The US only benefits in welfare if other countries don't respond

Our modelling has followed the approach of the Petersen Institute in assuming, as with Trans-Pacific Partnership, the US alone leaves the WTO and the no other countries follow the US lead. The impact on welfare in the US is only positive if other countries have no response to US tariff hikes (Scenario 1).

Two things happen to a country when it implements tariffs. Firstly, demand diverts to locally produced products. These are less efficiently produced and are relatively more expensive compared to the untaxed overseas option. As a result, consumers pay more for these items and therefore become worse off (welfare reduces). However, the increase in local production generates income for the local producers making them better off (welfare increases).

Generally, the downside for consumers outweighs the upside for producers. But in this case the upside for producers is slightly higher, with the relative elasticities of taxed goods tipping the scale in favour of US producers. Welfare for the US is positive in Scenario 1, at US\$1.2–\$1.6bn or 0.01% of total welfare (see Table 2 and Table 3).

In Scenario 1, US products will be just as competitive in overseas markets as before and more competitive within internal markets. However, if other countries respond by raising their own tariffs, US products lose some of their competitive edge. As a result, US households pay more for goods (the US tariff on others) and earn less from selling products overseas (other countries' tariffs on US products). In these scenarios (2–5) the US could collectively lose between US\$8.9bn and US\$36.9bn (0.3%) in welfare in the medium term.

China benefits by responding selectively

China's negative welfare gain changes to positive if China reacts to US tariffs by raising prices for key products that the US cannot get from other places as easily (Scenarios 3–5).

Table 2 Welfare impact

Level change in welfare, US \$ millions (negative figures show that 'pre-shock' income buys less 'after shock' utility than 'pre-shock' utility)

Region	Medium term Long term					Long term				
	S1	S2	\$3	S 4	S5	S1	S2	\$3	S4	S5
New Zealand	-6	27	393	394	397	-7	22	353	354	354
US	1,242	-10,874	-42,586	-42,581	-42,544	1,599	-8,902	-36,143	-36,140	-36,108
Australia (FTA with US)	5	357	1,851	1,849	1,842	-22	198	1,292	1,291	1,286
China	-3,734	-2,230	872	872	865	-3,801	-2,415	756	756	749
Singapore (FTA with US)	1	159	427	427	426	-4	127	331	331	330
Rest of Asia	-1,509	-94	-7349	-7,349	-7,356	-1,470	-406	-7,840	-7,840	-7,844
North America with FTA	531	1,691	5,141	5,140	5,136	435	1,320	3,995	3,994	3,991
North America	1	7	14	14	14	0	8	14	14	14
Latin America with FTA	300	640	1,597	1,596	1,595	270	523	1,256	1,256	1,255
Latin America	11	371	2,730	2,730	2,728	-32	483	1,961	1,960	1,960
EU	-614	2,290	7,630	7,629	7,621	-674	1,668	5,379	5,379	5,373
Middle East and North Africa with FTA	110	193	350	350	350	96	151	241	241	240
Middle East and North Africa	-102	569	1,821	1,821	1,818	-141	432	1,396	1,396	1,394
Rest of the world	38	628	842	842	840	-12	482	433	433	432

Notes

1 This level change occurs in the year after the shock and applies every year thereafter.

Source: NZIER

Table 3 Relative welfare impact

% change in welfare (negative figures show that 'pre-shock' income buys less 'after shock' utility than 'pre-shock' utility)

