Reserve Bank of New Zealand
Analytical Notes

Why the drivers of migration matter for the labour market

AN2016/02

Jed Armstrong and Chris McDonald

April 2016

Reserve Bank of New Zealand Analytical Note Series
ISSN 2230-5505

Reserve Bank of New Zealand
Po Box 2498
Wellington
NEW ZEALAND

www.rbnz.govt.nz

RESERVE BANK
OF NEW ZEALAND
TE PŪTEA MATUA

NON-TECHNICAL SUMMARY

Net immigration increases both labour demand and labour supply in the economy. Economists are typically most interested in the balance of supply and demand impacts, which we refer to as 'net demand'. Relationships estimated over historical data have suggest that the demand impact is larger than the supply impact. For this reason, positive immigration has been thought to increase net demand and thus lower the unemployment rate.

Net permanent and long-term immigration increased sharply over 2013 and 2014, and reached a record high rate in 2015. In this migration cycle, the boost to net demand appears to be smaller than we would have expected given past relationships. In this paper, we explore why the unemployment rate has been higher than expected given high level of net immigration.

To do this, we decompose the net immigration according to the underlying drivers: Australian unemployment, New Zealand labour market conditions, and other 'exogenous' migration movements. Using this framework, we find that net immigration is sensitive to the relative states of the New Zealand and Australian labour markets. A weak Australian labour market causes high levels of net migration into New Zealand, as does a strong New Zealand labour market.

Our findings suggest that the current migration cycle is predominantly being driven by a higher Australian unemployment rate. This contrasts with the migration cycle of the mid-2000s, which appears to have been unrelated to labour market conditions here and abroad.

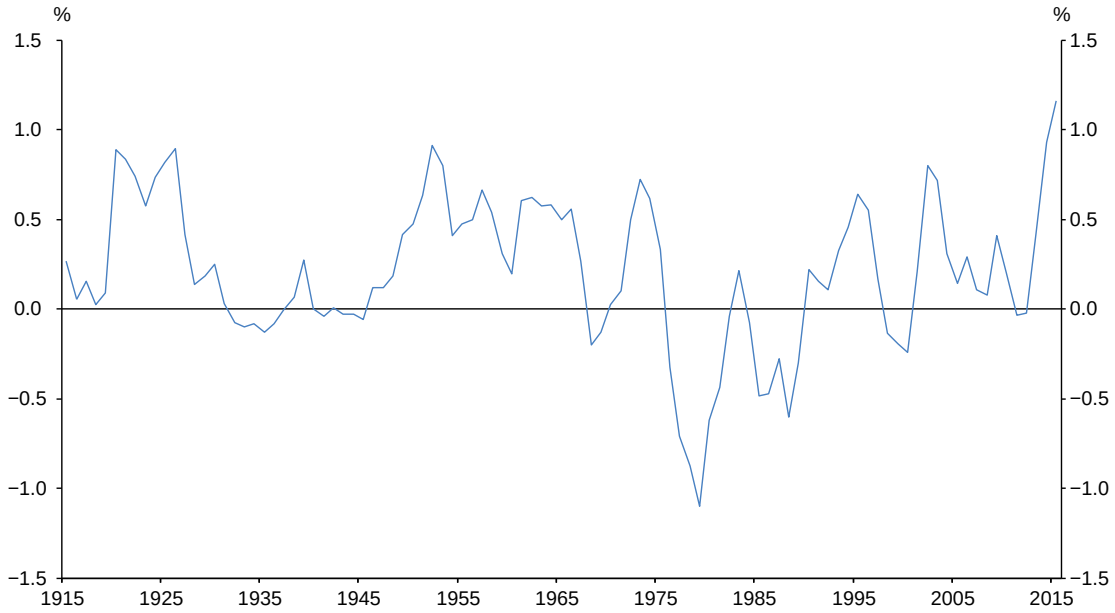
We also estimate the effects of these drivers on the labour market. The direction of the effects on the New Zealand unemployment rate and wage inflation depend on the driver. Higher net immigration due to a higher Australian unemployment rate corresponds to a higher unemployment rate in New Zealand, whereas higher net immigration for other reasons reduces unemployment in New Zealand.

Under this framework, the current coincidence of a high rate of net immigration and a higher-than-expected unemployment rate can be well explained. The recent elevated level of unemployment in Australia has been reflected in the New Zealand unemployment rate, as well as causing high net immigration.

1 INTRODUCTION[1]

New Zealand is currently experiencing its largest annual inflow of net permanent and long-term (PLT) migrants in the last 100 years (figure 1). The current annual inflow is greater than 1 percent of the population.

Figure 1: Annual net immigration (share of New Zealand population)[2]



Net immigration increases both labour supply and labour demand in the economy. Previous research has shown that migrant inflows positively impact house prices and construction activity in New Zealand (Coleman and Landon-Lane, 2007; McDonald, 2013), and so boosts aggregate demand and labour demand. At the same time, net immigration increases the size of the labour force, and so raises the labour supply of the economy. McDonald (2013) shows that net immigration increases the output gap, and so net immigration has been thought to boost demand more than supply. This view appears to have been appropriate during the 2000s migration cycle: increasing housing market pressure, falling unemployment, and consistently-high inflation were all explainable by high net immigration in this framework.

However, in the current migration cycle the net demand boost has been smaller than expected.

[1]We thank Amy Rice, Christie Smith, Dean Ford, and Yuong Ha for their helpful comments on this paper.
[2]March years. Chart shows PLT immigration back to 1921, and total immigration prior to that.

Despite record-high net immigration, the unemployment rate increased between 2014 and the middle of 2015, and inflation was persistently below the bottom of the target band over this period.

