



*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# **Temporary Migration, Remittances and Agriculture**

David Vanzetti

Australian National University, Canberra

Contributed paper at the 54th AARES Annual Conference,  
Adelaide, South Australia 10-12 February 2010

---

## **Abstract**

Discussions within the World Trade Organization on the temporary movement of labour across borders have met with limited success, in spite of the potential benefits to both home and destination countries. Developed countries have been reluctant to allow increased immigration because of concerns about the social and economic impacts of integrating foreign workers. Recently available bilateral data on current migration flows, differences in wages and remittances makes it possible to estimate the potential impacts of temporary migration on wages and national income. Using a general equilibrium model that separates skilled and unskilled labour, we show that a three per cent increase in the labour force due to increased migration would increase national income in Australia and New Zealand by an estimated US\$5 billion annually. Remittances sent abroad would amount to an additional US\$750 million. Most developing country regions would benefit. More specifically, allowing in 10,000 temporary unskilled workers to work in the agricultural sector in Australia generates estimated welfare gains of US\$100 million.

*JEL subject codes F13, Q17.*

*Key words: Migration, trade, GATS mode 4*

## **Introduction**

It has long been asserted that liberalising the movement of labour across countries would result in substantial benefits. Nonetheless, despite ongoing liberalisation of the goods and financial markets, countries have been reluctant to open up their labour markets. This is partly because of concerns that migrants will undermine the wages and income of local employees, and because of concerns about assimilation or integration of permanent immigrants into society. A common response has been to allow the temporary migration of a limited amount labour. In contrast to many European countries, Australia has to date not taken this approach, although in recent years there has been pressure to allow in seasonal migrant workers to work in the agricultural sector.

Despite longstanding concerns about a brain drain through the loss of productive workers, developing country governments consider temporary or permanent migration as a means of taking advantage of abundant labour. Benefits to the home country from which emigrants come depend largely on remittances. The loss of skilled labour adversely affects productivity in the home country although migrants returning to their home country may have greater skills.

Liberalisation of goods trade generates gains because of the differences in prices in different countries. The removal of barriers to trade brings the divergent prices closer together. It is clear that the differences in the price of labour in different countries are far greater than the differences in prices in nominal terms. Even allowing for purchasing power differences, average wages in China are far less than in the United States. For this reason there are significant potential gains to both countries if labour where to flow from the low wage to the high wage countries, just as goods flow from low cost to high cost countries.

Developing countries have proposed within the WTO's ongoing negotiations on services trade liberalisation that members permit three per cent of their workforce be allowed in as temporary migrants. If implemented, this proposal would benefit both sending and receiving countries, although the gains would not be evenly distributed. The purpose of this paper is to quantify the magnitude of the potential gains and the implications for the agricultural sector.

The Australian Government has recently permitted an increase in temporary migrants to work in the agricultural sector, particularly for season work such as fruit picking. In September 2009 it passed into law a requirement that temporary migrants must be paid the same wages as local employees. The implications for agriculture of this influx is quantified here.

The impacts of migration depend on the bilateral flows of migrants and associated remittances back to the source countries. In the next section bilateral flows of migrants and remittances are described. Migrants are assumed to respond to wage differences, so these are documented. A general equilibrium model, GTAP, is used to analyse the potential trade and welfare impacts. Results and implications follow.

## **Migration, wages and remittances**

Increased quotas for temporary migrants is the subject of the WTO's General Agreement on Trade in Services (GATS), entered into in 1995. GATS defines four

modes of supply of services, of which Mode 4 refers to the ‘temporary movement of natural persons’ (WTO 2006). GATS Article I 2. (d) defines Mode 4 as the supply of a service by “... a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member”. ‘Natural persons’ refers to self-employed individuals who provide a service in another country (GATS Article XXVIII(k)). It is not clear whether it covers foreigner employed by local firms. The term ‘temporary’ is not defined but reflects the notion that the movement is not permanent. It is generally understood to mean between 3 months and three to five years.