Region	Medium ter	m		Long term						
	S1	S2	S 3	S 4	S 5	S1	S2	S 3	S4	S5
New Zealand	0.00	0.02	0.24	0.24	0.24	0.00	0.01	0.22	0.22	0.22
US	0.01	-0.07	-0.27	-0.27	-0.27	0.01	-0.06	-0.23	-0.23	-0.23
Australia (FTA with US)	0.00	0.03	0.13	0.13	0.13	0.00	0.01	0.09	0.09	0.09
China	-0.05	-0.03	0.01	0.01	0.01	-0.05	-0.03	0.01	0.01	0.01
Singapore (FTA with US)	0.00	0.06	0.16	0.16	0.16	0.00	0.05	0.12	0.12	0.12
Rest of Asia	-0.01	0.00	-0.06	-0.06	-0.06	-0.01	0.00	-0.06	-0.06	-0.06
North America with FTA	0.02	0.06	0.17	0.17	0.17	0.01	0.04	0.14	0.14	0.14
North America	0.01	0.08	0.17	0.17	0.17	0.00	0.10	0.17	0.17	0.17
Latin with FTA	0.03	0.06	0.16	0.16	0.16	0.03	0.05	0.13	0.13	0.13
Latin	0.00	0.01	0.07	0.07	0.07	0.00	0.01	0.05	0.05	0.05
EU	0.00	0.01	0.04	0.04	0.04	0.00	0.01	0.03	0.03	0.03
Middle East and North Africa with FTA	0.02	0.04	0.07	0.07	0.07	0.02	0.03	0.05	0.05	0.05
Middle East and North Africa	0.00	0.02	0.05	0.05	0.05	0.00	0.01	0.04	0.04	0.04
Rest of the world	0.00	0.01	0.02	0.02	0.02	0.00	0.01	0.01	0.01	0.01

Notes

1 This welfare change occurs in the year after the shock and applies every year thereafter.

Source: NZIER

3 What does the WTO have to do with it?

Since coming into power, the self-proclaimed "Tariff Man", President Trump, has taken a strong stance on raising tariffs for imports into the US (Trump 2018).

However, as a WTO (World Trade Organization) member, the US has agreed to:

- treat all other WTO members the same in its tariff setting this is known as the most favoured nation treatment (MFN)
- only raise or lower tariffs within agreed bounds.

(World Trade Organization 2019)

If the US decides to raise tariffs beyond their agreed bounds, or for some members and not others, they will be breaching their agreement with the WTO.

3.1 What is the WTO?

The WTO is a group of states who have collectively agreed to reduce their barriers to trade, particularly tariffs. These countries have also agreed to treat all other members the same. This means that WTO members have agreed to keep their tariff rates low and within set bounds – that they decide – and that if they offer one member state a lower tariff rate, they offer all member states the same low tariff rates.

Effectively this means that members should not have bilateral or multilateral free trade agreements for different tariff rates with other states, but they do.

3.1.1 The WTO relies on softer tools to ensure compliance

The WTO relies on a mix of peer pressure, commitment devices (such as binding tariffs), and reputation effects to ensure members comply. Although some member states can and do flout their WTO agreements, New Zealand has used the WTO's disputes settlement process nine times – all successfully – since the WTO has been in place (Parker 2019).

However, the disputes mechanism has broken down. The US has blocked the appointment of judges to the Appellate Body which handles trade dispute appeals and settlements (Caporal 2019). This means that the top decision-making body is effectively paralysed and from December 2019 its activities are suspended, putting one of the key WTO functions out of action.

3.1.2 But the WTO still helps trade happen

The WTO has helped established widespread lower tariff rates across the globe. It is also a framework to easily apply tariff rates across trading partners without having individual agreements. Both these factors mean that trade happens at a lower cost and therefore also in higher volumes. This benefits the global economy by making goods more accessible to more people at a lower price, boosting global welfare.

3.2 Should the US stay, or should it go (from the WTO)?

The US could remain a part of the WTO and still break the rules. However, breaking the rules can be inconvenient. Recently, China has filed a complaint against the US with the WTO (Togoh 2019). Ensuing legal action costs the US and puts a negative spin on media stories about US and China trade negotiations (which in turn, dampen the stock markets).

President Trump has already talked about leaving the WTO stating that it "was the single worst trade deal ever made" and that the US will withdraw if the WTO doesn't "shape up" (BBC News 2018).

Leaving the WTO would mean that the US can make its own trade agreements. It also would mean every WTO member that trades with the US will have to make a new trade agreement.

If the US has its way and renegotiates its trade agreements to include higher tariffs on most of its trading partners, both global trade and global welfare will decline.