Recent empirical work has tried to form a more nuanced story of the impact of immigration on the economy. For example, McDonald (2013) looked at the different impact of migrant arrivals versus migrant departures, of returning New Zealanders versus foreign migrants, and of European migrants versus Asian migrants on housing market pressure. McDonald (2013) showed that arrivals and foreign migrants have larger house-price (and demand) impacts than departures and returning New Zealanders. Similarly, Vehbi (2016) shows that migrants aged 17-29 have a smaller net demand impact than migrants aged 30-49.

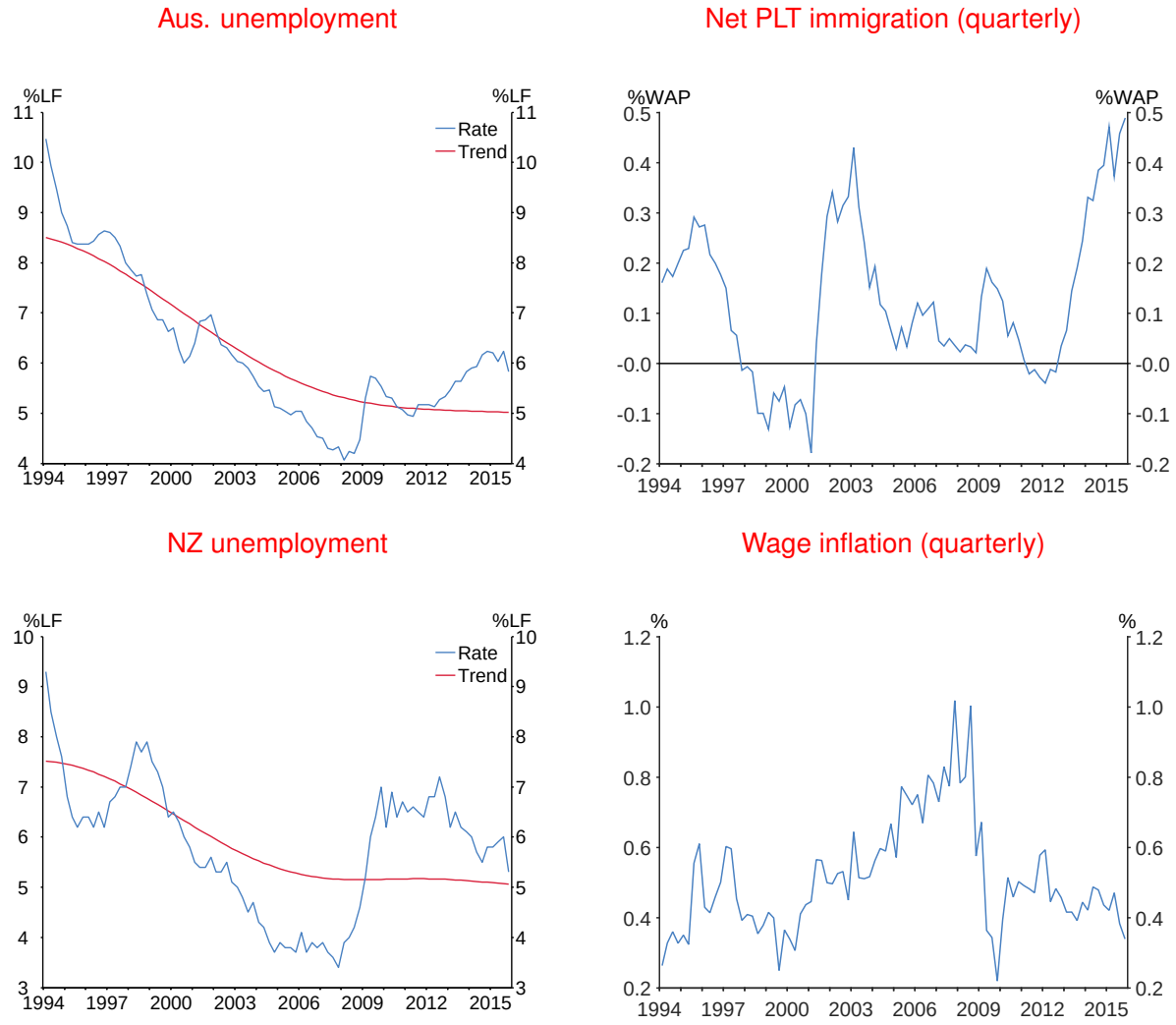
A common (and convenient) approach to modelling the effects of migration has been to treat net immigration as an 'exogenous' development. We present an analysis of how the impact of migration can differ if we do not assume that migration is exogenous. We use a small model of Australian and New Zealand labour markets to show that migration can be a natural response to labour market differentials here and abroad. This type of framework is similar to that used in Gorbey et al. (1999), who showed that it is possible to predict trans-Tasman migrant flows using relative labour market conditions. We identify the effects of an unexplained increase in net immigration and a net immigration boost caused by weakness abroad (specifically, a higher Australian unemployment rate). These effects can help us to understand why currently migration is high while inflationary pressure remains low.

2 THE MODEL

We investigate the impacts of migration using a structural vector autoregression (SVAR) model containing four variables (figure 2): the Australian unemployment rate (de-trended), net PLT immigration to New Zealand, the New Zealand unemployment rate (de-trended), and wage inflation (measured by the quarterly change in the labour cost index). The model is estimated on quarterly data over the sample 1994Q1 to 2015Q4, with four lags.[3]

[3] See Appendix A for the estimation results.

Figure 2: Variables used in estimation



The SVAR framework is commonly used in macroeconomic studies to identify underlying drivers of fluctuations in data, and to determine how different drivers impact key variables of interest. We can use our model to establish the drivers of net immigration over history, and to estimate the impact of these drivers on the economy.

