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AN EMPIRICAL ANALYSIS OF THE PROPOSED
AUSTRALIA-JAPAN FREE TRADE AGREEMENT

by

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Abstract

The success of the proposed Australia-Japan Free Trade Agreement will depend to a considerable degree on the manner in which it deals with the problem of agricultural trade between the two countries. This paper seeks to provide a quantitative assessment of the potential impact of an Agreement under two scenarios: full agricultural trade and no agricultural trade. We undertake simulations using the Global Trade Analysis Project (GTAP) model to estimate the effects of liberalized trade between Australia and Japan. Our results provide some preliminary indication of the magnitude of the welfare gains involved under the two trade regimes envisaged.

Key Words: Australia-Japan Free Trade Agreement; Computable general equilibrium

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1. Introduction

During his official state visit to Canberra on 9 May 2002, Prime Minister Junichiro Koizumi of Japan formally announced that Japan sought a Free Trade Agreement (FTA) with Australia and was willing to negotiate towards that end. Australian Prime Minister John Howard responded positively to this proposal. It would thus appear that a protracted period of negotiations between the two countries will now begin in order to draft a mutually satisfactory bilateral FTA. An FTA between Australia and Japan would represent part of the broader "hub-and-spokes" Growing East Asia Community strategy developed by Japan, and in this sense would augment the existing Japan-Singapore FTA. Under this strategy, Japan would cement its role as the dominant economy at the centre of Asia and strengthen its ties with surrounding nations in the Asia-Pacific region.

A critical feature of the Japan-Singapore FTA resides in the fact that the potential for agricultural imports from Singapore into Japan is minimal (Scollay, 2001). Indeed, various statements by senior Japanese foreign trade officials indicate that that the Japan-Singapore FTA represents a case of "learning-by-doing" in bilateral trade negotiations with Asian countries, with Singapore acting as a "training ground" for further preferential trading agreements, such as the proposed Australia-Japan FTA (Scollay, 2001).

The question of agricultural trade between Australia and Japan is bound to raise many difficulties, especially the problem of Australian access to the Japanese domestic market. However, with the ongoing economic stagnation of the Japanese economy, and the impetus this provides for economic reform in Japan, it surely cannot be ruled out.

Given the potential significance of the Australia-Japan FTA, this paper offers some preliminary findings on its impact on both the economies of Japan and Australia. We use a

computable general equilibrium (CGE) model developed at the Global Trade Analysis Project (GTAP) to examine the effects of trade liberalization envisaged by the proposed FTA.

The paper itself comprises six main sections. Section 2 provides a brief synopsis of the literature on trade liberalization and the light it sheds on a likely Australia-Japan FTA. Section 3 outlines the economic structure of relevant region and contrasts it with the broader global economy. Section 4 reviews the GTAP model employed for the trade simulations. Section 5 examines two trade liberalization scenarios used in the GTAP simulations; an FTA excluding agriculture and an FTA including agriculture. Section 6 analyses the results of the simulation exercises. The paper ends with some brief concluding comments in section 7.

2. Trade Liberalization and Bilateral Free Trade Agreements

After Jacob Viner's (1950) seminal demonstration that preferential trading arrangements may induce net welfare losses if the effects of trade diversion overwhelm those of trade creation, economists have long been sceptical of bilateral foreign trade treaties. A voluminous literature now exists on the theoretical analysis of FTAs (see, for instance, Bhagwati and Panagariya (1996)). Much less work has been done on the empirical analysis of FTAs, especially on the "dynamics of how these agreements have been negotiated and implemented, their impact on the pattern of trade and investment flows, their positive or negative externalities with respect to the multilateral system, their effects on the productive and investment decisions in each of the parties involved, and more generally issues regarding the political process behind the negotiating process" (Estevadeordal, 2000, p.141).

Nevertheless, a substantial empirical literature has been developed using CGE analysis, including work on Asia-Pacific Economic Cooperation (APEC) trade liberalization initiatives and its sectoral manifestations, such as the Early Voluntary Sector Liberalization (EVSL). This empirical literature has been comprehensively surveyed by both Petri (1997)

and Scollay and Gilbert (2000). In general, it appears that whatever form trade liberalization takes, it generates welfare gains, most of which stem from agriculture.

A bilateral preferential trade agreement along the lines of the proposed Australia-Japan FTA represents a legally binding agreement with the objective of bringing about closer economic integration between two countries. In terms of such an agreement, the two countries concerned undertake to provide each other with preferential access to their domestic markets for goods and services. Favourable treatment of this kind typically embraces the removal (or at least reduction) of import tariffs, the relaxation of quantitative import restrictions, and a more relaxed application of existing domestic regulations. FTAs typically also contain provisions for enhancing investment in the countries concerned and may often stress technological relationships. Agreements generally hinge on voluntarism and are "open-ended" in the sense that the ongoing nature of discussions about further trade liberalization is emphasized.

The proposed Australia-Japan FTA should be viewed in the context of recent developments in international trade in the Asia-Pacific region. Both APEC's meeting in September 1999 and the subsequent World Trade Organization's (WTO) Seattle ministerial in December 1999 struggled to find meaningful consensus amongst member countries. One consequence of faltering multilateralism has been the sharp upsurge of interest in preferential bilateral trade agreements. Scollay (2001, p.1145) has identified no less than 20 proposals for new preferential trading agreements among APEC members at various stages of negotiation. An Australia-Japan FTA would thus be a further addition to this mushrooming genre.

3. Economic Structure and Trade Pattern

Table 1 presents data on GDP, external trade, trade dependence, factor endowments, and the relative size of the economic regions included in the model. The data are remarkably

asymmetrical among regions with respect to their relative sizes of GDP, exports and imports. The economic prominence of high-income entities (NAFTA, EU, and JAP) is evident. These three regions together account for about 73 per cent of world GDP, 65 per cent of exports and 64 per cent imports. Compared to Japan, Australia's comparative size in the global economy is relatively small and one would thus expect this to carry weight in bilateral trade negotiations. Nevertheless, the trade dependence ratios reveal that Australia is a more open economy than Japan.