4 Limitations

This analysis does not account for the impact of indirect effects such as increased uncertainty that the scenarios we modelled will have on investment. Uncertainty and a breakdown of trust in a rules-based world trade order causes business to hold back on investment – restricting future growth (Caldara et al 2019). Previously in the US, manufacturers and goods' producers sought to review, postpone, or outright drop some of their previous expenditure plans in light of the US tariff hikes (Altig et al. 2008). The OECD outline that uncertainty from trade tensions have depressed investment and trade, and hence global economic growth (Boone 2019).

All modelling is highly reliant on the datasets that are used. In addition to tariffs, countries face quantitative restrictions and other non-tariff measures that act as barriers to trade. In the case of New Zealand's trade with the US, we face significant barriers for dairy products due to significant quantitative restrictions but much lower barriers for other agricultural products of interest. The data used in this study attempts to address this problem by using ad valorem equivalent tariffs for the relevant variable. More granular estimates of the equivalent tariffs imposed by quantitative restrictions may affect the results.

Furthermore, if the US leaves the WTO or simply breaches its WTO agreement to the extent we've modelled in this analysis, other countries may follow suit. Unlike what we've modelled, this outcome will involve other countries changing their tariff rates for each other – not just the US. Such scenarios would most likely give us more negative results as increased trade barriers constrain global trade and economic output. Another limitation is that this model does not account for any increases in specialisation New Zealand might adopt over time. New Zealand currently produces commodities that are largely at the early stages of a value chain. This makes us more resilient to shocks such as changes in tariff rates (Nixon 2020). If New Zealand moves towards having more integrated and more specialised value chains, we stand to gain in GDP value, but we also might become locked in to producing specific items, making us less flexible to produce different items in the face of a shock.

Despite these limitations, this analysis gives us a starting indication of the direct effects on New Zealand's trade position given the US's current role in the global trading environment.

5 Conclusion

These results highlight the longer-term consequences that New Zealand faces if the US hikes tariff rates.

New Zealand remains a small player whose outcomes mostly depend on what others do, rather than on what we do ourselves.

An FTA makes a minimal difference to New Zealand's overall economic position. Yet, how other countries respond to US tariff hikes, by shifting their demand to other countries (such as New Zealand), makes the biggest difference in New Zealand's economic position.

Our main indicators lift when New Zealand and other trading partners respond by imposing their own tariffs on select US products. This suggests that New Zealand might hope for selective tariff retaliation among its trading partners, should the US impose widespread tariffs.

Given these results and the little impact New Zealand can have on its own outcomes without enlisting other countries to make changes for our benefit, New Zealand might be better off by sticking to our traditional trade policy stance. This would involve supporting the mechanisms within the WTO and pointing out the key benefits the WTO provides to member states. Although the WTO is currently hobbled in enforcing its rules, encouraging members to stick to their agreement to keep trade barriers down will help stimulate further trade and grow economies around the world.

In supporting a world trading system that seeks lower tariffs and greater trade we can help shore up our position as an open economy while also maintaining the global GDP 'pie' for everyone, including New Zealand.