2.1 Identification of shocks

In the model, we assume that the Australian labour market is not impacted by New Zealand's immigration or by the New Zealand labour market. This assumption is based on the fact that

New Zealand's population is one-sixth of the size of the Australian population, and so New Zealand does not tend to be a driver of economic conditions in Australia. We also assume that immigration is affected by the New Zealand labour market after a few months (i.e. not immediately). This assumption is based on the idea that it takes time to move to or from New Zealand, as would-be migrants usually do not immediately respond to changes in labour market conditions.

From these restrictions, we can identify three sets of shocks that explain the data in the model.[4] These shocks are:

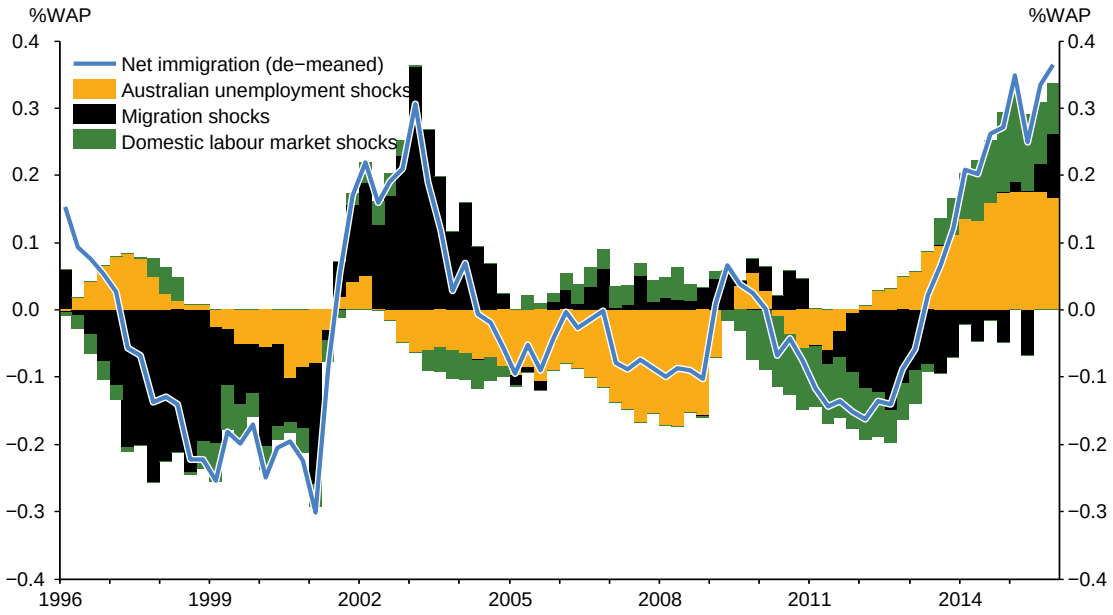
- An Australian unemployment shock, which is any change in the Australian unemployment rate.
- A migration shock, which is any change in net immigration not explained by changes in the Australian unemployment rate or lagged changes in New Zealand labour market conditions. One could interpret this shock as, for example, a change in immigration policy, international security concerns, or a change in preferences for students to study in New Zealand.
- A domestic labour market shock, which is any change in the New Zealand unemployment rate or wage inflation not explained by either changes in the Australian unemployment rate or by changes in net immigration. One could interpret this as, for example, an increase in demand due to stronger terms of trade or, recently, due to the Canterbury rebuild.

[4] Formally, we use a recursive (Cholesky) identification scheme. The Australian unemployment rate is block-exogenised, by restricting appropriate parameters to zero. The Cholesky ordering of the variables is as follows: Australian unemployment, migration, New Zealand unemployment, New Zealand wage inflation. The results were robust to the ordering used in this identification scheme. In particular, the magnitudes and directions of the responses shown below were similar if we ordered migration first (maintaining exogeneity of the Australian unemployment rate) or last. With four series we could, in principle, identify four orthogonal shocks. However, doing so would require an additional restriction. The third shock is essentially a combination of two domestic New Zealand shocks.

3 Drivers of migration

Given this framework, we can decompose the drivers of net immigration over recent history.[5] Figure 3 shows the contributions to net immigration from Australian unemployment shocks (i.e. strength or weakness in the Australian labour market) in yellow bars, migration shocks (i.e. net immigration that is stronger or weaker than would be expected given the Australian unemployment rate and New Zealand labour market conditions) in black bars, and domestic labour market shocks (i.e. strength or weakness in the New Zealand labour market that is unrelated to the Australian unemployment rate and to net immigration) in green bars.

Figure 3: Drivers of net immigration



A striking feature of this decomposition is the difference between how the mid-2000s migration cycle is explained and how the current migration cycle is explained. In this decomposition the mid-2000s cycle was largely driven by migration shocks (black bars). That is, high net immigration was occurring for reasons outside of this model, or for 'exogenous' reasons. That is, relative labour market conditions at the time did not warrant such a large net migration inflow. The impact of these exogenous migration shocks coincides with large increases in foreign student arrivals (Statistics New Zealand, 2010).

[5] We also decompose the drivers of net trans-Tasman immigration and net immigration from the rest of the world. The drivers of trans-Tasman migration can be different to the drivers of other migration. See Appendix B.

By contrast, the current net immigration cycle is largely driven by labour market conditions. The large contribution from the yellow and green bars over 2014 and 2015 shows that net immigration has been driven by Australian unemployment shocks and domestic labour market shocks. The Australian unemployment rate is currently above trend, and the New Zealand labour market is stronger than would be expected given the other variables in the model. This makes New Zealand a more attractive destination for migrants, and discourages departures of New Zealanders, both of which raise net immigration.