Table 1 Macroeconomic Characteristic of Different Regions

	NAFTA	EU	AUS	NZ	JAP	KOR	IND	TWN	MLY	PHL	SGP	THA	VIET	CHN	HGK	SAS	ROW
GDP and Trade Flows (billion US$)																	
GDP	8965.1	7958.0	392.8	65.1	4255.5	445.5	208.8	299.7	106.1	78.4	79.8	157.8	21.9	854.7	140.0	530.1	4422.5
Exports	1222.8	2454.9	71.9	17.4	506.3	162.5	56.9	138.4	96.9	41.5	131.6	71.8	9.3	241.4	54.7	69.0	1061.9
Imports	1341.8	2362.1	73.0	16.5	418.2	158.5	57.0	111.3	87.6	53.6	135.5	69.0	12.3	215.2	94.1	75.7	1127.6
Relative Size in the World (%)																	
GDP	30.9	27.5	1.4	0.2	14.7	1.5	0.7	1.0	0.4	0.3	0.3	0.5	0.1	2.9	0.5	1.8	15.3
Exports	19.1	38.3	1.1	0.3	7.9	2.5	0.9	2.2	1.5	0.6	2.1	1.1	0.1	3.8	0.9	1.1	16.6
Imports	20.9	36.9	1.1	0.3	6.5	2.5	0.9	1.7	1.4	0.8	2.1	1.1	0.2	3.4	1.5	1.2	17.6
Trade Dependence (ratio)																	
Exp/GDP	0.136	0.308	0.183	0.268	0.119	0.365	0.273	0.462	0.913	0.530	1.648	0.455	0.425	0.282	0.391	0.130	0.240
Imp/GDP	0.150	0.297	0.186	0.254	0.098	0.356	0.273	0.371	0.826	0.684	1.697	0.437	0.564	0.252	0.672	0.143	0.255
Factor Share in Value Added																	
Land	0.007	0.008	0.008	0.007	0.003	0.024	0.080	0.009	0.048	0.065	0.005	0.034	0.059	0.052	0.003	0.117	0.018
UnSkLab	0.359	0.329	0.307	0.361	0.372	0.384	0.343	0.354	0.270	0.322	0.334	0.121	0.329	0.446	0.257	0.331	0.353
SkLab	0.244	0.219	0.223	0.187	0.228	0.160	0.066	0.249	0.089	0.113	0.186	0.042	0.095	0.104	0.195	0.073	0.156
Capital	0.386	0.441	0.448	0.437	0.396	0.429	0.479	0.385	0.560	0.481	0.474	0.796	0.485	0.376	0.536	0.466	0.447
NatRes	0.004	0.003	0.014	0.008	0.001	0.003	0.032	0.003	0.032	0.019	0.001	0.008	0.031	0.022	0.008	0.012	0.026
Factor Proportions (%)																	
Skillid/Total Labour	40.4	39.9	42.1	34.2	38.1	29.4	16.2	41.3	24.8	26.0	35.8	25.7	22.4	18.9	43.1	18.1	30.7

Source: Derived from GTAP Version 5 Datatabase (Dimaranan and McDougal, 2002)

Data reported in Table 1 also point to the significance variation in factor endowments amongst regions. For example, the high-income regions are relatively abundant in skilled labour and capital in comparison to developing regions. It is also noticeable that developing regions are endowed with higher shares of unskilled labour. Australia and Japan show remarkably similar shares in unskilled labour, skilled labour and capital, although Australia is relatively better endowed with land and natural resources. Moreover, Australia has more skilled labour in the labour force (or 42 per cent) in comparison to Japan (at 29 per cent).

Figure 1:   Australia's Trade with Japan, 1985-2000
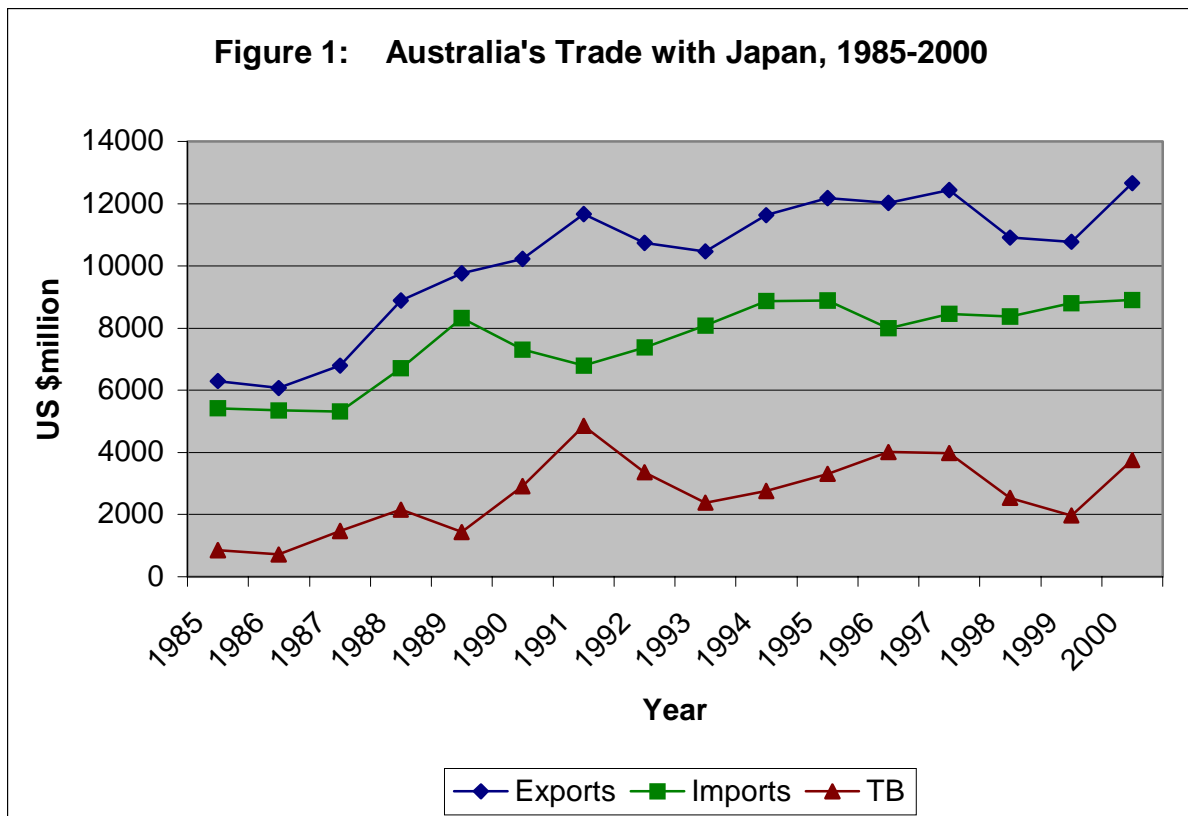
Source: Based on data from IMF, Direction of Trade Statistics Yearbook (various issues)

