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The macroeconomic impact of the age composition of migration

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NON-TECHNICAL SUMMARY

New Zealand is experiencing its largest inflow of net permanent and long-term (PLT) migrants in 100 years (see Armstrong and McDonald, 2016). Regarding the composition of inflows, this increase is primarily driven by arrivals aged 17-29 on student and work visas.

Unlike the 2000s migration cycle, the current migration cycle has been coincident with relatively weaker domestic demand pressures. The analysis by Armstrong and McDonald (2016) shows that the high Australian unemployment rate is the predominant driver of net immigration in the current cycle, and that this high Australian unemployment rate is also being reflected in a high New Zealand unemployment rate. In this Analytical Note, we extend their framework to assess whether the age composition of migrants is an important factor to explain why economic pressures have been weaker than expected, given strong net immigration. We argue that the current concentration of net inflows in the younger 17-29 age group suggests that the pressure on domestic economy may be weaker than expected.

To test our argument empirically, we group the migrants into two categories based on their age: those aged 17-29, and those aged 30-49. We then use an econometric model to examine whether the 17-29 group has a relatively smaller economic impact compared to the 30-49 group.

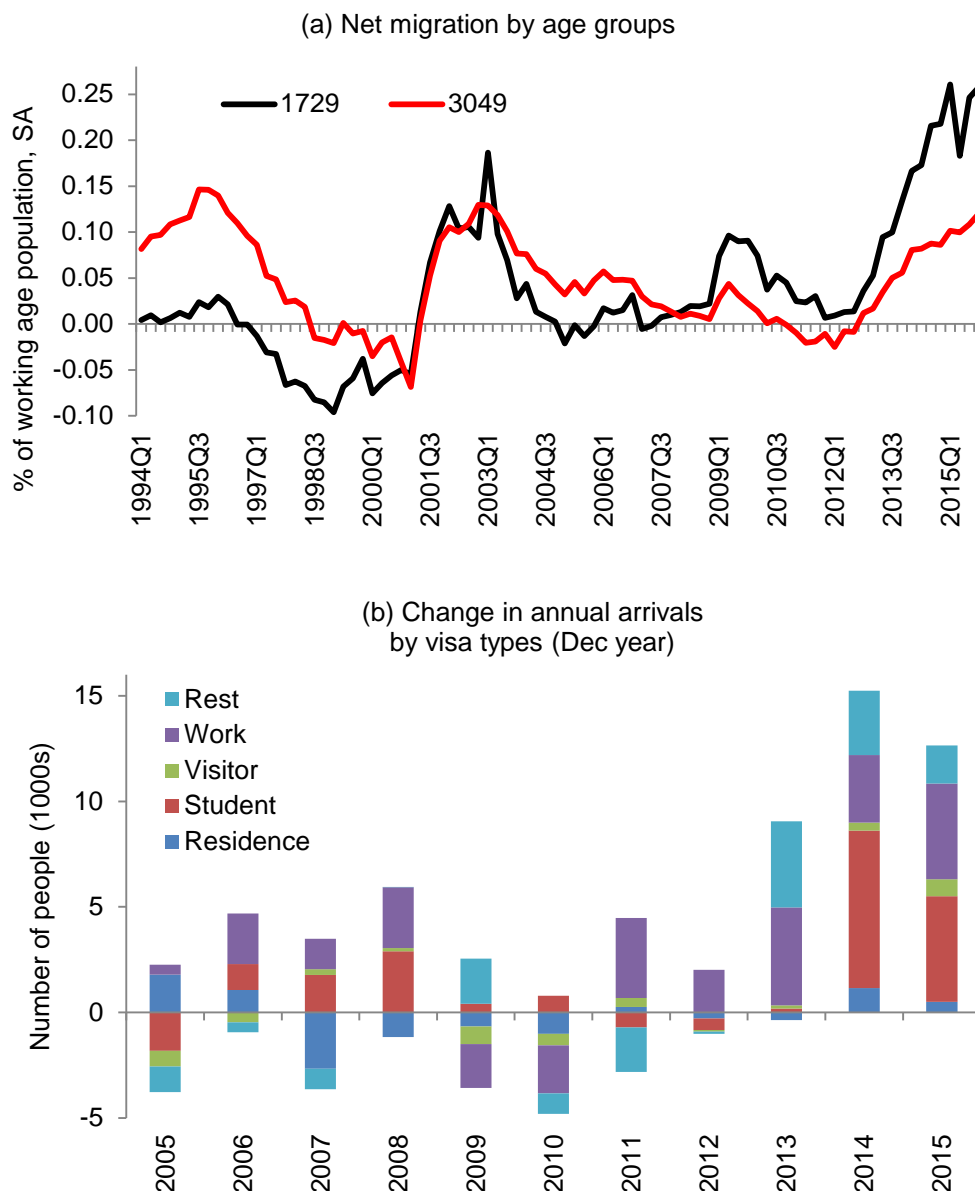
The results confirm that inflows of the 17-29 migrants, on average, have a positive but more muted economic impact than the corresponding flows of the 30-49 group. Overall, we observe significant heterogeneity in the magnitudes of the impacts of the two groups on variables such as consumption, house prices, rents, residential investment, unemployment rate (gap) and inflation. Therefore, the current concentration of net inflows in the 17-29 age group, coupled with the relative weakness of Australia's labour market, suggests that the current migration impulse may have a more subdued impact on the New Zealand economy than previous migration cycles.