An assessment of the effects of migration and possible policy changes requires data on current migration flows, differences in wages and remittances. Such data has recently been assembled by GTAP (Parsons et al. 2007) using remittance data from the World Bank (Ratha 2003) and is available as the GMig2 database, available from the GTAP website.<sup>1</sup> Of the world's three billion workers, the vast proportion is unskilled, and also living in developing countries. The major migratory flows are from Latin America and Mexico to the United States and from Eastern Europe, Northern Africa and Middle East into Western Europe. These two regions have about ten per cent of foreign born workers in their labour force. Australia (20 per cent) and Canada (17 per cent) are the countries with the highest share of foreign workers.

**Table 1 Shares of labour force home and abroad, 2005**

Region	Unskilled labour force million	Skilled labour force million	Foreign born labour force %	Labour force living abroad %
USA	98	51	10.95	0.88
Canada	12	5	16.57	4.79
Mexico	37	6	0.58	9.24
UK	18	12	7.73	7.11
Germany	26	15	10.74	5.33
Rest of EU	75	34	7.55	5.75
Rest of Europe	9	5	9.91	12.26
Eastern Europe	45	12	3.13	6.93
FSU	119	27	9.65	11.07
Australia-NZ	8	4	19.61	5.00
China	743	34	0.23	0.49
Japan	48	21	0.99	0.69
Rest of East Asia	42	8	0.62	2.71
South East Asia	234	37	0.92	1.88
India	441	33	0.65	0.88
Rest of South Asia	148	10	1.91	4.17
Brazil	67	15	0.32	0.55
Rest of Latin America	89	21	2.07	5.92
Middle East and North Africa	116	37	6.08	4.97
Southern Africa	293	20	2.18	2.53
Rest of World	3	1	3.82	7.41
Total	2671	406		

Source: GMig2 database, reported in Walmsley et al. 2007.

<sup>1</sup> [www.gtap.org](http://www.gtap.org)

In terms of workers living abroad, the Rest of Europe (other than the European Union) and the former Soviet Union and Mexico have the greatest share, around ten per cent. India and China have very low shares, although these countries make up a large share of developing country migrant workers.

Remittances received and sent by unskilled and skilled labour in each region are shown in table 2. The USA is by far the largest source of remittances, providing almost half the total. Skilled labour provides the major share. Bilateral data, not shown here, reveals the source of the skilled labour into the US is mainly the European Union, and Rest of Latin America (excluding Brazil), India and South East Asia. The unskilled labour is from Mexico and Rest of Latin America. By contrast, Western Europe (i.e. UK, Germany and Rest of EU) appear to take in a greater share of unskilled labour, mainly from Middle East and North Africa. The UK takes a large share of its workers from India and the rest of South Asia, Commonwealth countries. There is, of course, a lot of internal migration within the European Union, where there are no official border restrictions.

The Australia-New Zealand region receives US\$3458 million in remittances and sends \$6717 million.<sup>2</sup> Of this, some \$980 million is accounted for by transactions between the two countries. For remittances received, skilled labour accounts for nearly 60 per cent. For remittances sent, the split between skilled and unskilled labour is about even.

Wage rates also differ significantly between countries. Nominal wage rates in Japan and the United States are 50 to 100 times higher than those in China and India. After adjustment for purchasing power parity the differentials are reduced considerably, with China around \$16,000 and India \$8,000 compared with \$50,000 in the United States and US\$28,000 in Australia-NZ. Nonetheless, these differentials provide suitably skilled migrants with plenty of incentive.

---

<sup>2</sup> All currencies are in US\$ unless otherwise stated.