Figure 1 depicts Australia's trade with Japan from 1985 to 2000. Over this 16-year period, trade between Australia and Japan has shown substantial growth. Furthermore, Australian exports exceed imports throughout the period showing a significant trade surplus with Japan.

4. Characteristics of the GTAP Model

The analytical framework used to quantify the impact of bilateral tariff reductions is the well-known GTAP model (Hertel, 1996). It is a comparative-static, multi-regional CGE model of the Johansen type comprising a system of linear equations in percentage change of variables. The modelling of each region in GTAP is based on the ORANI model (Dixon *et al.,* 1982). In this paper, we employed the latest version of the GTAP model, together with version four of the database that employs 45 regions and 50 sectors in each region.

The GTAP model has a number of notable features which include product differentiation by country of origin, explicit recognition of savings by regional economies, a capital goods producing sector in each region to service investment, international mobility of capital, multiple trading regions, multiple goods and primary factors, empirically-based differences in production technology and consumer preferences across regions, and explicit recognition of a world transport sector. It also accommodates several policy variables, including taxes and subsidies on commodities and primary factors. This makes the model extremely attractive to policy economists.

In each region both factor and commodity markets are assumed to be perfectly competitive. Producers operate under constant returns to scale (CES), where the technology is described by the Leontief and CES functions. Two broad categories of inputs into production are identified; intermediate inputs and primary factors. Each regional sector is designated as choosing a mixture of inputs to minimise total cost for a given level of output. At the first level, producers use composite units of intermediate inputs and primary factors in fixed proportions according to a Leontief function. At the second level of the production nest, intermediate input composites are obtained as combinations of imported bundles and domestic goods of the same input-output class, and primary factor input composites are created as combinations of skilled labour, unskilled labour, capital, land, and natural

resources. A CES function is used in forming both types of composites. Finally, at the third level, imported bundles are created via a CES aggregation of imported goods of the same class from each region.

On the demand side, the GTAP model adopts a sophisticated specification of consumer behaviour that allows for differences in both price and income responsiveness of demand in different regions, depending on the level of development and regional specific demand patterns. Each region has a single representative household that receives all the income generated through payments to primary factors and net tax revenue. The representative household is governed by an aggregate utility function over private household consumption, government consumption and savings. The aggregate utility is modelled using a Cobb-Douglas function with constant expenditure shares. Government consumption is also described by a Cobb-Douglas function over composite commodities where the demand for the latter is a CES aggregation of imports and domestic goods. Private household consumption is explained by a CDE (Constant Difference of Elasticities) expenditure function. Households purchase bundles of commodities where the bundles are a CES aggregation of domestic goods and imported bundles. The imported bundles are then formed by a CES aggregation of imports from different regions.

Capital accumulation occurs in each region according to a technology that is similar to producing current goods, except that it requires only domestic and imported intermediate inputs. This capital creation services the investment that is financed by a global pool of savings. Each region contributes a share of its income to a savings pool at a global bank that is designed to mediate world savings and investment. Two methods are available in the standard GTAP model for allocating global savings to investment in each region. In the first place, global savings are allocated across investment in a fixed proportion to the total savings, such that the regional composition of global investment remains unaltered. The second

method allows investment to take place in each region according to the prevalent relative rates of return.

Version five of the GTAP database is used in the following empirical analysis. This version divides the world into 66 regions and each region contains 57 sectors (or commodities). Given the focus of this study, we aggregate the database into 17 regions and 20 sectors as shown in Appendix Table A1. Since our focus falls exclusively on the proposed bilateral FTA between Australia and Japan, the regional aggregation highlights the importance of other trading partners to the proposed FTA. The sectoral aggregation framework was designed to distinguish agricultural commodities (or sectors) that are important for the present analysis.

5. Trade Policy Scenarios

If a FTA is formed between Australia and Japan, then a number of changes are projected to occur in bilateral tariffs. Australia is expected to abolish all the tariff barriers (as shown in Table 2) on imports from Japan and Japan will do the same on imports from Australia. Tariffs imposed on imports sourced from other trading partners to Australia and Japan are assumed to remain unchanged. With the elimination of tariffs on bilateral basis, both the prices of Japanese goods sold in Australia and Australian products sold in Japan will fall by the amount of these import duties.

To capture the effects of Australia-Japan FTA, two simulation experiments were carried out using GTAP model and its database aggregation, as we have already discussed. The two liberalisation scenarios considered below reflect two broad options available to the proposed Australia-Japan FTA.

(i) Scenario 1: All bilateral tariffs are removed between Australia and Japan and the benefits of such liberalization are confined to the FTA. This necessarily implies

that discrimination against non-FTA countries is maintained. In this scenario, all the *ad valorem* tariff rates that appear in Table 2 will be reduced to zero.

(ii)   Scenario 2: The Australia-Japan FTA is implemented as in scenario 1, excluding agricultural commodities. This implies that commodities 1 to 5 in Table 2 are subject to import duties as usual while remainder of the commodities are imported free of duty on bilateral basis[1].