The results complement the analysis by Armstrong and McDonald (2016). Both studies help to extend our understanding of migration in the current cycle, which has been associated with a smaller domestic impact than the migration cycle seen in the mid-2000s.

1 INTRODUCTION

The net inflow of migrants into New Zealand has increased significantly since 2012. This net inflow has primarily been driven by migrants aged 17-29 on student and work visas (Figure 1). The surge in student numbers coincides with immigration policy changes which came into effect in December 2013, making it easier for international students to work while studying.^{1 2}

Figure 1: Composition of migration by age groups and visa types



Surprisingly, the current migration cycle has been coincident with relatively weaker

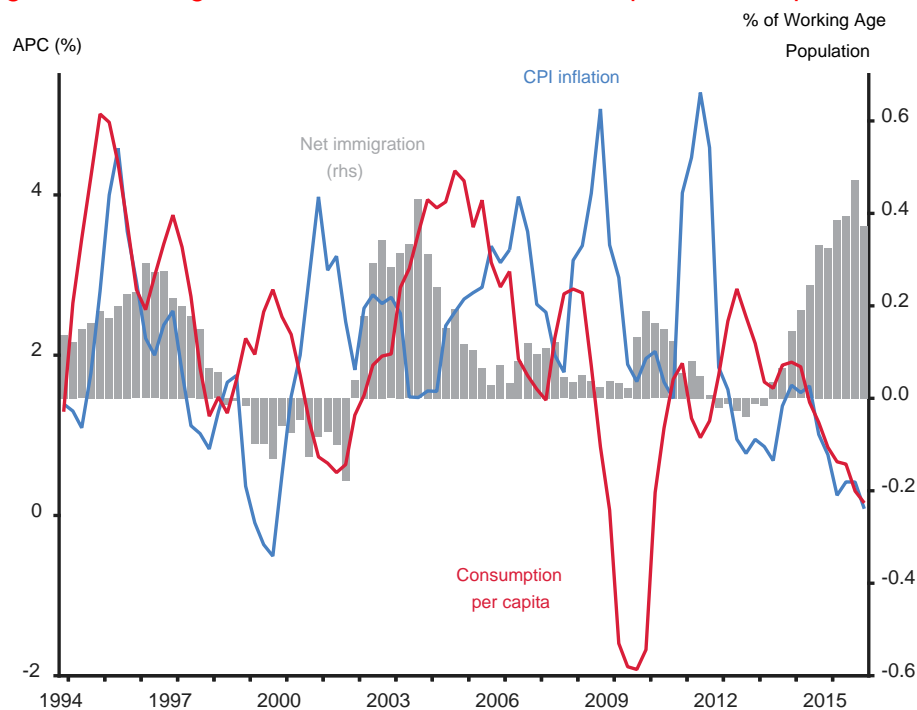
¹<http://www.immigration.govt.nz/migrant/general/generalinformation/news/internationalstudentchanges.htm>