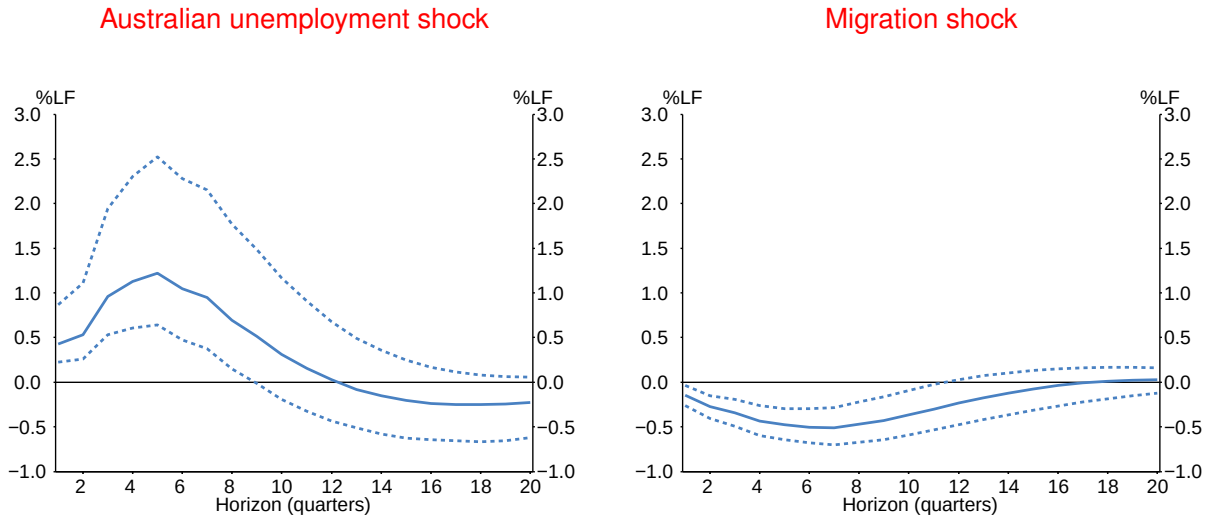
4 DO THE DIFFERENT DRIVERS OF MIGRATION MATTER?

The different drivers of net immigration matter only if they have different effects on the New Zealand economy. We show the estimated effects from our model using impulse response functions (IRFs), which show how each shock impacts the variables in the model. In particular, we can use IRFs to see how unemployment and wages respond to an increase in net immigration driven by an Australian unemployment shock and, separately, an increase in net immigration for exogenous reasons (i.e. driven by the migration shock).

Figure 4 shows the IRFs for the New Zealand unemployment rate.[6] Both shocks are scaled so that the resulting migration boost is equal to 1 percent of the working age population over 2 years. In the case of the Australian shock, an increase in the Australian unemployment usually coincides with higher net immigration to New Zealand. Thus, the IRF corresponding to the Australian unemployment shock shows what happens to the New Zealand unemployment rate if the Australian unemployment rate increases enough to boost net immigration to New Zealand by 1 percent of the working age population. In order to achieve this, the Australian unemployment rate needs to increase by about 1.5 percentage points.

[6] The dashed lines show one standard deviation confidence intervals, based on bootstrapping with 5,000 replications.

Figure 4: Model impulse responses for the New Zealand unemployment rate



Despite both shocks increasing net immigration by the same amount (1 percent of the working age population), their effects on the New Zealand unemployment rate are quite different.[7] The migration shock causes unemployment to fall by up to 0.7 percentage points, an increase in inflationary pressure. This is consistent with previous research, such as in McDonald (2013), where migration is shown to increase the output gap.

The Australian unemployment shock, on the other hand, *raises* the unemployment rate by around 1 percentage point. A higher Australian unemployment rate that generates positive net immigration typically coincides with a higher New Zealand unemployment rate. This implies that when net immigration increases because the Australian unemployment rate is higher, inflationary pressure (proxied by the unemployment rate) may actually decline – similar to what we have seen in recent data.[8]

To complement these unemployment responses, we also include wage inflation in our model. As with the unemployment rate, the responses of wages are divergent (figure 5).[9] The Australian unemployment shock reduces nominal wages by around 1.5 percent over 3 years, while

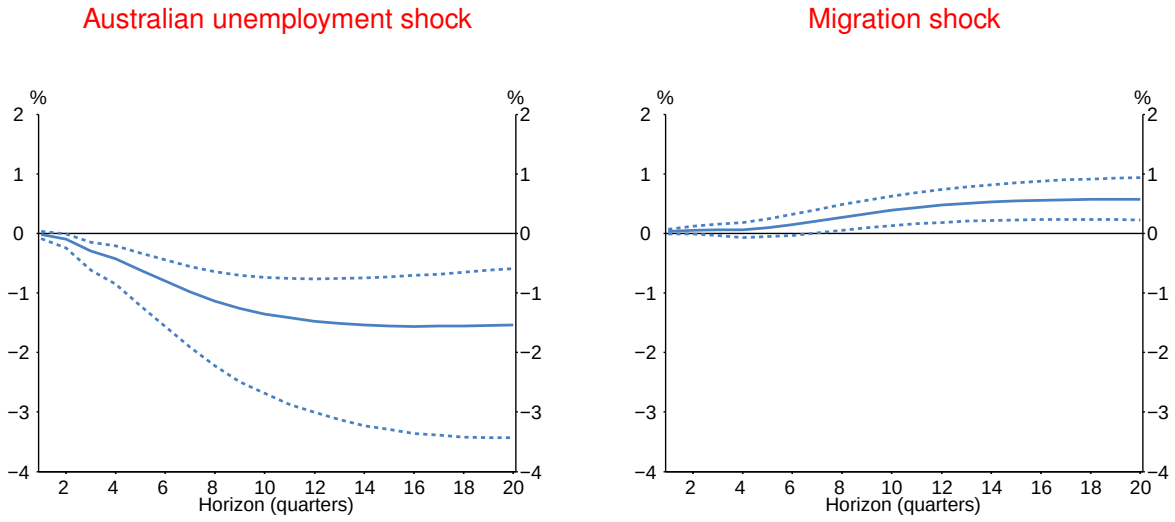
[7] As a robustness check, we estimate the model using total rather than PLT immigration. In order to estimate the model, we had to shorten the data sample to 1996-2015. The results do not change substantially (see Appendix C).