6 References

- Altig, David, Nick Bloom, Steven Davis, William H Abbott, Brent Meyer, and Nick Parker. 2008. "Are Tariff Worries Cutting into Business Investment?" Federal Reserve Bank of Atlanta. August 7, 2008. https://macroblog.typepad.com/macroblog/2018/08/are-tariff-worries-cutting-intobusiness-investment.html.
- BBC News. 2018. "Trump Threatens to Pull US out of WTO," August 31, 2018, sec. US & Canada. https://www.bbc.com/news/world-us-canada-45364150.
- Boone, Laurence. 2019. "OECD Multilingual Summaries OECD Economic Outlook, Volume 2019 Issue 1 Preliminary Version." OECDiLibrary. https://doi.org/10.1787/b2e897b0-en.
- Bown, Chad P, and Douglas A. Irwin. 2018. "Policy Brief 18-23: What Might a Trump Withdrawal from the World Trade Organization Mean for US Tariffs?" Policy Brief 18 (23): 9.
- Brockmeier, Martina. 1996. "A Graphical Exposition of the GTAP Model." 8. GTAP Technical Paper. <u>https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=311</u>.
- Caldara, Dario, Matteo Iacoviello, Patrick Molligo, Andrea Prestipino, and Andrea Raffo, "The Economic Effects of Trade Policy Uncertainty," revised November 2019, Journal of Monetary Economics, forthcoming. https://www.federalreserve.gov/econres/notes/feds-notes/doestrade-policy-uncertainty-affect-global-economic-activity-20190904.htm
- Caporal, Jack. 2019. "The Global Trade Order Going Out with a Whimper." The Regulatory Review. https://www.theregreview.org/2019/10/14/caporal-global-trade-organization-disputesettlement-system/.
- Carceres, Carlos, Diego A. Cerderio, and Rui C. Mano. 2019. "Trade Wars and Trade Deals: Estimated Effects Using a Multi-Sector Model." IMF Working Paper. International Monetary Fund. https://www.imf.org/~/media/Files/Publications/WP/2019/WPIEA2019143.ashx.
- Dynan, Karen, and Louise Sheiner. 2018. "GDP as a Measure of Economic Well-Being." Hutchings Centre on Fiscal and Monetary Policy at Brookings. <u>https://www.brookings.edu/wpcontent/uploads/2018/08/WP43-8.23.18.pdf</u>.
- Gilbert, John P. 2001. "Appendix B: GTAP Model Analysis: Simulating the Effect of a Korea-US FTA Using Computable General Equilibrium Techniques." In Free Trade between Korea and the United States, 89–118. Policy Analyses in International Economics 62. Peterson Institute for International Economics. <u>https://piie.com/bookstore/free-trade-between-korea-and-united-states</u>.
- Hertel, Thomas W., and Marinos E. Tsigas. 1996. "Structure of GTAP." In Global Trade Analysis: Modeling and Applications, 13–73. Cambridge (UK): Cambridge University Press.
- International Monetary Fund. 2019. "World Economic Outlook: Global Manufacturing Downturn, Rising Trade Barriers." Occasional paper. World Economic Outlook. International Monetary Fund.
- Nixon, Chris Land-based industries see New Zealand through tough COVID times. NZIER Insight 90 https://nzier.org.nz/publication/land-based-industries-see-new-zealand-through-toughcovid-times-nzier-insight-90
- Parker, David. 2019. "The Future of the WTO and Trade Structures." presented at the Address to the Otago Foreign Policy School, Otago Foreign Policy School, June 29. http://www.beehive.govt.nz/speech/future-wto-and-trade-structures.
- Statistics New Zealand. 2019. "Table: Series, Rolling Annuals Per Capita, Nominal, Actual, Total (Annual-Jun)." Group: National Accounts - SNA 2008 - SNE. http://archive.stats.govt.nz/infoshare/ViewTable.aspx?pxID=975a8327-e54b-40d4-a621adccdbe8b0b2.

- Togoh, Isabel. 2019. "China Files Case at WTO Over U.S. Tariffs." Forbes. September 2, 2019. <u>https://www.forbes.com/sites/isabeltogoh/2019/09/02/china-files-case-at-wto-over-us-tariffs/</u>.
- Trump, Donald J. 2018."....I Am a Tariff Man. When People or Countries Come in to Raid the Great Wealth of Our Nation, I Want Them to Pay for the Privilege of Doing so. It Will Always Be the Best Way to Max out Our Economic Power. We Are Right Now Taking in \$billions in Tariffs. MAKE AMERICA RICH AGAIN." Tweet. @realdonaldtrump (blog). December 4, 2018.
- ——. 2019. "GDP (Constant 2010 US\$) | Data.". <u>https://data.worldbank.org/indicator/NY.GDP.MKTP.KD</u>.
- World Bank Group. 2019. "GDP (Constant 2010 US\$) | Data.". https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.
- World Trade Organization. 2019. "Principles of the Trading System." https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm.
- UN Trade Statistics. 2018. "Table 41: World Exports by Provenance and Destination, Totals in U.S. Dollars (T+7 Months)." Analytical Trade Tables United Nations Statistics Division. https://unstats.un.org/unsd/trade/data/tables.asp#annualworld.



