

Reference: 20160035

12 April 2016

Thank you for your Official Information Act request, received on 12 February 2016.

You requested the following:

- “- All correspondence between the Treasury and Anna Strutt (Associate Professor, University of Waikato), Peter Minor (Managing Director, ImpactECON), and Allan Rae (Professor Emeritus, Massey University)*
- All correspondence (including emails, letters, briefings, and meeting notes) between the Treasury and MFAT (and vice versa) on the “Dynamic Computable General Equilibrium (CGE) Analysis of the Trans-Pacific Agreement: Potential Impacts on the New Zealand Economy” (and its predecessor titles)*
- Any work and correspondence by the Treasury which examines the robustness or validity of the modelling undertaken by Strutt, Minor, or Rae (or their associates) in “Dynamic Computable General Equilibrium (CGE) Analysis of the Trans-Pacific Agreement: Potential Impacts on the New Zealand Economy”(and its predecessor titles).”*

On 29 February 2016 the deadline to respond to your request was extended by 25 working days.

On 23 March 2016 point two *“All correspondence (including emails, letters, briefings, and meeting notes) between the Treasury and MFAT (and vice versa) on the “Dynamic Computable General Equilibrium (CGE) Analysis of the Trans-Pacific Agreement: Potential Impacts on the New Zealand Economy” (and its predecessor titles)”* and the part of point three relating to *“correspondence”* in your request for information was transferred to the Ministry of Foreign Affairs and Trade.

## Information Being Released

Please find enclosed the following documents:

Item	Date	Document Description	Decision
1.	10/07/15	(an internal Treasury note) Non-Tariff Barriers in CGE Modelling	Release in full
2.	28/09/15	Internal Treasury spreadsheets based on MFAT model, used to calculate NPV figures in Treasury advice	Release in part

I have decided to release the documents listed above, subject to information being withheld under one or more of the following sections of the Official Information Act, as applicable:

- Details of New Zealand's negotiating positions and mandate for TPP, under Section 6(a) – to protect the international relations of the Government of New Zealand, and
- Details of New Zealand's negotiating positions and mandate for TPP, under Section 6(e)(iv) – to avoid seriously damaging the economy of New Zealand by disclosing prematurely decisions to change or continue Government economic or financial policies relating to the entering into of overseas trade agreement.

Regarding point one of your request "*All correspondence between the Treasury and Anna Strutt (Associate Professor, University of Waikato), Peter Minor (Managing Director, ImpactECON), and Allan Rae (Professor Emeritus, Massey University)*", we have interpreted this part of the request to capture any correspondence concerning TPP and TPP modelling, rather than previous correspondence Treasury has had with these people on unrelated matters.

Treasury has conducted a search of its records and I advise that there is no information relevant to your request. Consequently I must decline this part of your request under section 18(e) of the Official Information Act – that the document alleged to contain the information requested does not exist or, despite reasonable efforts to locate it, cannot be found.

In making my decision, I have considered the public interest considerations in section 9(1) of the Official Information Act.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Treasury website.

This fully covers the information you requested. You have the right to ask the Ombudsman to investigate and review my decision.

Yours sincerely

Chris Nees  
**Team Leader, International**

# 20160035 TOIA

## Information for Release

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1.	<a href="#"><u>(An internal Treasury note) Non Tarriff Barriers In CGE Modelling Note 10 July 2015</u></a>	1
2.	<a href="#"><u>Treasury TPP internal calculations based on MFAT modelling - CBA</u></a>	6
3.	<a href="#"><u>Treasury TPP internal calculations based on MFAT modelling - NPV</u></a>	7

**RESTRICTED****(an internal Treasury note) Non Tarriff Barriers In CGE Modelling Note 10 July 2015****Non tariff barriers: treatment in CGE modelling – DRAFT****Purpose:**

This note provides an overview and key points regarding NTBs in CGE modelling, drawing heavily on the following papers:

- Minor, P. (2011). Time as a Barrier to Trade: A GTAP Database of ad valorem Trade Time Costs. [Link](#)
- Fugazza et al. (2008). Non-Tariff Barriers in Computable General Equilibrium Modelling. [Link](#)

**Key points:**

- Following the global trend of tariff reduction, the relative importance of NTBs has increased
- NTBs have become a key focus of trade policy and modelling
- NTBs are wide ranging and complex, making them difficult to model
- NTBs are associated with different categories of economic effects that can impact both the supply and the demand curve
- The consensus view within the literature suggests that modelling NTBs in CGE models is still an area that requires much development. Particularly on the data calibration side, as NTB data is scarce
- NTB data is becoming more comprehensive over time (UNCTAD NTMs – [link](#)) and modelling is adapting. Eg. Webb *et al.*, (2015) – Note: preliminary document, requests non-citation – [link](#)
- At the current juncture, the approach has been to estimate an ad valorem equivalent to capture the impact of NTBs. This provides a more comprehensive picture when assessing trade agreements, but linking the quantified impact to data and therefore actual outcomes is challenging given the approach.
- The theory underpinning the ad valorem approach is that trade agreements provide a framework that naturally facilitate a reduction of NTBs between parties.
- CGE models answer the question “how do prices, production, trade, and welfare differ between equilibriums when exogenous variables are adjusted. However, they don’t do a good job of quantifying the costs and benefits associated with the transition as economic resources (labour, capital) move from uncompetitive sectors. High transition costs may cause benefits to be overstated.
- Partial equilibrium analysis on specific NTBs (and transition impacts) could complement general equilibrium analysis.