[8] Appendix D shows how these shocks have driven the unemployment rate and wage inflation over history.

[9] Again, we scale the shocks to increase the working age population by 1 percent through higher net immigration.

an unexplained increase in migration increases wages by around half a percent.[10] Again, in the case of the Australian shocks the higher Australian unemployment rate required to generate an increase in net immigration typically coincides with lower wages in New Zealand.

Figure 5: Model impulse responses for wages (level)



5 WHY ARE THESE RESPONSES DIFFERENT?

The impulse response functions in figure 4 show how an increase in net immigration driven by an Australian unemployment shock raises the unemployment rate, while stronger net immigration for exogenous reasons lowers the unemployment rate. The difference in the responses could reflect differences in the labour supply response between the two shocks, differences in the labour demand response between the two shocks, or both.

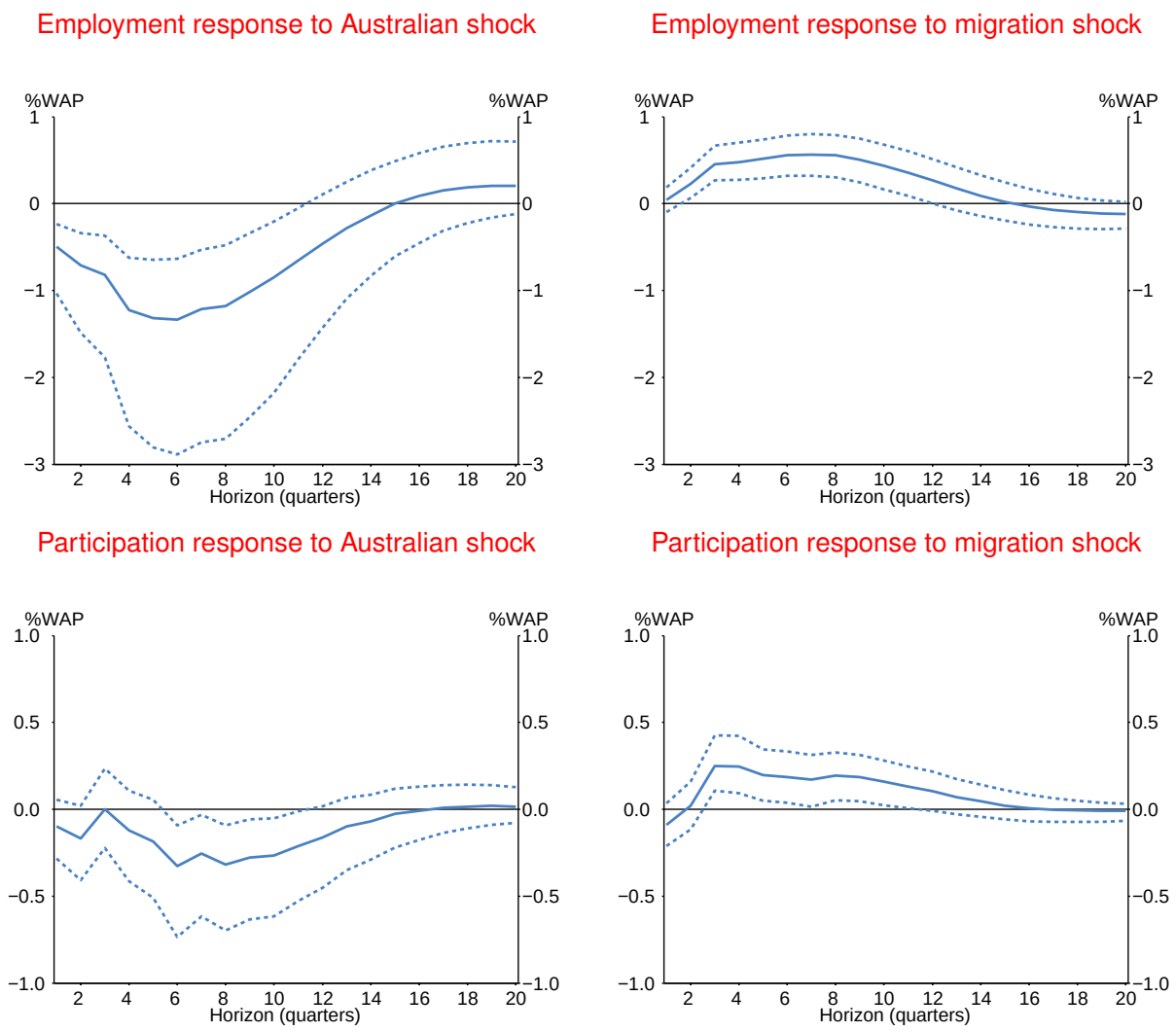
In order to help differentiate between the labour demand and labour supply responses, we replace the unemployment rate in the model with the employment rate and labour force participation rate. This replacement allows us to comment on whether changes in unemployment are driven more by changes in participation or changes in employment.[11] This can shed light on

[10] Given that prices and wages tend to co-move, it is possible that these responses overstate the real wage impacts.