Table 2: Ad Valorem Tariffs on Different Commodities on Bilateral Basis

	Australian tariifs on imports from Japan (%)	Japanese tariffs on imports from Australia (%)
1 Grains	0.8	236.8
2 Vegetable and fruits	2.0	66.0
3 Other crops	2.7	7.3
4 Livestock	0.6	39.5
5 Forestry and fishing	0.7	2.6
6 Mining	0.0	0.0
7 Food manufactures	5.5	79.9
8 Beverages and tobacco	9.2	16.2
9 Textile and leather	15.3	2.2
10 Wood and paper	3.7	0.2
11 Petroleum and other minerals	4.6	1.4
12 Chemicals	5.9	1.6
13 Basic metals	4.8	0.2
14 Fabricated metal products	5.8	0.2
15 Other manufactures	4.1	0.3
16 Utilities	0.0	0.0
17 Construction	0.0	0.0
18 Trade, transport, communication	0.1	0.0
19 Private services	0.1	0.0
20 Public services	0.0	0.0

Source: Derived from Version 5 GTAP database (Dimaranan and McDougall, 2002)..

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[1] This sort of practice with an FTA is somewhat controversial since it violates the GATT/WTO Article 24, Clause 8(b). This Article holds that "within an FTA, customs tariffs and other restrictive trade rules and regulations should essentially be abolished for substantially all sectors". However, some FTAs have not adhered to this rule strictly. For example, the recently implemented Indo-Lanka FTA has adopted a negative list, excluding some agricultural products (Siriwardana, 2001).

The GTAP model allows for different scenarios concerning factor markets and macroeconomic closure. The tariff simulations using the GTAP model reported in this paper were conducted within a long-run framework. Rates of return are equalised across regions, with capital mobility taking place across regions. Investment occurs in each region during the period of tariff reduction thus ensuring that sum of the regional investment matches with the changes in the global savings. Unlike in the standard long-run closure of GTAP, wage rates are fixed exogenously and the supply of labour is endogenised. The theoretical rationale for this is that unemployed labour can be drawn on by industries in the event of increased production with trade liberalisation.

6. Simulation Results

The trade policy scenarios examined in this paper deal with full liberalization of Australia-Japan trade and partial liberalisation where trade in agricultural goods between Australian and Japan are subject to import duties at the existing rates. On the basis of GTAP model simulations, this section reports the results that provide the estimated effects of the bilateral trade liberalisation on important macroeconomic variables, industry outputs, and economic welfare. In order to distinguish the outcomes of exclusion of agricultural trade from proposed FTA, the results are presented under the two different scenarios outlined earlier. In particular, it is important to determine whether high Japanese tariff barriers on agricultural imports under option (ii) make economic sense when it comes to negotiating an FTA with Australia. From the perspective of Japanese trade negotiators, these findings will have momentous policy implications.

Full Trade Liberalisation Scenario

The macroeconomic effects of an Australia-Japan FTA in its full liberalization form are shown in columns (1)–(6) in Table 3. Several important points emerge from these projections. The removal of tariffs between Japan and Australia leads to a substantial increase (14 per cent) in real GDP of Australia. Whereas Australia appears to be the outright gainer in terms of GDP, Japan emerges as a marginal looser (0.58 per cent) from the FTA. Except for New Zealand, all other non-member regions experience a small fall in their real GDP as a result of the Australia-Japan FTA. Since non-members are discriminated against under the proposed FTA, trade diversion has a negative impact on their economies.

The tariff policy reforms under the proposed FTA bring about substantial changes in trade performance in Australia compared to Japan. Australian exports are projected to grow by 12 per cent and imports to increase by about 17 per cent. This will still leave a trade surplus for Australia that is estimated to be around US$ 735.5 million. Australia observes a 5 per cent improvement in terms trade: this explains its remarkable increase in real GDP as a result of the full implementation of the FTA. By contrast, Japan is projected to experience a trade deficit (around US$ 2536.3 million) and its exports and imports are expected to increase by 0.9 per cent and 1.1 per cent respectively. Unlike Australia, the terms of trade for Japan deteriorate by about 0.5: this is probably responsible for the small loss in real GDP.

Table 3: Macroeconomic and Trade Performance Results of Australia-Japan FTA

	Full Trade Liberalisation Scenario						Trade Liberalisation Excluding Agriculture Scenario					
	Real GDP	Terms of Trade	Export Volume	Import Volume	Trade Balance (US$ million)	Equivalent Variation (EV) (US$ million)	Real GDP	Terms of Trade	Export Volume	Import Volume	Trade Balance (US$ million)	Equivalent Variation (EV) (US$ million)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NAFTA	-0.28	-0.04	-0.25	-0.32	735.28	-23185.5	-0.21	-0.01	-0.18	-0.22	673.9	-17132.5
EU	-0.11	0.00	-0.09	-0.12	605.5	-7652.6	-0.10	0.00	-0.09	-0.11	463.63	-7254.4
AUS	14.42	5.14	12.34	16.83	735.52	54803.6	12.33	1.83	12.36	13.99	149.97	44670.6
NZ	0.78	-0.05	0.64	0.48	26.45	447.4	0.34	-0.02	0.33	0.25	14.69	194.3
JAP	-0.58	-0.57	0.95	1.16	-2536.34	-23205.2	-0.40	-0.15	0.81	1.19	-1519.06	-15332.0
KOR	-0.23	-0.03	-0.29	-0.33	-3.14	-949.8	-0.25	-0.02	-0.28	-0.29	-26.44	-1006.7
IND	-0.27	-0.24	-0.53	-0.84	43.71	-641.0	-0.22	-0.11	-0.37	-0.50	9.63	-474.4
TWN	-0.35	-0.03	-0.35	-0.37	-100.59	-1009.6	-0.32	-0.03	-0.32	-0.34	-92.52	-923.9
MLY	-0.19	-0.02	-0.30	-0.35	7.34	-201.8	-0.11	-0.02	-0.17	-0.20	-5.52	-121.7
PHL	-0.21	-0.07	-0.32	-0.37	32.89	-185.4	-0.20	-0.04	-0.25	-0.29	29.02	-158.1
SGP	-0.13	-0.02	-0.12	-0.14	6.86	-114.8	-0.09	-0.01	-0.10	-0.10	6.32	-74.8
THA	-0.44	-0.11	-0.50	-0.58	-39.73	-684.8	-0.41	-0.12	-0.46	-0.52	-53.64	-650.3
VIET	-0.37	-0.02	-0.47	-0.49	13.75	-74.3	-0.47	-0.07	-0.51	-0.56	14.82	-97.5
CHN	-0.20	-0.08	-0.31	-0.37	-108.36	-1712.0	-0.17	-0.05	-0.25	-0.28	-132.21	-1418.1
HGK	-0.16	-0.01	-0.14	-0.18	77.59	-212.8	-0.15	-0.01	-0.14	-0.16	70.98	-198.9
SAS	-0.14	-0.22	-0.45	-0.72	63.49	-831.6	-0.14	-0.11	-0.29	-0.41	28.47	-731.6
ROW	-0.15	-0.02	-0.13	-0.18	439.77	-5951.4	-0.13	-0.01	-0.12	-0.16	367.98	-5139.2