**Table 2 Remittances received and sent, 2005**

Region	Received from unskilled labour	Received from skilled labour	Sent by unskilled labour	Sent by skilled labour
	\$m	\$m	\$m	\$m
USA	1185	1846	38888	48394
Canada	1405	2742	2844	5203
Mexico	11828	2767	442	294
UK	2287	2742	6854	4320
Germany	2881	2812	6927	3895
Rest of EU	20412	13966	16378	6209
Rest of Europe	3036	1640	3847	1644
Eastern Europe	3777	2632	858	331
FSU	1776	2030	1249	1089
Australia-NZ	1438	2020	3221	3496
China	1759	2867	1132	2416
Japan	293	785	1478	1155
Rest of East Asia	1200	2813	218	863
South East Asia	5235	10095	1297	1816
India	5293	12113	415	1003
Rest of South Asia	4938	5164	812	1224
Brazil	1296	1525	297	227
Rest of Latin America	13099	10121	2167	1933
Middle East and North Africa	10618	8000	6383	5643
Southern Africa	3380	3899	1656	1551
Rest of World	378	290	150	166
Total	97511	92871	97511	92871

Source: GMig2 database.

The differential between skilled and unskilled labour also varies greatly. It tends to decline with income levels, from three or four fold in poor countries to as little as ten per cent in developed countries. There is hardly any differential in Canada. There are large differentials in China and India, two of the largest source countries for migrants.

**Table 3 Purchasing power parity adjusted average wage rates, 2005**

<b>Region</b>	<b>Purchasing power parity</b>	<b>Unskilled labour</b>	<b>Skilled labour</b>
	\$	\$m	\$m
USA	1.00	37,278	50,430
Canada	1.24	26,450	28,432
Mexico	1.60	5,235	13,611
UK	1.11	29,742	33,533
Germany	1.10	23,891	26,577
Rest of EU	1.27	21,982	33,453
Rest of Europe	0.98	15,605	21,722
Eastern Europe	2.64	8,069	12,730
FSU	4.31	4,923	7,150
Australia-NZ	1.33	21,504	27,901
China	4.13	2,611	16,552
Japan	0.76	22,033	31,042
Rest of East Asia	1.61	8,955	26,517
South East Asia	3.32	2,181	5,141
India	5.49	1,896	7,997
Rest of South Asia	4.26	1,525	6,469
Brazil	2.36	5,553	13,979
Rest of Latin America	1.95	5,831	10,970
Middle East and North Africa	2.33	5,590	7,476
Southern Africa	3.52	1,406	6,894
Rest of World	3.35	5,098	7,324

Source: GMig2 database.

The share of wages sent home varies greatly, depending on skill levels, wage differentials, tax treatment and other indeterminate factors. Estimates indicate that Indians send home 50 per cent of their income earned abroad, although Chinese contribute only ten per cent. Developed country workers tend to remit a lower percentage, less than ten per cent. This may reflect the lower wage differentials. A notable exception is Australia-New Zealand, where 50 per cent is send home. On modelling the impact of an increase in the quota of migrants, the share of wages remitted is assumed to remain constant for each region.

**Table 4 Share of wages remitted, 2005**

Region	Unskilled labour	Skilled labour
	%	%
USA	7	7
Canada	16	16
Mexico	11	11
UK	8	8
Germany	10	10
Rest of EU	30	34
Rest of Europe	17	17
Eastern Europe	13	12
FSU	12	10
Australia-NZ	54	46
China	9	10
Japan	6	6
Rest of East Asia	9	10
South East Asia	16	20
India	47	48
Rest of South Asia	35	39
Brazil	33	33
Rest of Latin America	16	15
Middle East and North Africa	21	32
Southern Africa	18	19
Rest of World	12	12

Source: GMig2 database.

In modelling the impact of an increase in temporary migrant quotas, a key assumption is that migrants receive their home wage plus some proportion of the difference between that wage and the wage in the host country. That is:

$$W_{rc} = W_{rr} + \beta(W_{rc} - W_{rr})$$

Where  $W_{rc}$  and  $W_{rr}$  refer to wages received by the migrant worker in the host and home country respectively, and  $\beta$  is a constant, here fixed at 0.75. This implies migrant workers are prepared to work for their previous wage plus three quarters of the difference. Thus, they are prepared to undercut host country workers. The value of this parameter is difficult to determine and can significantly affect results.