² Students from India are currently providing the strongest contribution, accounting for 39% of total student arrivals in 2015, followed by students from China (19%) and the Philippines (7.6%) (See Figure A1 in the Appendix).

domestic demand pressures, high unemployment rate and low inflation (Figure 2). Consumption growth on a per-capita basis has been very weak particularly over 2015 despite higher house prices, strong migration and low interest rates. Armstrong and McDonald (2016) shows that the high Australian unemployment rate is the predominant driver of net immigration in the current cycle, and that this high Australian unemployment rate is also being reflected in a high New Zealand unemployment rate.

This analytical note extends the analytical framework in Armstrong and McDonald (2016) by examining whether the age profile of migrants is important when assessing the flow-on effects on domestic economy. We argue that the current concentration of net inflows in the 17-29 age group is an important factor to be considered when assessing the impact of migration on the economy.

Figure 2: Net Migration, CPI Inflation and Consumption Per Capita



To test our hypothesis, we group migrants into two categories, those aged 17-29 and those aged 30-49. We then use an econometric model to examine whether the former group has a smaller economic impact compared to the latter.

The results show that the 17-29 group has a positive but much smaller impact on the economy compared to the 30-49 group, suggesting that the age profile of migrants is an important factor when evaluating the effects of migration on the economy.

The results are consistent with the previous research conducted at the Bank showing that the extent to which New Zealand economy responds to an increase in

immigration largely depends on the composition of migrants (McDonald, 2013).³ The results also complement the findings of Armstrong and McDonald (2016) in providing an alternative explanation to help explain why demand pressures have been weaker than expected, given high net immigration. The results from both studies help to extend our understanding of the effect of migration in the current cycle.

The rest of the paper proceeds as follows. Section 2 describes our model, the data and our estimation approach. Section 3 reports the results and section 4 concludes.

2 THE MODEL AND DATA

The baseline model is a seven variable structural vector autoregression (SVAR) model which comprises the Australian unemployment rate (gap), quarterly New Zealand net permanent and long term (PLT) immigration (disaggregated into two age groups), residential investment, New Zealand unemployment rate (gap), inflation (core non-tradable from the sectoral factor model⁴), house prices, and rents in real terms (See Figure A2 in the Appendix for plots of the data). Net PLT migration data are expressed as a share of the 17-49 population. The Australian and New Zealand unemployment rates are expressed as deviations from their respective trends where the trends are estimated using an HP filter.⁵ Inflation, house prices, rents and residential investment data are converted into annual growth rates.

We estimate the baseline version for each migration group separately to isolate the two types of migration shocks and use a recursive (ie Cholesky) identification scheme to identify the exogenous changes to net migration that we are interested in. Therefore, we identify two separate migration shocks representing exogenous increases in the inflow of 17-29 and 30-49 migrants. The model is an extended version of the model used in Armstrong and McDonald (2016) and the identification closely follows the assumptions used in their paper. In particular, we assume that:

- The Australian labour market is not impacted by either New Zealand's PLT immigration or by the New Zealand labour market. We assume that that New Zealand is too small to meaningfully impact the Australian labour market.
- Migration is not contemporaneously affected by the New Zealand labour market since it takes some time to move to or from New Zealand.
- Residential investment responds to changes in net migration only with a quarter lag given that it takes time to plan the investment and obtain the necessary building permits.
- Consumption, house prices, rents and inflation are allowed to respond to net migration in the same quarter. Our assumption about house prices and rents reflects the fact that housing supply is largely fixed in the near-term.