We now turn to the estimated welfare changes from the GTAP simulations. Column (6) in Table 3 outlines the equivalent variation (EV) in dollar terms. The EV is an absolute monetary measure of welfare improvement in terms of income that results from the fall in import prices when tariffs are reduced or eliminated. The estimated EV seems to follow the same pattern as changes in real GDP for Australia and Japan. As shown in Table 3, Australia is expected to have a significant welfare gain due to the FTA whereas Japan is likely to face a considerable loss in welfare. The welfare decomposition reported in Table 5 highlights the causes of welfare changes in response to tariff elimination under the FTA. Australia's gain in welfare is largely due to the endowment effect and the improvement in allocative efficiency followed by the terms of trade effect. The endowment effect dominates the welfare outcome for Australia accounting for the employment gain (see Table 4) resulting from trade liberalization. The negative impact on the welfare of the Japanese economy largely stems from the endowment effect. Unlike in Australia, there is a positive capital goods effect in Japan. This is similar to the terms of trade effect: it measures the price of purchasing capital goods at home relative to the price of savings in the world market. It is also important to note the significant influence of the allocative efficiency and terms of trade effects in reducing welfare in Japan.

The results reported in Table 4 (columns 2-4) may be seen as factor market adjustments in response to bilateral tariff elimination. From Australia's perspective, with free trade under the FTA, demand for both skilled and unskilled labour and capital will increase in line with the rise in real GDP. The converse is true in the case of Japan where demand for all three inputs declines by a small percentage.

Table 4: Changes in Demand for Capital and Labour

Region	Full Trade Liberalisation Scenario			Trade Liberalisation Excluding Agriculture Scenario		
	Unskilled labour (1)	Skilled labour (2)	Capital (3)	Unskilled labour (4)	Skilled labour (5)	Capital (6)
NAFTA	-0.29	-0.28	-0.28	-0.21	-0.21	-0.21
EU	-0.11	-0.11	-0.11	-0.10	-0.11	-0.10
AUS	15.56	15.33	14.4	13.12	12.98	12.37
NZ	0.80	0.79	0.76	0.34	0.35	0.34
JAP	-0.66	-0.54	-0.63	-0.41	-0.38	-0.41
KOR	-0.25	-0.25	-0.23	-0.25	-0.26	-0.24
IND	-0.24	-0.31	-0.34	-0.23	-0.23	-0.26
TWN	-0.35	-0.36	-0.35	-0.32	-0.33	-0.32
MLY	-0.17	-0.22	-0.22	-0.11	-0.13	-0.12
PHL	-0.22	-0.26	-0.22	-0.20	-0.23	-0.21
SGP	-0.13	-0.14	-0.12	-0.10	-0.10	-0.09
THA	-0.50	-0.49	-0.44	-0.51	-0.46	-0.40
VIET	-0.47	-0.48	-0.37	-0.57	-0.59	-0.47
CHN	-0.20	-0.21	-0.21	-0.18	-0.18	-0.17
HGK	-0.16	-0.17	-0.16	-0.16	-0.16	-0.15
SAS	-0.10	-0.19	-0.17	-0.13	-0.17	-0.16
ROW	-0.15	-0.16	-0.14	-0.13	-0.14	-0.13

Table 6 reports the sectoral output responses to the FTA being implemented in its full bilateral tariff elimination form between Australia and Japan. As tariff barriers disappear, Australia is likely to experience substantial structural changes in terms of sectoral outputs in comparison to Japan. Except for the "Other Crops" sector, all other sectors increase their outputs in Australia. The most significant increases in outputs are recorded in "Grains" (80.7 per cent), and "Food Manufactures" (37.8 per cent). In essence, many sectors in the Australian economy experience a balanced stimulation from free trade with Japan. While this is undoubtedly good news for Australia, the output changes at sectoral level for Japan are consistently negative, although the magnitudes of change are quite small in comparison to Australian industry responses. Only Japanese sector that has experienced an increase in output is "Vegetables and Fruit".

Table 5: Decomposition of the Welfare Effects of the Japan-Australia FTA (US$ million)

	Full Trade Liberalisation Scenario					Trade Liberalisation Excluding Agriculture Scenario				
	Allocative Efficiency (1)	Endowment Effect (2)	Terms of Trade Effect (3)	Capital Goods Effect (4)	Equivalent Variation (EV) (5)	Allocative Efficiency (6)	Endowmen Effect (7)	Terms of Trade Effect (8)	Capital Goods Effect (9)	Equivalent Variation (EV) (10)
NAFTA	-123.9	-22558.5	-432.3	-70.8	-23185.5	-289.6	-16748.2	-69.8	-25.0	-17132.5
EU	-997.1	-6576.3	-117.4	38.1	-7652.6	-892.6	-6313.6	-58.2	10.0	-7254.4
AUS	5058.8	45760	3987.6	-2.7	54803.6	4344.5	38924.2	1404.9	-3.0	44670.6
NZ	64.9	388.7	-6.2	0.0	447.4	28.1	168.2	-1.8	-0.1	194.3
JAP	-2065.1	-18703.4	-2516.9	80.2	-23205.2	-2517.1	-12166	-685.6	36.7	-15332
KOR	-96.6	-804.4	-49.7	0.8	-949.8	-156.2	-814.3	-36.2	-0.1	-1006.7
IND	-17.3	-487.2	-136	-0.4	-641	-12.7	-398.8	-62.7	-0.3	-474.4
TWN	-96.7	-885.1	-38.6	10.9	-1009.6	-86.3	-810.1	-29.7	2.2	-923.9
MLY	-26.8	-153.8	-21.4	0.2	-201.8	-15.7	-89.5	-16.9	0.4	-121.7
PHL	-23.8	-124.6	-30.1	-6.9	-185.4	-19.7	-115.4	-19.7	-3.3	-158.1
SGP	-10.4	-79.2	-23.1	-2.0	-114.8	-8.6	-57.3	-8.2	-0.7	-74.8
THA	-89.8	-515.8	-80.4	1.2	-684.8	-87.4	-478.5	-84.7	0.4	-650.3
VIET	-11.4	-61.0	-1.6	-0.4	-74.3	-15.1	-76.0	-6.7	0.4	-97.5
CHN	-397.7	-1155.1	-180.2	13	-1720	-289.2	-1008.3	-126.2	5.6	-1418.1
HGK	-0.9	-193.8	3.8	-21.9	-212.8	-0.7	-185.7	-3.5	-9.0	-198.9
SAS	-147.6	-516.8	-163.5	-3.6	-831.6	-118.4	-531.2	-80.5	-1.6	-731.6
ROW	-815.0	-4899.3	-201.4	-35.7	-5951.4	-661.0	-4350.3	-115.3	-12.6	-5139.2