Other important assumptions are: (i) that remittances are a constant proportion of income in each region for each labour type; (ii) migrant workers pay taxes but do not receive welfare benefits or income from land or capital; (iii) total wages are held constant so an increase in migrant workers lowers wages for host country workers; and (iv) a proportion of workers return to their home countries and are more productive than when they left.

Apart from these modifications, the standard GTAP model is used to analyse an exogenous increase or decrease in each regions labour force. The model is a static, multiregional, multisector, computable general equilibrium (CGE) model that assumes perfect competition and constant returns to scale. Bilateral trade is handled via the Armington assumption that differentiates imports by source. Input-output tables reflect the links between sectors. GTAP was designed for the analysis of trade

policies, such as the liberalization of tariffs, which are likely to have international and intersectoral effects, but the equally well be used to analyse the impact of a change in endowments (labour in this case). The input-output tables capture the indirect intersectoral effects, while the bilateral trade flows capture the linkages between countries. A shock or policy change in any sector has effects throughout the whole economy. An increase in labour lowers wages and prices and increases output. Lower wages are detrimental to permanent residents, but this may be offset by reduced prices for consumers. CGE models attempt to capture these effects. The methodology involves specifying a data set that represents a specific year, postulating a change in the labour force, and comparing the simulated outcome with the base data. The supply of immigrants is determined by the pattern of bilateral migrant flows in the base period. Impacts of on wage rates, incomes, trade flows, government revenues and welfare within countries can then be ascertained. It is important to note that there is no dynamic elements assumed here, although in reality the policy changes are implemented over time and there are, in addition, time lags for their effects to work through. Dynamic gains are ignored, but so are adjustment costs.

### The scenarios

The scenarios are described in table 5. The first scenario assesses the impact of a hypothetical GATS Mode 4 outcome. The second shows the potential impact if Australia-NZ were to increase the unskilled labour force by allowing in temporary migrants. Furthermore, it is assumed these migrants would only work in the agricultural sector. This limitation reflects the demand for seasonal agricultural workers for jobs such as fruit picking.<sup>3</sup> These policy change impact labour exporting countries only through the labour market, remittances and trade.

**Table 5 Scenarios**

Scenario	Label	Description
1	Mode 4	Three per cent increase in unskilled and skilled labour force in USA, Canada, Japan, UK, Germany, Rest of EU, Rest of Europe and Australia-NZ. Corresponding decrease in labour supplying countries according to baseline bilateral flows.
2	ANZ	Increase of 10,000 in unskilled labour force in Australia-NZ. The additional workers are restricted to the agricultural sector.

Specific questions to be addressed include:

- (i) Do real wages fall in the labour-importing country?
- (ii) Does welfare rise in the labour-importing country?
- (iii) What happens to returns to non-labour factors?
- (iv) Are labour-exporting (developing) countries better off?
- (v) Which sectors benefits from the influx of labour?

For purposes of these scenarios the world is divided up into 21 regions and 22 traded commodities. The developed countries are the USA, Canada, UK, Germany, Rest of the EU, Rest of Europe (excluding Eastern Europe and FSU), Australia-NZ and

---

<sup>3</sup> To assess the importance of restricting the imported labour to the agricultural sector, we run a further simulation that allows workers to work in any sector.

Japan.<sup>4</sup> These are labour importing countries. The remaining regions, as shown in table 6, are treated as labour exporting countries.

### Results for Mode 4

Changes in each region's labour force in response to the policy reforms are shown in tables. For Australia-NZ, the 3 per cent increase in the labour force amounts to 360,000. In most labour-exporting countries there is a decrease in their own labour force of most instances, although Mexico and Rest of Latin America are notable exceptions. Of particular interest is the estimated effect on wages of the influx of labour. This is shown in the third and fourth columns. In Australia-NZ for example, the effect is negative, with real wages falling 1.05 per cent for unskilled labour and 1.29 per cent for skilled labour. There are similar falls, around one per cent, in most labour importing countries. In labour-exporting countries real wages generally rise in proportion to the labour exodus, although there are a couple of exceptions where real wages fall. In India and China a nominal wage rise is more than offset by inflation.