³ The New Zealand Treasury also has related analysis on this issue that qualitatively examines the composition of the current migration cycle using disaggregated permanent and long term (PLT) migration data (see Treasury Monthly Economic Report, 2015).

⁴ See Price (2013) for details on the sectoral factor model.

⁵ Smoothing parameter (λ) and the long-run steady state values are set to 80000 and 5 percent respectively.

We estimate the model using a Bayesian approach. Prior information on the reduced-form coefficients is incorporated via dummy observations.⁶ The sample period goes from 1994:1 to 2015:2 on a quarterly basis and the VAR includes four lags of each variable.

We analyse the dynamics of the model using impulse response functions and forecast error variance decompositions. As robustness checks, we estimate the model using a different sample size (ie using the period prior to the December 2013 immigration policy change) and apply a different variable ordering (ie net migration is ordered last), and we then recalculate the corresponding impulse responses. The robustness results are reported in the Appendix and do not change the overall findings.

3 RESULTS

Figure 3 shows the impulse responses to an exogenous net migration shock disaggregated by the two age groups. The shocks are scaled to generate an approximately one percent boost to the 17-49 population over a five-year period.

The estimated impulse responses are broadly consistent with the effect of the migration shock from previous macro-data based studies (McDonald, 2013, Coleman and Lane, 2007). Overall, an exogenous increase in net migration significantly raises the aggregate level of private consumption and residential construction, lowers the unemployment rate, and puts upward pressure on house prices and rents. However, we observe significant heterogeneity in the magnitudes of the impulse responses of the two groups, despite the similarity regarding their persistence:

- An exogenous increase in migration of 17-29 migrants lowers the unemployment gap by about 0.1 percent.
- A similar-sized migration shock of the 30-49 group would reduce the unemployment rate by about 0.3 percent.
- In the case of 17-29 migrants, the fall in unemployment is relatively delayed and starts approximately a year after the initial shock.

Both migration shocks exert a significant impact on house prices and rents, which is perhaps not surprising given that the housing supply is largely fixed in the short run. The magnitude of the impact on house prices and rents from both groups are similar within the first four quarters after the shock. The impact coming from the 30-49 group, however, is more pronounced in the medium term. Similarly, we find that residential investment increases in the medium-term albeit at a slower pace in the case of 17-29 migrants.