These rather one-sided sectoral gains arising from the FTA may appear quite disturbing to the Japanese trade policy makers. Contrary to any expectation that the FTA would allow Japan to exploit its gains from comparative advantage under free trade with Australia, the projections from the GTAP model indicate that Japan is likely to undergo very minor structural adjustments in comparison to Australia.

Trade Liberalisation Excluding Agriculture Scenario

The aforegoing analysis of results from the GTAP model simulations clearly suggest that an Australia-Japan FTA is potentially more beneficial for Australia compared to Japan. The bleak picture painted by the projections for Japan could raise many questions that may require carefully considered answers. In particular, the role of agriculture and any associated level of protection afforded it is surely a major concern in the liberalization process. After all, Japanese farmers have consistently opposed agricultural trade liberalization (Scollay, 2001).

In our analysis we have also attempted to compute the potential outcome if an Australia-Japan FTA is implemented without liberalising agricultural trade between Australia and Japan. This serves to provide a preliminary estimate to policy makers who may be concerned with the political ramifications of complete free trade between the two nations. Will Japanese farmers be better off by not allowing free market access for Australian agricultural exports in Japan? The macroeconomic consequences of moving from full bilateral free trade to partial free trade, where agricultural goods trade is excluded from the proposed FTA, are depicted in columns (7)-(12) in Table 3.

The immediate outcome of this is quantified in the GDP projection. Australia's gain in GDP under full free trade is lowered from 14.4 per cent to 12.3 per cent whereas Japan's GDP loss falls from 0.58 per cent to 0.4 per cent. The net position of Japan thus does not seem to improve much by removing agricultural trade from the proposed FTA. The most noticeable change for Australia is the substantially reduced terms of trade improvement (from

5.1 to 1.8 per cent) and the associated trade outcome. Consistent with the terms of trade effect, Australia is likely import less than before and the projected trade surplus appears to be

Table 6: Changes in Sectoral Outputs Due to Japan-Australia FTA with Full Liberalisation (percentage changes)

Sector	NAFTA	EU	AUS	NZ	JAP	KOR	IND	TWN	MLY	PHL	SGP	THA	VIET	CHN	HGK	SAS	ROW
Grain	-2.55	0.07	80.66	0.29	-17.55	-0.33	0.28	-0.92	0.21	-0.23	6.22	-0.81	-1.91	0.13	0.23	0.27	-0.05
VegFruit	0.24	-0.17	2.04	0.77	0.46	-0.04	-0.25	-0.05	0.17	-0.43	1.23	0.03	1.32	-0.32	0.31	-0.01	-0.15
OthCrops	1.03	-0.04	-2.44	1.42	-0.96	0.25	-0.01	0.96	-0.42	-0.05	-0.29	0.00	1.16	0.19	-0.22	-0.12	-0.03
Livestock	-0.06	0.26	11.41	1.10	-0.70	-0.59	0.49	-0.92	0.12	1.05	0.02	-0.56	0.34	-0.07	0.21	0.02	0.01
ForFish	-0.25	-0.08	5.84	0.19	-0.47	-0.18	-0.20	-0.04	-0.09	-0.13	-0.18	-0.39	-0.57	-0.23	0.05	-0.18	-0.15
Mining	-0.09	-0.03	1.05	0.87	-0.19	-0.07	0.08	-0.06	0.01	-0.04	-0.01	-0.13	0.28	-0.06	-0.11	-0.03	-0.02
FoodMnfcs	-0.32	-0.12	37.77	-0.81	-1.55	-0.86	-1.03	-1.14	-1.04	-0.23	-0.95	-2.04	-2.98	-0.87	-1.45	-0.70	-0.25
BevTobac	-0.18	-0.05	7.00	1.18	-0.17	-0.19	-0.39	-0.31	-0.20	-0.22	-0.26	-0.25	-0.10	-0.17	0.07	-0.19	-0.12
TexLeath	-0.13	-0.06	3.17	1.60	-0.16	-0.12	-0.14	-0.36	-0.28	-0.24	-0.06	-0.32	-0.09	-0.05	-0.11	-0.15	-0.10
WoodPap	-0.26	-0.08	14.32	1.75	-0.55	-0.23	-0.03	-0.31	-0.02	-0.12	-0.03	-0.39	-0.15	-0.18	-0.11	-0.2	-0.16
PetMin	-0.24	-0.11	13.16	0.64	-0.51	-0.27	-0.32	-0.41	-0.20	-0.21	0.02	-0.40	-0.40	-0.20	-0.07	-0.21	-0.15
Chemicals	-0.23	-0.07	12.25	1.39	-0.41	-0.19	-0.24	-0.25	-0.64	-0.24	-0.04	-0.13	-0.34	-0.15	-0.16	-0.14	-0.13
BasicMetal	-0.22	-0.12	3.33	1.46	-0.02	-0.14	-0.10	-0.23	-0.15	-0.16	-0.01	-0.17	-0.39	-0.16	-0.03	-0.2	-0.13
FabrMetals	-0.26	-0.14	9.78	0.96	0.00	-0.22	-0.34	-0.25	-0.24	-0.23	-0.15	-0.32	-0.39	-0.19	-0.22	-0.21	-0.17
OthMnfcs	-0.22	-0.13	6.91	3.94	-0.25	-0.27	-0.19	-0.28	-0.26	-0.16	-0.20	-0.24	-0.28	-0.18	-0.25	-0.20	-0.17
Utilities	-0.26	-0.10	13.07	0.87	-0.53	-0.23	-0.31	-0.34	-0.24	-0.20	-0.15	-0.49	-0.46	-0.2	-0.17	-0.11	-0.14
Constr	-0.31	-0.15	14.79	0.71	-0.55	-0.26	-0.38	-0.38	-0.27	-0.24	-0.15	-0.46	-0.44	-0.22	-0.18	-0.20	-0.18
TraTranCom	-0.28	-0.10	14.76	0.66	-0.58	-0.22	-0.38	-0.35	-0.22	-0.27	-0.13	-0.40	-0.45	-0.19	-0.14	-0.20	-0.16
PrivSvces	-0.28	-0.11	15.35	0.74	-0.66	-0.24	-0.39	-0.37	-0.19	-0.19	-0.11	-0.40	-0.36	-0.21	-0.16	-0.20	-0.16
PubSvces	-0.30	-0.12	16.4	0.83	-0.69	-0.27	-0.33	-0.38	-0.20	-0.31	-0.17	-0.53	-0.45	-0.24	-0.19	-0.19	-0.17