**Note:**

The accuracy of investment outcomes in CGE models is another topic subject to much debate (for similar reasons to NTBs), as it is difficult to estimate investment preferences. Generally, investment in CGE models follows the rate of return. However, other factors, such as home bias and/or asymmetric information, also impact investment outcomes. Investment outcomes in CGE models are therefore dependant on the assumptions around (or absence of) these other factors. The implications of this is that holistic robustness tests of NTB impacts in some models against FDI impacts in other models (to get a feel for total impacts) still relies heavily on model assumptions – both approaches stating a benefit that is difficult to calibrate to data

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and accurately quantify. A key risk associated with this type of comparison is that there is no way to control for modelling result bias.

**Common NTBs and their definition:**

- Technical barriers to trade: Technical barriers to trade refer to technical regulations, minimum standards and certification systems for health, safety and environmental protection and to enhance the availability of information about products, which may result in the erection of technical barriers to trade (TBTs). (OECD – [link](#))
- Sanitary and phytosanitary: The SPS Agreement is a World Trade Organisation (WTO) Agreement on Sanitary and Phyto-sanitary measures, including standards used to protect human, animal or plant life and health. (OECD – [link](#)). Phytosanitary regulations are government regulations that restrict or prohibit the importation and marketing of certain plant species, or products of these plants, so as to prevent the introduction or spread of plant pests or pathogens that these plants may be carrying. (OECD – [link](#)).

**Papers:**

Minor (2011) incorporates indirect time costs as a barrier to trade (NTB) in a CGE model under the premise that time delays occur from lack of physical infrastructure as well as administrative delays. These costs are accounted for by incorporating a variable (ams) into the demand function that shifts the demand curve by the percentage change equal to the ad valorem value of time delays. This impacts both price and quantity. In partial equilibrium, if the demand curve shifts right following a reduction in shipping time, the price will increase (terms of trade impact) and so will quantity demanded. This increases both consumer surplus and foreign producer surplus. In a CGE model, welfare is calculated across all products and regions. However, the author outlines the following caution:

*Users of the time cost data are cautioned to exercise reasonable judgments when multiplying per day ad valorem time costs against long time delays. As with any estimate in the GTAP framework, analysis is more reliable when the shocks employed are modest and considered within the context of a specific set of assumptions. As an example, if it takes thirty days to export fresh fruit from a central Asian country to the U.S., the reduction in one day to export may realistically be expected to result in no increase in export demand, because twenty-nine days of delay is still prohibitive and the general quality of the fruit after a month or more in transport is still expected to be very low. There are no empirical data to inform the user exactly when time savings become effective (threshold effects) in world markets, just as there are no exact rules to tell us when a tariff becomes prohibitive. It is reasonable to consider average global shipping times, including customs, port dwell and transportation times to identify any extreme situations, as we have indicated in the Central Asian example here.*

Consideration of the above paragraph with respect to the New Zealand case suggests that a reduction in time delays may be less significant than elsewhere in terms of exporting to distant markets such as the US and Europe. However, this will depend on the shelf life of the product being shipped.

Fugazza *et al.* (2008) analyse the impact of NTBs at a global level (opposed to a country specific level). They use estimates of ad valorem equivalents (AVE - the difference

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between world and domestic prices). The authors state that technical regulations and sanitary and phytosanitary NTBs cause a supply side impact (eg preventing the sale of hazardous to health products). Demand shifts are associated with any kind of technical regulation (eg regulation regarding information on the product). On the import side, AVEs of NTBs can be implemented to simulate either a change in taxes affecting imports or efficiency effects representing the change in the price of imports. NTBs can sometimes be thought of to behave as a tax on exports and therefore AVEs can be modelled as a change in export related taxes. The impact on government consumption will need to be controlled or accounted for, and the welfare impacts attributed to changes in the government revenues will need to be interpreted. A general finding is the very high sensitivity of welfare results to the policy variable of choice in the simulation, making policy interpretation hazardous. In particular the authors conclude:

*We find that serious estimation and modelling efforts remain to be undertaken in order to make CGE modelling a useful policy tool to analyse NTBs. Casual policy inferences from loose specifications may indeed lead to serious analytical mistakes. We show that while using the same robust estimations of NTBs incidence we obtain vastly different results under different model specifications.*

This poses the question: What serious modelling efforts have been undertaken since 2008? Is this sufficient to confidently quote CGE NTB results?

**New Zealand Specific NTBs:**

World Bank Group's DoingBusiness.org ranks New Zealand 2<sup>nd</sup> in terms of *Ease of Doing Business Rank*. However, New Zealand is 27<sup>th</sup> in terms of *Trading Across Borders*.