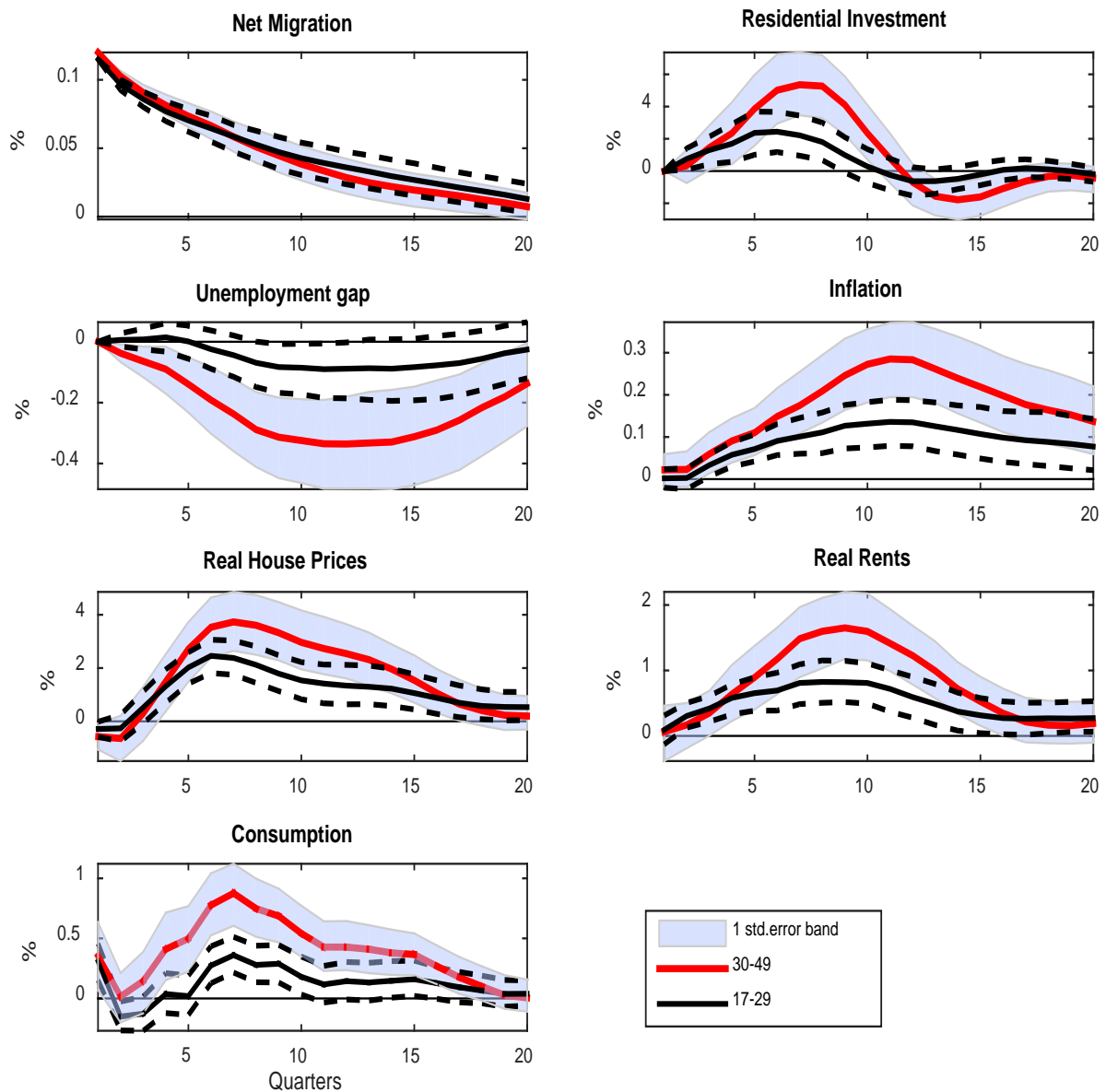
Not surprisingly, both types of migration shocks lead to an increase in the level of consumption, although an exogenous boost to the migration of 17-29 migrants is associated with much weaker consumption growth than that of 30-49 migrants.

⁶We impose fairly loose Minnesota priors (see Doan et al.) which reflect the assumption that all the variables are stationary. For robustness, we also consider the case that all the variables follow a random walk and obtain similar results.

We also find that the response of inflation to an increase in both types of migrants is positive and significant. However, the 17-29 group have a smaller impact on inflation relative to the 30-49 group.

Overall, the results highlight that the age profile of migrants is an important factor when assessing the effects of migration on the domestic economy.

Figure 3: Impulse responses to a net migration shock



What is the relative importance of migration shocks?

The impulse responses presented above provide a useful way to assess the signs and magnitudes of responses to two types of migration shocks. We can further gauge the relative importance of the two types of migration shocks using forecast error variance decompositions (FEVD). FEVDs measure the percentage share of the variation in the forecast error due to a specific shock at a particular time horizon.

Figure 4 displays the forecast error variance decomposition of the model variables with respect to the two types of migration shocks over a four-year horizon.

For inflation, the decomposition suggests that shocks attributed to 30-49 and 17-29 migrants can account for up to approximately 12 and 6 percent of the forecast error variance decompositions of New Zealand's inflation within four years after the shock, respectively. While the shock attributed to 30-49 migrants contributes to around 6 percent of the forecast error variance of New Zealand's unemployment gap, the contribution of the 17-29 group is very small.

The contributions of the 17-29 and 30-49 groups explain around 8 and 13 percent of the variation in house prices and 5 and 9 percent of the variation in rents at the four-year horizon respectively. We observe a similar pattern in rents where the corresponding contributions are more subdued.