[11] We de-trend the participation and employment rates because we are interested in the short-to-medium term impacts of migration on inflationary pressures. Our model assumes that, after enough time, the participation and

whether labour demand (proxied by the employment rate) or labour supply (proxied by the participation rate) is the cause of the different unemployment response. The separate employment and participation rate responses are shown in figure 6.[12]

Figure 6: Employment and participation rate responses



Both the employment and participation rates fall in response to an Australian unemployment shock. The employment rate falls by 1.2 percentage point, while the participation rate falls by around 0.3 percentage points. Because employment falls by more than participation, the unemployment rate rises.

employment rates will return to their original levels. This implies that an increase in net immigration of 1 percent of the working age population will increase employment and the labour force by 1 percent in the long run.

[12] For each shock, the unemployment response in figure 4 is approximately equal to the difference between the responses in the employment rate and labour force participation rate.

Conversely, an unexplained increase in net immigration (i.e. the migration shock) causes the employment rate to increase by about 0.5 percent, and the labour force participation rate to increase by about 0.2 percentage points. Again, the employment response is larger, and so the unemployment rate decreases given this shock.

A key feature of these results is that the employment responses are larger than the participation responses. The participation rate responds by around a quarter of the change in employment, but usually in the same direction. This size difference suggests that it is differences in employment (rather than differences in participation) that cause the divergent effects on unemployment and, as a result, on wage inflation. Moreover, there is a strong correlation between employment and participation in New Zealand, reflecting a form of encouraged worker effect and a high rate of direct transition from not-in-the-labour-force to employment (Silverstone and Bell, 2011). Thus, it is possible that the participation rate responses are due to the changes in employment rates.

There are a number of possibilities why the two shocks could impact employment differently. The types of migrants could be different and this might cause them to have different effects on aggregate demand and employment. This was explored in McDonald (2013) and Vehbi (2016). Their results complement ours – an exogenous increase in net immigration is found to increase the output gap or decrease the unemployment rate.

Alternatively, the Australian unemployment shock could capture other indirect demand effects. There are common drivers of labour market movements in Australia and New Zealand, and these common drivers mean that the Australian and New Zealand unemployment rates typically co-move. A high Australian unemployment rate is reflected in higher unemployment in New Zealand, but also high net immigration.

6 Conclusion

This paper shows that a large migrant inflow can be associated with different impacts on the New Zealand economy. Net immigration seems to respond to labour market differentials here

and abroad.

We show that an increase in net immigration due to a high Australian unemployment rate can be associated with higher unemployment in New Zealand. By contrast, an exogenous boost to immigration (i.e. a surge of migrants for reasons other than labour market differentials) is associated with lower unemployment.

Through the lens of this model, the migration cycle of the mid-2000s occurred for exogenous reasons and this pushed down the unemployment rate. By contrast the current migration cycle is best characterised as an endogenous response to a high unemployment rate in Australia. The macroeconomic impact of the high Australia unemployment rate is reflected in high net PLT immigration, and also a higher New Zealand unemployment rate than would otherwise be the case. This is one way to reconcile why the unemployment response in the current cycles is different to the unemployment response of the mid-2000s cycle.

REFERENCES

Coleman, A. and Landon-Lane, J. (2007). Housing Markets and Migration in New Zealand, 1962-2006. Reserve Bank of New Zealand Discussion Paper series DP2007/12, Reserve Bank of New Zealand.

Gorbey, S., James, D., and Poot, J. (1999). Population Forecasting with Endogenous Migration: An Application to Trans-Tasman Migration. *International Regional Science Review*, 22(1):69–101.

McDonald, C. (2013). Migration and the housing market. Reserve Bank of New Zealand Analytical Notes series AN2013/10, Reserve Bank of New Zealand.

Silverstone, B. and Bell, W. (2011). Gross Labour Market Flows in New Zealand: Some Questions and Answers. Working Papers in Economics 11/15, University of Waikato, Department of Economics.

Statistics New Zealand (2010). New Zealand's International Migration Statistics: 1922-2009. Technical report, Wellington.

Vehbi, T. (2016). The Macroeconomic Impact of the Age Composition of Migration. Reserve Bank of New Zealand Analytical Notes series AN2016/XX, Reserve Bank of New Zealand.

APPENDIX A ESTIMATION RESULTS

(standard errors in parentheses)

		Aus. UR	Migration	NZ UR	Wages
	Constant	−0.002	−0.037	−0.479	0.228
		(0.018)	(0.043)	(0.236)	(0.072)
Lag 1	Aus. UR	1.292	0.092	−0.105	−0.113
		(0.105)	(0.033)	(0.177)	(0.054)
	Migration	0	0.941	−0.038	0.146
		–	(0.105)	(0.570)	(0.175)
	NZ UR	0	−0.022	0.587	0.022
		–	(0.019)	(0.105)	(0.032)
	Wages	0	0.003	1.235	0.394
		–	(0.063)	(0.343)	(0.105)
Lag 2	Aus. UR	−0.226	−0.091	0.329	−0.048
		(0.176)	(0.055)	(0.293)	(0.090)
	Migration	0	0.102	1.290	−0.138
		–	(0.137)	(0.747)	(0.229)
	NZ UR	0	0.025	0.014	0.017
		–	(0.022)	(0.118)	(0.036)
	Wages	0	0.142	−0.377	0.258
		–	(0.068)	(0.371)	(0.114)
Lag 3	Aus. UR	−0.212	0.049	−0.284	0.184
		(0.178)	(0.055)	(0.294)	(0.090)
	Migration	0	−0.157	−1.000	−0.111
		–	(0.140)	(0.762)	(0.234)
	NZ UR	0	−0.007	0.034	0.065
		–	(0.022)	(0.118)	(0.036)
	Wages	0	−0.028	0.963	0.049
		–	(0.071)	(0.387)	(0.119)
Lag 4	Aus. UR	0.074	−0.026	0.058	−0.119
		(0.101)	(0.033)	(0.179)	(0.055)
	Migration	0	0.002	−0.004	0.264
		–	(0.106)	(0.574)	(0.176)
	NZ UR	0	−0.033	−0.054	−0.073
		–	(0.018)	(0.099)	(0.030)
	Wages	0	−0.010	−0.927	−0.188
		–	(0.065)	(0.353)	(0.108)

APPENDIX B ARE TRANS-TASMAN MIGRANT FLOWS DIFFERENT TO OTHER FLOWS?