Table 7: Changes in Sectoral Outputs Due to Japan-Australia FTA with Trade Liberalisation excluding Agriculture (percentage changes)

Sector	NAFTA	EU	AUS	NZ	JAP	KOR	IND	TWN	MLY	PHL	SGP	THA	VIET	CHN	HGK	SAS	ROW
Grain	-0.17	0.02	-0.25	-0.37	-2.26	-0.38	-0.29	-0.71	-0.06	-0.25	1.45	-1.31	-2.27	-0.17	-0.19	0.02	-0.04
VegFruit	-0.15	-0.09	-0.78	0.66	-0.10	0.03	-0.09	0.04	0.05	-0.14	0.51	0.15	0.82	-0.24	0.11	-0.04	-0.10
OthCrops	0.07	-0.07	4.07	0.91	-0.78	0.21	0.25	0.39	-0.05	-0.16	-0.11	0.11	1.53	0.14	0.02	-0.07	-0.02
Livestock	-0.30	0.10	24.29	0.39	-2.37	-0.69	0.34	-0.72	0.07	0.46	0.03	-0.73	0.39	-0.06	0.10	0.00	-0.06
ForFish	-0.27	-0.08	5.40	-0.01	-0.89	-0.23	-0.16	-0.09	-0.11	-0.12	-0.13	-0.40	-0.65	-0.22	0.02	-0.16	-0.17
Mining	-0.05	-0.01	0.96	0.71	-0.08	-0.05	0.09	-0.04	0.03	0.00	0.02	-0.11	0.25	-0.03	-0.10	-0.02	0.00
FoodMnfcs	-0.49	-0.16	51.52	-1.32	-3.23	-0.98	-0.85	-1.39	-0.84	-0.35	-1.22	-2.12	-3.13	-0.89	-1.51	-0.63	-0.29
BevTobac	-0.18	-0.09	9.35	0.50	-0.20	-0.19	-0.26	-0.27	-0.12	-0.23	-0.19	-0.24	-0.27	-0.13	-0.08	-0.14	-0.11
TexLeath	-0.15	-0.08	5.08	1.20	-0.07	-0.16	-0.06	-0.35	-0.14	-0.18	-0.06	-0.22	-0.08	0.00	-0.11	-0.05	-0.10
WoodPap	-0.21	-0.08	12.69	1.26	-0.45	-0.24	0.00	-0.28	0.05	-0.10	-0.01	-0.36	-0.17	-0.14	-0.11	-0.18	-0.14
PetMin	-0.17	-0.10	11.30	0.25	-0.33	-0.26	-0.25	-0.37	-0.11	-0.19	0.03	-0.37	-0.46	-0.16	-0.06	-0.18	-0.13
Chemicals	-0.16	-0.07	11.11	0.93	-0.21	-0.20	-0.16	-0.23	-0.13	-0.20	-0.02	-0.05	-0.40	-0.12	-0.16	-0.12	-0.12
BasicMetal	-0.17	-0.11	2.95	1.14	0.07	-0.14	-0.05	-0.20	-0.10	-0.14	0.01	-0.14	-0.42	-0.13	-0.01	-0.16	-0.11
FabrMetals	-0.20	-0.13	8.45	0.48	0.10	-0.21	-0.25	-0.22	-0.15	-0.18	-0.12	-0.27	-0.40	-0.15	-0.19	-0.18	-0.15
OthMnfcs	-0.15	-0.11	6.10	3.09	-0.27	-0.22	-0.07	-0.19	-0.12	-0.04	-0.12	-0.11	-0.24	-0.10	-0.16	-0.16	-0.14
Utilities	-0.19	-0.10	11.30	0.44	-0.39	-0.23	-0.23	-0.32	-0.14	-0.19	-0.11	-0.46	-0.55	-0.17	-0.16	-0.13	-0.13
Constr	-0.23	-0.14	12.77	0.29	-0.37	-0.26	-0.28	-0.34	-0.14	-0.21	-0.11	-0.41	-0.52	-0.18	-0.16	-0.18	-0.16
TraTranCom	-0.21	-0.09	12.50	0.27	-0.39	-0.21	-0.27	-0.32	-0.12	-0.23	-0.07	-0.35	-0.50	-0.15	-0.13	-0.17	-0.13
PrivSvces	-0.21	-0.10	12.81	0.31	-0.44	-0.24	-0.30	-0.33	-0.11	-0.16	-0.08	-0.37	-0.47	-0.17	-0.15	-0.17	-0.14
PubSvces	-0.22	-0.11	13.31	0.36	-0.45	-0.28	-0.28	-0.35	-0.13	-0.27	-0.11	-0.51	-0.60	-0.21	-0.18	-0.19	-0.15

lower than under full free trade. The reduced welfare gain as measured by the EV is the net effect of the exclusion of agricultural goods from the free trade agreement.