The contribution of the 30-49 year old migrants to explaining the variation in consumption rises over time reaching 7 percent at the 16 quarter horizon. The corresponding increase in the contribution of young-age migrants is relatively smaller (2 percent) and more uniform throughout the forecast horizon.

Finally, we observe a similar pattern in the residential investment where the contribution of the 17-29 and 30-49 group migrants explain, respectively, around 2 and 4 percent of the variation in residential investment at the end of the forecast horizon. Overall, the results show that the shares attributable to migration shocks of the 30-49 group are generally larger than that of the younger age group. However, the contributions of both types of migration shocks in explaining the variations in the forecast errors of the model variables are relatively small.

To shed more light on the drivers of the variation in the forecast errors, we also examine the forecast error variance decompositions of the model variables with respect to the Australian unemployment gap shock.⁷ The results (not reported) indicate that shocks to Australian unemployment gap have relatively similar contributions to variations in inflation, house prices and rents in New Zealand and can explain a sizeable proportion of the variation in the New Zealand unemployment gap (approximately 30 percent over a four-year horizon). These findings are consistent with the results of Armstrong and McDonald (2016) in showing that the high Australian unemployment rate has material implications for the New Zealand unemployment rate.

⁷ Results are available upon request.

Figure 4: Forecast Error Variance Decompositions



4 CONCLUSION

New Zealand is experiencing a large inflow of net permanent and long-term (PLT) migrants, primarily driven by arrivals aged 17-29 on student and work visas. Surprisingly, the current migration cycle has been characterised by relatively weaker economic pressures and has been associated with lower inflation outcomes when compared to earlier cycles..

This analytical note examines whether the age profile of migrants is important when assessing the flow-on effects on domestic economy using a structural vector autoregression model. Impulse responses and forecast error variance decompositions from the model show that while both 17-29 and 30-49 group migrants have significant positive impact on domestic variables, the effect coming from the former is relatively more subdued.

The results complement the findings of Armstrong and McDonald (2016) which provide an alternative explanation for the muted domestic impact of the recent cycle in migration. Their work shows that the high Australian unemployment rate is the

predominant driver of net immigration in the current cycle, and that the high Australian unemployment rate is also being reflected in a high New Zealand unemployment rate.

Both studies help to extend our understanding of the drivers and impact of migration in the current cycle and provide alternative explanations as to why this cycle may be different to the previous ones. Coupled with the relative economic weakness in Australia's labour market, the current concentration of net inflows in the 17-29 age group suggests that the growth in domestic demand may be weaker relative to past migration cycles.

It is important to note that immigration is a complex phenomenon that affects the New Zealand economy through various channels (Cochrane and Poot, 2004). Further research, particularly on the supply-side impacts of migration, would be useful to shed more light on the economic impact of migration in New Zealand.

REFERENCES

Armstrong, J. and McDonald, C. (2016). Why the Drivers of Migration Matter for the Labour Market. Reserve Bank of New Zealand Analytical Notes series AN2016/02, Reserve Bank of New Zealand.

Cochrane, B. and Poot, J. (2004). Measuring the Economic Impact of Immigration: A Scoping Paper, MBIE.

<<http://www.mbie.govt.nz/publications-research/research/migrants---economic-impacts/ScopingpaperontheEconomicImpactsofImmigration.pdf>>.

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.

Doan, T. and Litterman, R. and Sims C. (1984). Forecasting and Conditional Projection Using Realistic Prior distributions, *Econometric Reviews* 3: 1-100.

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

New Zealand Treasury, Monthly Economic Report (February, 2015). <<http://www.treasury.govt.nz/economy/mei/archive/pdfs/mei-feb15.pdf>>.

Price, G. (2013). Some revisions to the sectoral factor model of core inflation. Reserve Bank of New Zealand Analytical Notes series AN2013/06, Reserve Bank of New Zealand.