**Table 6 Potential labour force impacts relative to base following increase in migrant quota in developed countries**

Regions	Labour force size		Real wages	
	Unskilled %	Skilled %	Unskilled %	Skilled %
USA	3*	3*	-0.9	-0.95
Canada	3*	3*	-0.97	-1.12
Mexico	-3.46	-2.96	2.19	2.33
UK	3*	3*	-0.8	-0.93
Germany	3*	3*	-1.03	-1.05
Rest of EU	3*	3*	-1.05	-1.16
Rest of Europe	3*	3*	-1.27	-0.83
Eastern Europe	-1.71	-3.51	0.72	2.6
FSU	-0.22	-0.92	-0.2	0.51
Australia-NZ	3*	3*	-1.05	-1.29
China	-0.09	-1.16	-0.1	0.76
Japan	3*	3*	-0.93	-0.95
Rest of East Asia	-1.79	-5.75	0.36	3.81
South East Asia	-0.33	-1.49	0.13	1.2
India	-0.05	-0.69	-0.05	0.8
Rest of South Asia	-0.19	-1.48	0.13	1.62
Brazil	-0.39	-0.89	0.3	1.03
Rest of Latin America	-1.52	-3.34	0.76	2.73
Middle East and North Africa	-1.29	-1.38	0.78	1.07
Southern Africa	-0.19	-2.07	0.1	1.89
Rest of World	-2.23	-2.25	1.83	2.15

Source GTAP simulations. \* Exogenous change.

<sup>4</sup> Australia and New Zealand are treated as one region because this is how the GTAP data are assembled. Although inconvenient, the region is characterised by a free flow of labour, as citizens of each country can work in the other.

Falling wages in developed countries and rising wages in labour exporting countries have narrowed the gap somewhat. However the difference is marginal, with significant scope for further gains. The annual wage in Australia-NZ for unskilled labour was US\$21,504 in the base compared with US\$1,896 in India. After an influx of migrants the difference has narrowed by little more than \$200.

Annual welfare gains and the contribution of remittances are shown in table 7. Global gains amount to \$287 billion. These gains results from using a given global workforce more productively. There is no net gain in employment, with an increase in the labour force of one country being offset by a fall in another. However, almost all the welfare gains accrue to the labour importing countries. Only \$9 billion are captured by developing countries. Furthermore, several developing country regions, particularly Rest of East Asia, are estimated to experience a net welfare loss. This is the region with the largest outflow of skilled labour (table 6). It also has a low share (9-10 per cent) of wages remitted.

Labour-importing countries lose the remittances that are transferred abroad but the welfare gains vastly exceed these amounts. In Australia-NZ the remittances sent abroad amount to \$742 million but the welfare gains are near \$5 billion. Of the change in welfare, \$2.8 billion can be attributed to the increase in unskilled labour with the remainder due to the influx of skilled labour.

**Table 7 Potential welfare impacts relative to base following increase in migrant quota in developed countries**

	Remittances \$m	Welfare \$m
USA	-17,847	119,252
Canada	-1,120	9,216
Mexico	5,326	-774
UK	-4,128	15,915
Germany	-2,125	21,469
Rest of EU	-7,069	47,945
Rest of Europe	-977	6,865
Eastern Europe	2,660	-1,638
FSU	715	214
Australia-NZ	-742	4,909
China	1,564	-333
Japan	-7,393	52,812
Rest of East Asia	2,874	-9,231
South East Asia	5,434	5,033
India	4,767	4,768
Rest of South Asia	3,063	3,133
Brazil	3,300	2,169
Rest of Latin America	7,764	612
Middle East and North Africa	6,137	2,337
Southern Africa	2,769	2,423
Rest of World	222	202
Total	5,193	287,299

Source GTAP simulations.