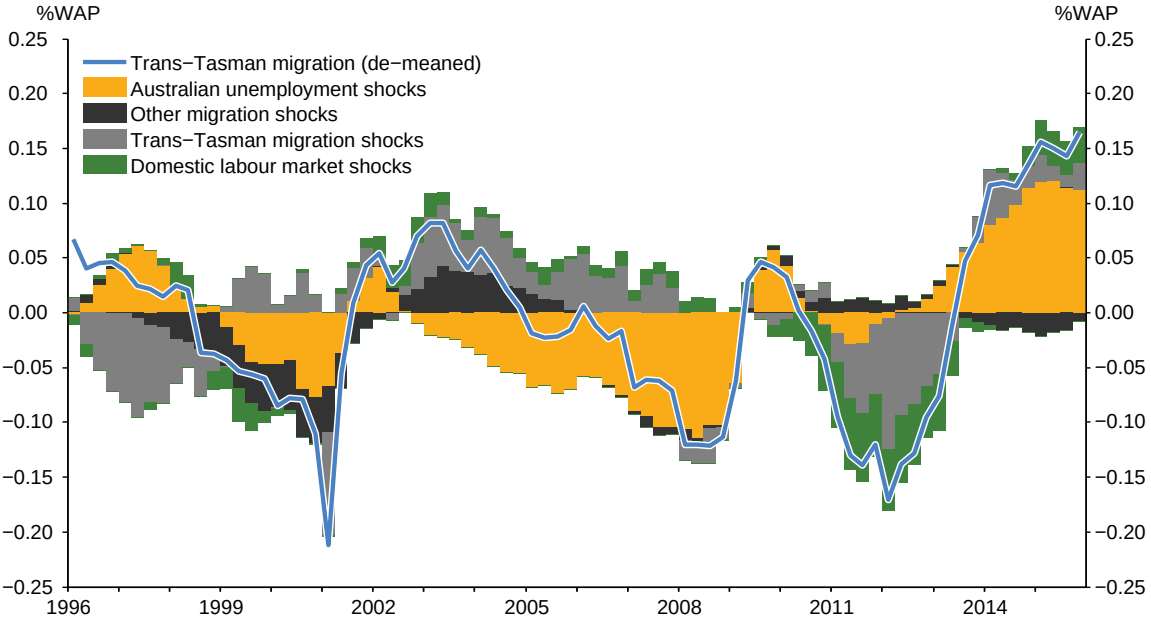
We adapted the baseline model to also identify the different drivers of net trans-Tasman immigration and net immigration to and from the rest of the world. We re-estimated the model with both net trans-Tasman immigration and net-immigration from the rest of the world in place of net PLT migration in the model. The ordering for the Cholesky identification scheme put non-trans-Tasman immigration before trans-Tasman immigration, based on the assumption that trans-Tasman flows are more endogenous than flows to and from the rest of the world. The underlying drivers are show below.

We find that trans-Tasman immigration is more fully-explained than other immigration in this model. Trans-Tasman flows are largely driven by Australian and world conditions. This makes sense given the free movement of labour between New Zealand and Australian – we would expect trans-Tasman flows to respond endogenously to relative conditions in the New Zealand and Australian labour markets.

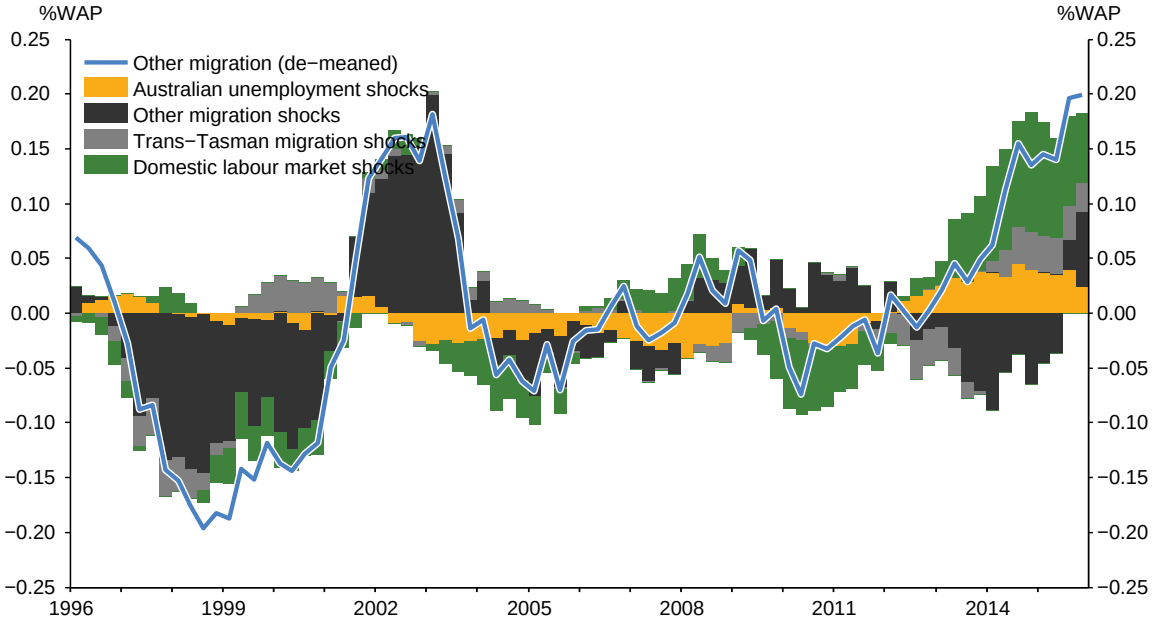
By contrast, the net immigration flows from the rest of the world are not as well explained. Domestic conditions play a role, but conditions in Australian have only a small impact. As such, the flows often deviate from what would be expected given the other variables, resulting in large migration shocks over history. Even including an indicator of global labour market conditions does not fully explain the increase in net immigration in 2002/03.