Appendix

Figure A1: Student Arrivals (annual)

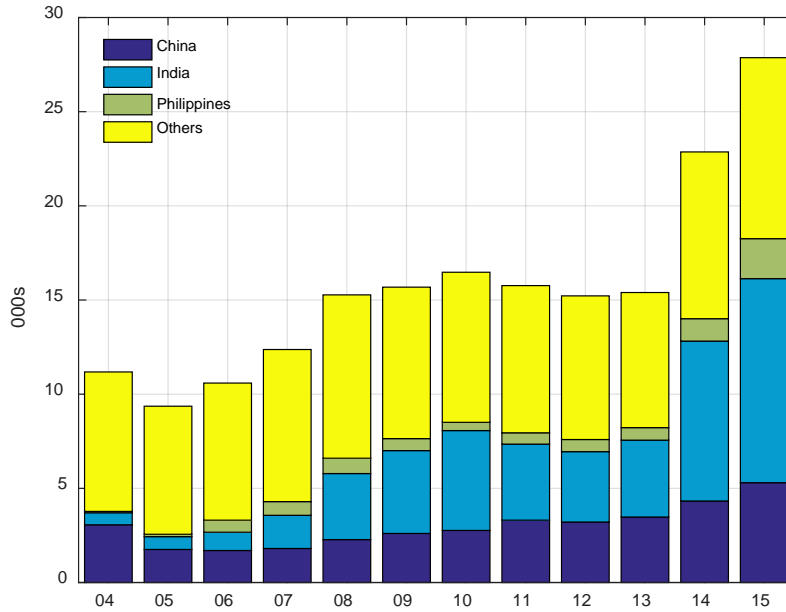
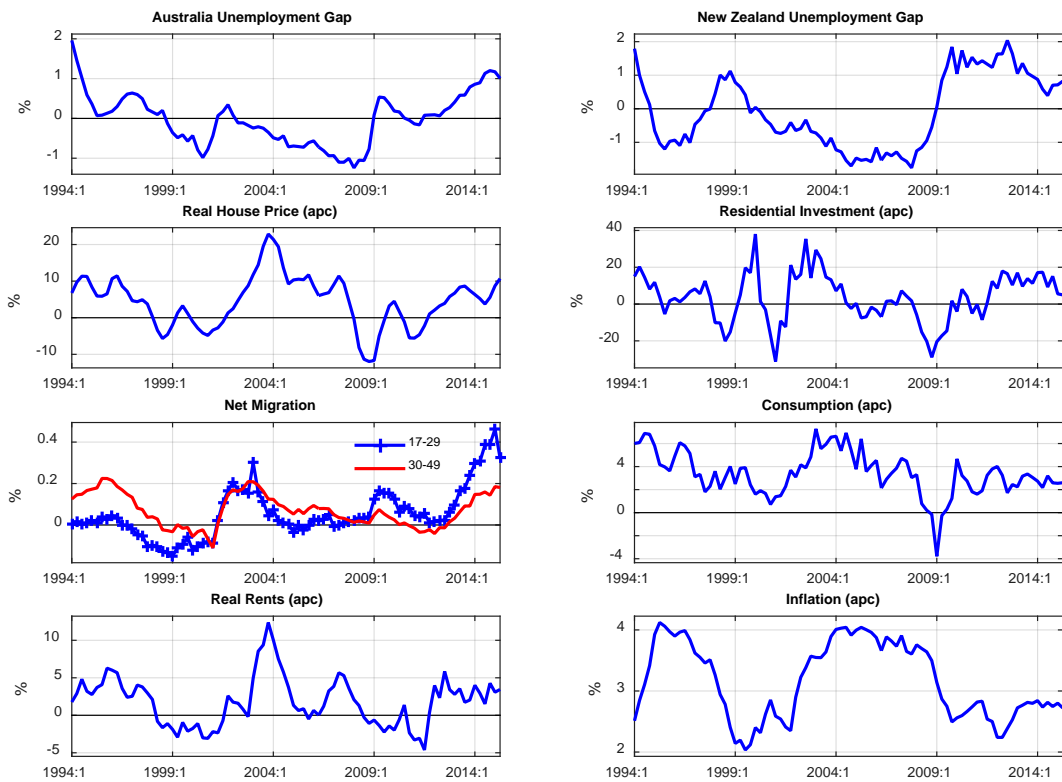


Figure A2: Model Variables



Robustness

We examine the robustness of our findings by estimating the model over different sample periods and by using different identification assumptions.