Although wages in labour-importing countries are reduced by the increased supply of labour, returns to owners of capital and land increase. Quantities of land and capital are assumed fixed in each region, so the increased availability of labour raises the productivity of these factors. In addition, the larger population increases the demand for land intensive (i.e. food) and capital intensive goods. Land prices rise around 7 per cent in labour-importing countries, but tend to fall in labour-importing countries, as shown in table 8. The impacts on capital prices are much more modest because of the larger base.

**Table 8 Potential real land and capital prices relative to base following increase in migrant quota in developed countries**

	<b>Land</b>	<b>Capital</b>
	%	%
USA	7.07	1.14
Canada	7.00	1.04
Mexico	-2.24	-0.66
UK	9.13	1.05
Germany	7.48	0.91
Rest of EU	9.31	0.79
Rest of Europe	5.12	1.26
Eastern Europe	-2.05	-0.64
FSU	-0.03	-0.29
Australia-NZ	7.05	1.03
China	0.43	-0.20
Japan	8.20	1.04
Rest of East Asia	-2.98	-1.29
South East Asia	1.07	-0.18
India	1.23	-0.23
Rest of South Asia	0.88	-0.14
Brazil	0.80	-0.39
Rest of Latin America	-1.92	-0.65
Middle East and North Africa	-0.96	-0.31
Southern Africa	1.25	-0.20
Rest of World	-2.84	0.34

Source GTAP simulations.

### **Sectoral effects in agriculture**

The effects of the additional immigration on the agricultural sectors in Australia-NZ are shown in table 8. The increased population increases demand for food products, but additional labour lowers the costs of production by lowering wages, as noted in table 6. The net effect on market prices can be either positive or negative. For Australia-NZ the effect is to increase the market price of crops and livestock while reducing the price of processed products, although the magnitudes are small, less than one per cent. The increase in output is around 2 per cent, which corresponds to the increase in the population.

The increase in output can be decomposed into the contribution of skilled and unskilled labour. The agricultural sector gains most from the increase in unskilled labour, reflecting the intensity of use of this sector.

**Table 8 Sectoral impacts in Australia-NZ**

Market price	Domestic output			%
	Total	Attributable to unskilled labour	Attributable to skilled labour	
		%	%	
Crops	0.60	1.79	1.29	0.50
Livestock	0.40	1.63	1.14	0.48
Meat	-0.09	2.2	1.48	0.72
Dairy	-0.04	2.1	1.46	0.64
Food	-0.10	2.06	1.33	0.73
Other primary	0.73	0.53	0.35	0.19

Source GTAP simulations.

### Results for Australia-NZ agricultural labour increase

The second scenario examines a hypothetical intake of 10,000 unskilled workers into the Australian-NZ agricultural sector. The Australian Farm Institute claims there demand for 25000 – 80,000 seasonal workers.<sup>5</sup> The agricultural sector in Australia involves much seasonal work and has pressed for increased allowance of migrant labour to work in areas such as fruit picking and abattoirs. Australia's 457 visa allows migrants to work for periods no longer than four years. The number is not capped, but is restricted to employers who wish to employ to fill 'nominated skilled positions in Australia' (Dept of Immigration and Citizenship).<sup>6</sup> Concern has been raised about abuse of workers, particularly payment at less than market rates. Labour unions have also expressed concerns about migrant workers undercutting their pay and conditions. There are no special provisions for regional areas, but the agricultural sector employs 650,000 workers that are classified in the database as unskilled, some 8 per cent of the unskilled workforce.