Appendix A GTAP and CGE

A.1 CGE models

To capture the economy-wide impact of world trade without the US in the WTO, we have modelled the global economy in a CGE framework. Economists use CGE models to assess trade scenarios because these models allow us to track demand and supply across many different production categories in many countries.

CGE models, including the one we used, are made up of:

- a huge database
- tens of thousands of equations representing the relationships between different variables.

One such equation could show, for example, the relationship between US tariff rates for dairy, New Zealand dairy exports to the US, New Zealand dairy exports to other countries, and New Zealand GDP. In a CGE model we have many of these sorts of equations, representing many relationships, solving simultaneously.

CGE starts with a base model

For our base case model setting, all these equations solve simultaneously based on actual historical data.

Then we 'shock' the model by changing some of the inputs

Once the base conditions are set, we 'shock' the model to see how the variables change in response. In this piece of work, our shock involves changing the tariff rates for different product categories. This creates a cascading effect in which all the equations within the model have to re-balance based on the new conditions that the shock creates, simulating how exports and imports between countries change and how that affects local GDP and welfare.

We can then assess the impacts of a 'shock' or policy change by comparing our new results to the base case.

Our model is based on many assumptions

As with all models, CGE models function on the basis of several assumptions, i.e. that everyone and every machine is fully employed. As a result, our results may represent a magnitude and direction of impact (i.e. GDP goes up by millions of dollars) but will never be wholly accurate (i.e. GDP increases by \$473m dollars). The purpose of the model is more to represent the magnitude and direction of any impact.



For a discussion on the general assumptions behind a CGE model please read "Appendix B: GTAP Model Analysis: Simulating the Effect of a Korea-US FTA Using Computable General Equilibruium Techniques" in *Free Trade between Korea and the United States* (Gilbert 2001).

A.2 GTAP model

The most well-known CGE model used for international trade relationships is the GTAP from Purdue University. We used a standard GTAP model (version 7) with GTAP 9 database for this project.

GTAP is a multiregional CGE model. This means that the GTAP model has equations for relationships within regions (e.g. spending on domestic products) and between regions (e.g. import purchases).

How households spend their income forms the basis of GTAP

Understanding how households spend their income forms the basis for how we determine the effects on any 'shock' on GDP, exports and imports, and welfare.

The GTAP model takes a representative household for each country/region and models how that household spends its income.

In the model, a household's income is 'spent' in three ways: some of this income goes towards the government, some is saved, and the rest is spent on goods and services that the household wants for themselves. These flows are shown in Figure 4.

Figure 4 Components of household demand



Source: NZIER stylised version of Brockmeier GTAP diagram (Brockmeier 1996)

GTAP models relationships within regions

In a closed economy – where people do not trade with countries overseas – income flows between the representative household and producers via the government, savings/investment systems, and private household spending (shown in Figure 5). A GTAP model has equations for all these relationships.

Furthermore, the GTAP model accounts for the compositional mix of the representative household's purchases. These purchases are constrained in the model by household income and optimised using price elasticities of demand. This optimisation is achieved through maximising the constant difference in elasticities of price and income for households (Gilbert 2001).



Figure 5 Relationships within a region



Source: NZIER stylised version of Brockmeier GTAP diagram (Brockmeier 1996)

We also assume "constant returns to scale technology and perfect competition" in this model (Gilbert 2001). "Constant returns to scale technology" means that when inputs increase, outputs increase by the proportionately the same amount. Perfect competition means that we can be consistent in assuming how producers respond to price changes.

GTAP is designed to model relationships between regions

GTAP is specifically designed to model trade relationships between economies. The representative household of New Zealand has a series of relationships and exchanges with households overseas through all these different channels (private spending, savings going to domestic producers, and government spending). GTAP models these relationships for all countries (see Figure 6).



Full documentation on the GTAP model can be found in the "Structure of GTAP" chapter of *Global Trade Analysis: Modeling and Applications* (Hertel and Tsigas 1997).