Drivers of migration flows by region

Trans-Tasman migration

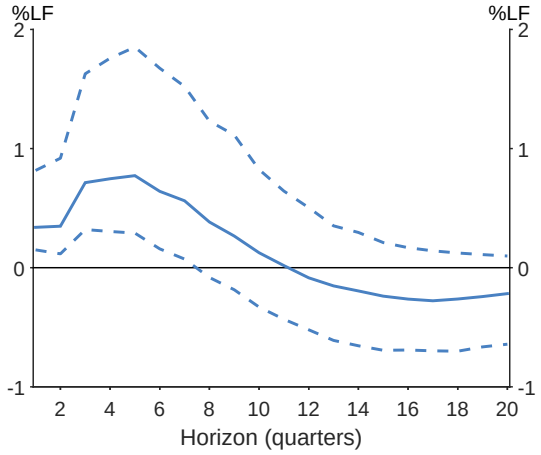


Other migration

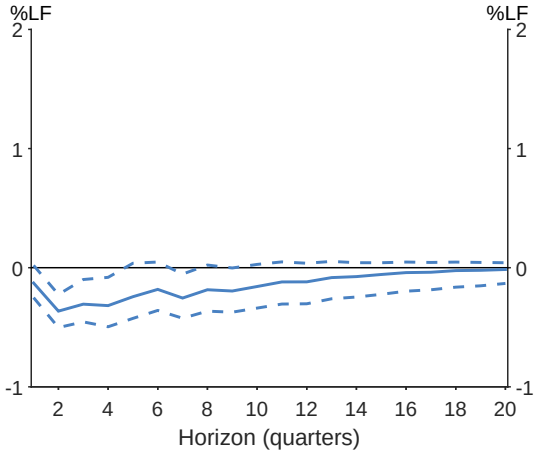


APPENDIX C MODEL IMPULSE RESPONSES FOR UNEMP. RATE (TOTAL MIG.)

Australian unemployment shock



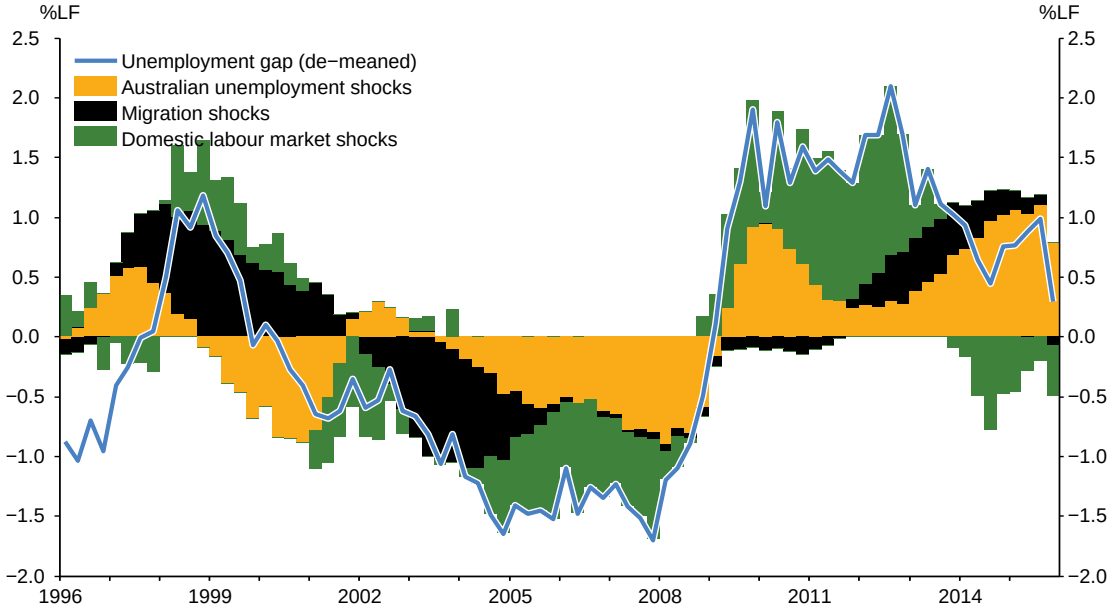
Migration shock



APPENDIX D SHOCK DECOMPOSITIONS FOR UNEMPLOYMENT AND WAGES

The SVAR framework we use also allows us to decompose the drivers of the unemployment rate and wage inflation over recent history. These drivers are consistent with our interpretation of the Australian unemployment shock and the migration shock above. Namely, the high Australian unemployment rate at present is being reflected in an above-trend New Zealand unemployment rate, and below-trend wage inflation. By contrast, the migration shocks of the mid-2000s lowered the unemployment rate by about 1 percentage point.

Drivers of the unemployment rate



Drivers of wage inflation