Australia's 457 visas for temporary employment are targeted to specific skills. An interesting issue is whether these workers crowd out existing workers into others sectors. The estimated impacts on factor prices and welfare are shown in table 9. The two columns compare the results under differing assumptions as to the substitutability of labour. The first column, 'All sectors' is based on the assumption that temporary workers can go into any sector. The second assumes the additional workers increase the agricultural workforce with no substitution into the wider economy. The estimated annual welfare gains are somewhat greater in the first case. Unskilled wages fall only slightly, while returns to other factors, skilled labour, land and capital, rise slightly. In the second case, wages of the unskilled in the agricultural sector fall by one per cent, and there is a similar increase in land prices, 0.7 per cent.

<sup>5</sup> Cited in Millbank (2006).

<sup>6</sup> In 2008 there were 68,000 457 visa holders in Australia, according to the Dept of Immigration and Citizenship (<http://www.immi.gov.au/skilled/skilled-workers/sbs/>)

**Table 9 Impact of 10,000 temporary migrants to Australia-NZ**

	All sectors	Agriculture only
	\$m	\$m
Welfare	116.45	100.48
	%	%
Wages, unskilled	-0.06	-0.11
Wages, skilled	0.02	0.07
Wages, unskilled in agricultural sector	-0.06	-1.23
Land price	0.12	0.76
Capital price	0.03	0.03

Source GTAP simulations.

The sectoral impacts of an additional source of labour follow. There would be an increase in the demand for labour because of the fall in the wage rate. This is nearly one per cent for meat and dairy products (table 10). It is assumed here that food and other primary products are not part of the agricultural sector that attracts temporary migrant labour. There would be small increases in output and exports.

These results can be scaled up. A simulation with a 100,000 increase in temporary migration generates impacts around ten times those reported here, assuming there would be demand for this number of additional workers.

**Table 10 Sectoral impacts in agriculture**

	All sectors	Agriculture only
	%	%
<b>Employment of unskilled labour</b>		
Crops	0.05	0.59
Livestock	0.05	0.45
Meat	0.08	1.05
Dairy	0.08	0.97
Food	0.10	0.08
Other primary	0.02	-0.01
<b>Output</b>		
Crops	0.03	0.35
Livestock	0.04	0.23
Meat	0.05	0.04
Dairy	0.04	0.17
Food	0.05	0.05
Other primary	0.03	0.35
<b>Exports</b>		
Crops	0.00	0.54
Livestock	0.00	0.43
Meat	0.04	0.01
Dairy	0.03	0.20
Food	0.02	0.02
Other primary	-0.03	-0.04

Source GTAP simulations.

## **Implications**

Assuming the data and behavioural parameters are correct, the results suggest that developing countries could be assisted if more migrant workers were allowed into developed countries. With some exceptions, the benefits of remittances and the increased productivity of workers when they return home more than offset the negative effect of the brain drain. This result would be enhanced if there was unemployed labour in developing countries that could be usefully employed following the departure of emigrants. This is likely to be the case at least with unskilled labour.

Developed countries also gain, although some workers in developed countries may lose. The gains from freeing up international labour markets appear to be far greater than those available from liberalising the goods market. This is because the variation in wages across countries is greater than the variation in goods prices.

From the perspective of Australia-NZ, the major share of the gains comes from the immigration of unskilled rather than skilled workers, although the definitions of skilled and unskilled may vary across countries. In terms of source, Australia-NZ would be better off taking migrants from developed countries such as the United States, the UK and Japan, because the share of wages remitted is relatively low. However, if the aim is to assist developing countries, than sourcing immigrants from India, Rest of South Asia and Brazil would be more beneficial. Certainly, the US\$6.7 billion sent in remittances exceeds the foreign aid budget of A\$3.8 billion for Australia and NZ\$480 million for New Zealand (AusAid 2009).

## **Qualifications**

A key assumption in the modelling is that in response to an increase in the quota, migrants arrive from similar sources as they have done historically, ignoring the fact that these flows change from time to time. For Australia-NZ this implies most of the remittances flow back to the UK, Rest of the European Union and South East Asia. In reality a higher proportion of remittances may accrue to Pacific Islanders. This is likely to be the case if the temporary work visas are targeted to particular countries.