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Figure 6 Relationships between regions

Simplification – GTAP model includes all regions



Source: NZIER stylised version of Brockmeier GTAP diagram (Brockmeier 1996)



Appendix B Putting Smoot-Hawley tariffs in a 2017 context

Bown and Irwin converted the 1930s Smoot Hawley tariffs into 2017 equivalent rates, taking into account:

- the goods that exist now that didn't exist in the 1930s
- the goods that were dutiable (tariffs were applied) that are currently duty free (tariffs not applied).

To see how the Smoot Hawley rates compare to today's rates, Bown and Irwin calculated simple averages of the 1930s tariffs and 2017 tariffs by product groups (see Table 4). Overall, a simple average of US tariffs in this extreme case is 32.3%, compared to the 3.3% rate countries currently see now (Bown and Irwin 2018). We used the change in these simple averages to 'shock' our model (see Appendix A).

We have assumed these tariffs apply to all countries, except those that already have free trade agreements (for whom we have kept their current trade rates).

Product	Current tariff rate (simple average)	Smoot-Hawley equivalent (simple average)	Change in tariff
All goods	3.3	32.3	29.0
Consumer goods	4.6	35.5	30.9
Intermediate	3.0	31.0	28.0
Capital	1.4	34.3	32.9
Sector			
Animal products, live animals	2.2	5.2	3.0
Vegetable products	2.9	11.7	8.8
Animal or vegetable fats and oils	3.6	11.7	8.1
Prepared foodstuffs, beverages, spirits, vinegar, tobacco products, edible fats	6.1	20.2	14.1
Mineral products	0.2	6.4	6.2
Chemicals	2.3	29.2	26.9
Plastics and rubber	3.2	35.2	32.1
Hides, skins, leather, etc	3.5	29.1	25.6
Wood and articles of wood	1.1	17.9	16.8
Pulp of Wood, Scrap or paperboard	0.0	22.3	22.3
Textiles and textile articles	8.2	58.1	49.9
Footwear, headgear, umbrellas, feathers, etc	7.6	42.4	34.8
Stone, cement, plaster, ceramics, glassware, pearls, etc	3.0	40.2	37.2
Pearls, precious stones, etc.	2.1	28.7	26.6

Table 4 US current and potential tariffs (percentage)

Product	Current tariff rate (simple average)	Smoot-Hawley equivalent (simple average)	Change in tariff
Base metals and articles of base metal	1.5	28.4	26.9
Machinery, mechanical appliances, electrical equipment	1.2	32.9	31.8
Transportation: vehicles, aircraft, vessels	2.5	21.9	19.5
Precision instruments; optical, surgical, etc.	1.6	40.3	38.7
Arms and ammunition	1.0	45.7	44.7
Miscellaneous	2.8	43.7	40.9

Source: Bown and Irwin (2018)

Appendix C Selective tariffs example

The following is an example of how countries might choose to respond selectively to US tariffs. This example is wholly conceptual.

In this example, China wants to respond to the US tariffs selectively. One way to do this is to put a high tariff on items that the US must sell to China, but that China can buy from elsewhere. Figure 7 illustrates how China might go about responding to US tariffs by increasing tariffs on soybeans.



Figure 7 China wants to respond to the US tariffs selectively

Source: NZIER

Appendix D Medium and long term closures in GTAP

The medium and long terms are derived from two different settings for the model coming back to equilibrium. Before we shock the model, all trade throughout the global is set at an equilibrium. We then 'shock' the model with the change – in this case different tariffs rates – and the model then recalculates to find an equilibrium again over two distinct time periods.

In the medium term (approximately 1–5 years), labour can move between sectors, but the time is not long enough for new capital investment to come into effect. As endowments of productive factors (e.g. capital) are fixed, in order to maintain full employment of the resources, rate of return adjusts.

In the long term, the level of capital stock adjusts to the shock to achieve full employment of productive factors (e.g. capital). In a long term closure, the rate of return is assumed to be exogenous and returns to its initial level.

Table 5 Medium and long term effects compared

	Medium term	Long term
Rate of return to capital	Variable	Fixed
Capital stock	Fixed	Variable
New investment	No	Yes

Source: NZIER

Figure 8 Timeframes in the model



Source: NZIER