First, we check whether the results are sensitive to the inclusion of the recent boom in net migration. To this end, we estimate the model for the period 1994:1–2013:4 which corresponds to the period prior to the implementation of immigration policy changes. Results shown in Figure A3 are qualitatively similar.

Second, we check the sensitivity of our results to the specific identification assumption we use to identify the migration shock. Figure A4 shows the results when net migration is ordered as the last variable in the recursive ordering. Again, the results are qualitatively similar.

Figure A3: Model estimated over the sample 1994:1–2013:4

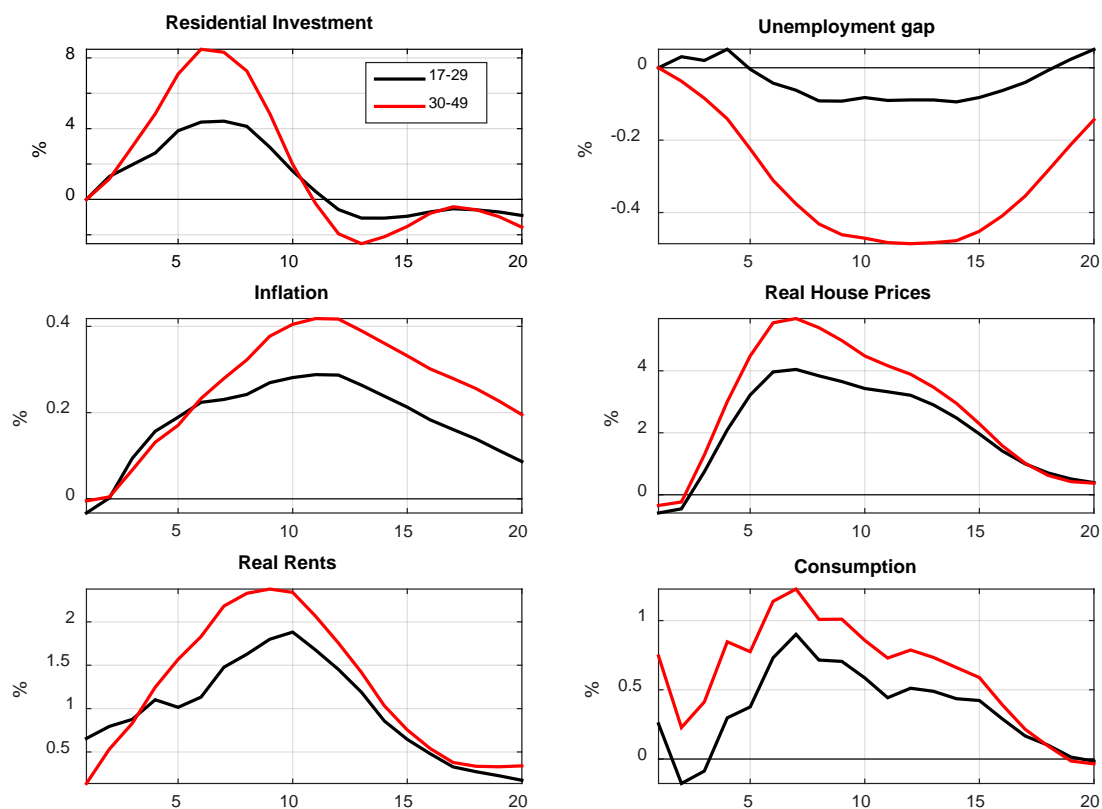


Figure A4: Alternative recursive ordering (migration variable is ordered last)