Turning to the rest of the macroeconomic results for Japan in Table 3, the deterioration of the terms of trade is now less than before, but the trade results (exports and imports) remain more or less the same. However, the projected trade deficit is substantially reduced as a consequence of the less severe deterioration in the terms of trade. The loss in welfare (as shown by the EV) is also substantially reduced. All in all, the results suggest that the exclusion of agricultural trade from the FTA does not improve the economic outcome for Japan. Indeed, the severity of some of the negative effects may be somewhat reduced.

On examining the projections of demand for labour and capital in Table 4, and the welfare decomposition in Table 5, it is possible to come to a similar conclusion. For Australia, the positive effects observed under full bilateral liberalization are reduced marginally in the event of the exclusion of agriculture from the proposed FTA whereas, for Japan, the magnitude of the negative impact declines.

Sectoral output projections reported in Table 7 indicate how both Australian and Japanese producers respond to the exclusion of agricultural trade from the proposed FTA. The stimulus provided to Australian agriculture is greatly reduced and sectors like "Grains" and "Vegetable and fruits" show decline in outputs. However, sectors such as "Other crops", "Livestock", "Food manufacturing", "Beverages and tobacco", and "Textile and leather" perform better than before. For Japan, the outcome is still not as good as one would expect given the unusually heavy protection afforded the agricultural sectors. The highly protected "Grains" sector in Japan still shows a decline in output and the previous marginal gain experienced by the "Vegetable and fruit" sector has now been reversed. Many other sectors in Japan undergo output changes that are very small in magnitude. In sum, it thus seems that the

exclusion of agricultural goods from the FTA has not changed the option (i) results significantly.

7   Concluding Remarks

The proposed Australia-Japan FTA is likely to generate a heated debate amongst the Pacific community of nations. Economists can play a positive role in this debate by providing carefully modelled estimates of the economic magnitudes involved. Accordingly, we have sought to contribute some preliminary findings on the probable impact of the proposed Australia-Japan FTA using the GTAP multicountry CGE model. Two different plausible alternative scenarios were examined: full free trade and full free trade without agricultural goods.

A number of informative conclusions can be drawn from our estimates. In the first place, under full free trade, Australia will benefit substantially in terms of both GDP and welfare projections. Australian exports to and imports from Japan will increase markedly and its improved terms of trade will yield a larger trade surplus. By contrast, Japanese economic performance under full free trade is not favourable in aggregate. Its trade deficit will increase and GDP will fall. Secondly, the exclusion of agricultural goods from the proposed FTA will improve Japanese economic prospects only marginally, but still result in an overall negative outcome.

These conclusions should not perplex trade negotiators. After all, since the Japanese economy dwarfs its Australian counterpart, it is not surprising that bilateral trade liberalisation should have a comparatively small impact on Japan and a significant effect on Australia. While Australia will experience considerable structural change, Japanese sectoral output responses are almost negligible, except in the politically sensitive case of agriculture.

Policymakers should thus embrace the fact that Australia has much to gain and Japanese non-agricultural producers very little to lose from an Australia-Japan FTA.

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Appendix Table A1:   Regional and Commodity Aggregation

Aggregated Region	GTAP Region	Aggregated Commodity	GTAP Commodity
1. North American Free Trade Area (NAFTA)	U.S.A. Canada Mexico	1. Grains	Paddy rice, wheat, cereal grains nec
2. European Union (EU)	United Kingdom Germany Denmark Sweden Finland Rest of European Union	2. Vegetables and Fruits	Vegetables, Fruits, Nuts, Oil seeds
		3. Other Crops	Sugar cane, Sugar beet, Plant-based fibers, Crops nec
		4. Animals and animal products	Cattle, sheep, goat, horses, Animal products nec, Raw milk, Wool, silk-worm cocoons
3. Australia (AUS)	Australia		
4. New Zealand (NZ)	New Zealand	5. Forestry and Fishing	Forestry, Fishing
5. Japan (JAP)	Japan	6. Minerals	Coal, Oil, Gas, Minerals nec
6. Korea (KOR)	Korea	7. Food manufactures	Meat: cattle, sheep, goats, horse; Meat products nec, Vegetable oil and fats, Dairy products, Processed rice, Sugar, Food products nec
7. Indonesia (IND	Indonesia		
8. Taiwan (TWN)	Taiwan		
9. Malaysia (MLY)	Malaysia	8. Beverages and Tobacco	Beverages and tobacco products
10. Philippines (PHL)	Philippines	9. Textiles and leather	Textiles, Wearing apparel, Leather products
11. Singapore (SGP)	Singapore		
12. Thailand (THA)	Thailand	10. Wood and Paper Products	Wood products, Paper products, publishing
13. Vietnam (VIET)	Vietnam		
14. China (CHN)	China	11.Petroleum and other mineral products	Petroleum, coal products, Mineral products nec
15. Hong Kong (HGK)	Hong Kong	12. Chemical, Rubber, Plastic	Chemical, rubber, plastic prods
16. South Asia (SAS)	India Sri Lanka Bangladesh Rest of South Asia		
		13. Basic metals	Ferrous metals, metals nec
17. Rest of the World	All Other Regions	14. Fabricated Metal Products	Metal products, Motor vehicles and parts, Transport equipment nec, Electronic equipment, Machinery and equipment nec
		15. Other Manufactures	Manufactures nec
		16. Electricity, Gas, Water	Electricity, Gas manufacture and distribution, Water
		17. Construction	Construction
		18. Trade, Transport, Communication	Trade, Sea transport, Air transport, Communication
		19. Private Services	Financial services nec, Insurance, Business services nec, Recreation and other services, Dwellings
		20. Public Services	PubAdmin/Defence/Health/Education

Source; Dimaranan and McDougall et al. (2002)