A further question is whether migrant workers are substitutable for domestic workers, as assumed here. Sometimes workers are restricted to particular locations, sectors or perhaps employers. Labour, even the unskilled type, is by nature heterogeneous, with abattoir workers untrained at picking fruit. At the margin there is a certain amount of overlap, but the assumption of complete substitutability may lead to an overestimation of losses to domestic workers and the welfare gains. On the other hand, the assumption of no substitutability also seems unrealistic. The benefits to the host country are reduced if workers are restricted to a particular sector, such as agriculture or services. The results also vary according to assumptions about the productivity of labour, substitutability between capital, skilled and unskilled labour, the constant rate of remittance, and whether migrants pay taxes, as assumed here, and receive welfare benefits, not assumed here.

Remittance data may not be unreliable. Not all transfers occur through recognised channels, such as Western Union. It is likely that remittances are underestimated.

Further useful refinements to the model would include breaking down the two types of labour into additional categories. Given the importance of remittance data to the outcome for developing countries, improvements in the quality of this data would provide some assurance. The assumption that migrants are sourced according to historical flows could be modified to reflect current patterns. Improved data on the wages received by migrants, assumed here to be three quarters of local wages, would improve the analysis.

## References

- AusAid (2009) ‘About Australia’s aid program’,  
(<http://www.ausaid.gov.au/makediff/default.cfm>).
- Jansen, M. and Piermartini, R. (2004) ‘The Impact of Mode 4 on Trade in Goods and Services’, WTO Staff Working Paper ERSD-2004-07, Geneva.
- Magdeleine, J. and Maurer, A. (2008), 'Measuring GATS Mode 4 Trade Flows', Staff Working Paper ERSD-2008-05, Geneva.
- Millbank, A. (2006) “A Seasonal Guest-Worker Program For Australia?” Research Brief No. 16 2005-06, Parliament of Australia, Parliamentary Library; Social Policy Section, 5 May 2006.
- Parsons, C. R., R. Skeldon, L. A. Winters and T. L. Walmsley (2007). “Quantifying International Migration: A Database of Bilateral Migrant Stocks”, In Schiff M., and C. Ozden (eds), International Migration, Economic Development and Policy, Palgrave and World Bank, chapter 1, 17-58.
- Ratha, D. (2003), “Workers’ remittances: an important and stable source of external development finance”, *In Global Development Finance*, Chapter 7. World Bank.
- WTO (2006) “Background note on GATS mode 4 measurement”, United Nations, New York. (<http://unstats.un.org/unsd/tradeserv/TFSITS/TSGMode4/tsg3-feb06/tsg0602-16.pdf>.)
- Walmsley, T. L., S. Amer Ahmed and C. R. Parsons, (2005) “The GMig2 Data Base: A Data Base of Bilateral Labor Migration, Wages and Remittances”, GTAP Research Memorandum, 6, Center for Global Trade Analysis, Purdue University, IN, USA.
- Walmsley, T. L., L. Alan Winters, and S. Amer Ahmed (2007) 'Measuring the Impact of the Movement of Labor Using a Model of Bilateral Migration Flows', GTAP Technical Paper No. 28, November.

## Appendix

**Table A1 Regions and sectors**

Regions	Sectors
USA	Crops
Canada	Livestock and wool
Mexico	Animals and animal products
UK	Dairy products
Germany	Food and processed agriculture
Rest of EU	Other primary production
Rest of Europe	Lumber and paper
Eastern Europe	Textiles and wearing apparel
Former Soviet Union	Petrochemicals and minerals
Australia-New Zealand	Metals
China	Motor vehicles
Japan	Electronics
Rest of East Asia	Other manufactures
South East Asia	Household Utilities
India	Construction
Rest of South Asia	Trade
Brazil	Transport
Rest of Latin America	Communications
Middle East and North Africa	Financial services
Southern Africa	Insurance
Rest of World	Business Services Government services and recreation