"Doing Business measures the time and cost (excluding tariffs) associated with exporting and importing a standardized cargo of goods by sea transport. The time and cost necessary to complete 4 predefined stages (document preparation; customs clearance and inspections; inland transport and handling; and port and terminal handling) for exporting and importing the goods are recorded; however, the time and cost for sea transport are not included". The following link provides a breakdown

<http://www.doingbusiness.org/data/exploreeconomies/new-zealand#trading-across-borders>.

While significant NTB costs are identified, New Zealand is below the OECD average.

**Acronyms:**

CGE	Computable General Equilibrium
GTAP	Global Trade Analysis Project
NTB	Non-Tariff Barrier
SAM	Social Accounting Matrices
WTO	World Trade Organisation
AVE	Ad valorem equivalent

**Q & A**

**What is a CGE model?**

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A CGE model is a system of interrelated equations that describe an economy as a whole, as well as its parts/sectors. These equations are derived from economic theory and include identities, endogenous and exogenous variables, and market clearing conditions / budget constraints. CGE models are therefore viewed as “theoretically consistent”. When the model is run it solves all equations simultaneously for the set of prices at which quantities of supply and demand are in equilibrium. Each CGE model will vary in terms of size, sector detail, endogenous and exogenous variables, as they are specified to answer different questions. To answer a specific question, the user changes one (or more) exogenous variable/s and resolves the model to quantify the impact on the endogenous variables. CGE models depict all microeconomic activity in the economy. The summation of micro-outputs determines the macroeconomic response (ie. GDP, Savings, and Consumption etc). This disaggregation also allows for sector level outcomes to be analysed, identifying winners and losers within an economy. However, CGE models are limited in their ability to quantify transition costs and/or benefits. Trade specific CGE models often utilise the GTAP database. (Burfisher, 2011).

**What is GTAP?**

The Global Trade Analysis Project (GTAP) database is a publically available resource providing core datasets required for CGE modelling. Key data include: input-output tables, bilateral trade flows, transport costs, tariff and tax information, and all data that comprise the Social Accounting Matrices (SAMs) used in CGE models. The database is updated every couple of years by researchers at Purdue University.

**What are NTBs?**

NTBs can be defined as any barrier to trade other than tariffs. Examples of NTBs include:

- Import bans
- General or product-specific quotas
- Rules of Origin
- Quality conditions imposed by the importing country on the exporting countries
- Sanitary and phytosanitary conditions
- Packaging and/or label requirements
- Product standards
- Complex regulatory environment
- Determination of eligibility of an exporting country by the importing country
- Determination of eligibility of an exporting establishment (firm, company) by the importing country.
- Additional trade documents like Certificate of Origin, Certificate of Authenticity etc.
- Employment law and/or Occupational safety and health regulation
- Import licenses
- State subsidies, procurement, trading, state ownership
- Export subsidies
- Product classification
- Quota shares
- Foreign exchange market controls and multiplicity
- Inadequate infrastructure
- "Buy national" policy
- Currency manipulation
- Intellectual property laws (patents, copyrights)
- Complex or lengthy customs procedures

**RESTRICTED****References**

Burfisher, M. (2011). Introduction to Computable General Equilibrium Models. Cambridge University Press.

Minor, P. (2011). Time as a Barrier to Trade: A GTAP Database of ad valorem Trade Time Costs.

Fugazza et al. (2008). Non-Tariff Barriers in Computable General Equilibrium Modelling.

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Scenario	A1	B1
Economic Welfare benefit (NZD)	504	2452

1948

s6(a) & s6(e)(iv)

s6(a) & s6(e)(iv)

s6(a) & s6(e)(iv)

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	0	0 discounted	8%	NPV				
2015	1	31.5	29.16666667		4062			
2016	2	63	54.01234568					
2017	3	94.5	75.01714678					
2018	4	126	92.61376145					
2019	5	157.5	107.1918535					
2020	6	189	119.1020595					
2021	7	220.5	128.6596322					
2022	8	252	136.1477589	NPV formula	\$4,062	14236	9965.51	4982.755
2023	9	283.5	141.8205822			13881	4271	
2024	10	315	145.9059487					9254
2025	11	346.5	148.6079108					
2026	12	378	150.1090008					
2027	13	409.5	150.5723002					
2028	14	441	150.1433192					
2029	15	472.5	148.9517056					
2030	16	504	147.1127957				4062	4062
	17	504	136.2155515				-14	-14
	18	504	126.1255107	504 2007 price			-34	-34
	19	504	116.7828803				-790	-790
	20	504	108.1322965				-900	-3900
	21	504	100.1224968				3224	2324
	22	504	92.70601554					-676
	23	504	85.83890328					
	24	504	79.480466					
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	66	504	3.126626539					
	67	504	2.904262907					
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	100	504	0.229115773					

Three tabs on this spreadsheet have been withheld under s6(a) & s6(e)(iv)